50th Annual Perry V. Halushka MUSC Research Day

November 12-13, 2015

Medical College of South Carolina

THIRD ANNUAL STUDENT RESEARCH COMPETITION

APRIL 9, 1968

10:00 a.m. — 12:30 p.m.

BARUCH AUDITORIUM

Committee on Student Research Seminar

Dr. Maria Buse, Chairman
Mrs. Vera C. Hyman, Student Representative
Dr. Charles D. Graber
Dr. Max Rittenbury
Dr. Arthur V. Williams
Dr. Curtis W. Worthington

PROGRAM

Moderator - Dr. Maria Buse

come — Dr. Louis P. Jervey, Associate Dean

Sulfated Mucosubstance and Basic Protein in Human Granulocytes"
Mr. William Burwell Dunn
Junior Class
Sponsor: Dr. Samuel S. Spicer

"Orthostatic Hypotension"
Mr. Charles E. Huggins
Junior Class
Sponsor: Dr. O. Rhett Talbert

"Compensatory Renal Hyperplasia in the Golde Syrian Hamster"
Mr. Paul B. Pritchard, III
Junior Class
Sponsor: Dr. Gordon R. Hennigar

40 "The Effects of a High Fat Diet on C^{14} L Incorporation Into Proteins In Vivo"
Mr. Vasa W. Cate
Sophomore Class
Sponsor: Dr. Maria Buse

10:55 "Fate of Injected ^{14}C-Hydroxyethyl Starc
Mr. Richard K. Bogan
Sophomore Class
Sponsor: Dr. R. P. Walton

11:10 10 Minute Intermission

11:20 "The People View Health Proble
Mr. Bernard W. Deas, Jr.
Sophomore Class
Sponsor: Dr. John F. Finkle

11:35 "Hyperuricemia During Furosemide
Mr. Harry W. Floyd
Senior Class
Sponsor: Dr. Brian Smith

"Cell Type Correlation, Classification, protein Characterization in Human Adenol Mucoid Cells"
Mr. Robert F. Phifer
Junior Class

Sigma Xi, The Charleston Chapter

WANTS YOU TO JOIN AS A NEW MEMBER OR AS A RENEWED MEMBER

Please consider joining the Charleston Chapter of Sigma Xi. Sigma Xi, The Scientific Research Society, is the international society of science and engineering. In addition to all of the national and international efforts of the Society, your membership will afford you immediate local benefits. The Charleston Chapter is one of the few that is not affiliated with a single University, with members from the Medical University of South Carolina, The College of Charleston, The Citadel, Trident Tech, Bayer Corporation, NOAA, and SCDNR. Membership in the Charleston Chapter brings you into immediate contact with scientists from all disciplines and in all work environments in our area.

Please consider nominating yourself for membership or renewing your membership and then enjoy the benefits:

- **Subscription to the *American Scientist***. The American Scientist, published bimonthly since 1913, contains articles to inform scientists and engineers about developments outside of their own fields.
- **Grants-in-Aid of Research**. Small grants to encourage the professional development of new scientists.
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- **Support of Charleston Area Undergraduate and Graduate Research**. Our Chapter sponsors awards for Outstanding Research Presentations by students at MUSC's Student Research Day, CofC's Marine Biology Colloquium, The Citadel's Undergraduate Research Conference and the Annual Meeting of the South Carolina Academy of Sciences.
- **Local Professional Talks**. Throughout the year our Chapter sponsors research seminars and field activities featuring our own members and the broad range of scientific disciplines in which they are engaged.
- **National Speakers**. At least once a year, we bring in a Sigma Xi National speaker. In recent years, the visit of our National speaker has been the highlight of "Darwin Week" – a week-long seminar series in February to celebrate Darwin's birthday.
- **Annual Banquet**. Once a year, each spring, we recognize the outstanding accomplishments of scientists and teachers in our Chapter and we have a keynote address of particular scientific or policy interest to the members of our Chapter.
- **Chapter Listserver.** Our chapter sponsors Chs-Sci-Net, the best way to stay informed about all manner of science activities in the Lowcountry and throughout South Carolina.

To join, complete the nomination form available at: http://www.sigmaxi.org/member/join/nom.html. We can provide nomination signatures if you do not know other Sigma Xi members.
New member dues: $90 (students $25) + one time $20 initiation fee (chapter dues waived).
Transitional dues for recent graduates (e.g. postdocs): $45.00 + $20 initiation fee.

Send the completed form to:
Dr. Karen Burnett, Membership Chair
Charleston Chapter of Sigma Xi
Hollings Marine Laboratory
331 Fort Johnson Road
Charleston, SC 29412
Phone: 843-725-4826
E-mail: burnettk@cofc.edu

Questions? Contact
Dr. Holly Bevsek, President
Charleston Chapter of Sigma Xi
Department of Chemistry
The Citadel
171 Moultrie Street
Charleston, SC, 29409
Phone: 843-953-7790; E-mail: bevsekh1@citadel.edu

MUSC Research Day 2015 – SCHEDULE

THURSDAY, NOVEMBER 12th 4:00 pm BEB 110 – Keynote Address

"Thromboxane A2 and TP Receptors: A Trail of Research Well Traveled"

FRIDAY, NOVEMBER 13th – Research Presentations

POSTERS: **Harper Wellness Center Gym, 8:30 am – 11:30 am**

ORALS: **Colbert Education Center and Library – First Floor Rooms**

Schedule of Oral Sessions: = Break in session

Room		11:00 am	12:00 pm	1:00	2:00	3:00	4:00
EL 116	Session 11				Undergraduate II		
EL 103	Session 12		Clinical / Professional / Masters V				
EL 102	Session 13		Clinical / Professional / Masters VI				
EL 114	Session 14		Clinical / Professional / Masters VII				
EL 118	Session 15				PhD IV		
EL 107	Session 16		PhD V				
EL 115	Session 17		PhD VI				
EL 109	Session 18		PhD VII				
EL 121	Session 19		Postdoc / Resident / Fellow / Staff Scientist II				
EL 113	Session 20		Postdoc / Resident / Fellow / Staff Scientist III				

= Break in session

ACKNOWLEDGEMENTS

The Perry V. Halushka Research Day Endowment

In 2006, in recognition of the many years of service given by their father, Dr. Perry V. Halushka, to the Medical University, Francine Halushka Katz, Marc Halushka, M.D., Ph.D., and Suzanne Friedman and their families have established, through the MUSC Foundation, **The Dr. Perry V. Halushka Research Day Endowment.** This endowment will help to support the activities of Student Research Day in perpetuity. Specifically, the endowment will enable the University to:

- Provide monetary awards for outstanding research presentations
- Attract world-class scientists as guest keynote speakers
- Provide funds to support the annual MUSC Research Day event

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The MUSC Research Day Committee

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Rachel Weber	College of Graduate Studies, Student Representative

INFORMATION FOR PARTICIPANTS

Poster Presentation Sessions:

Poster sessions will be held in the Harper Student Center Gym. You are encouraged to view the posters currently on display on the walls of the Basic Science Building and at other locations around campus for examples of poster layout, design and size. For assistance with poster design and content, contact the MUSC Center for Academic Excellence. Most poster support boards are approximately 3' 6" tall by 5' 6" wide. Poster support boards will be available by 7:30 am on Friday, November 13th, with numbers corresponding to the abstract numbers in this program. Posters should be in place by 8:30 am and should remain in place until 11:30 noon. The times indicated for your session in the program are the times we expect that the judges will be in attendance. Do not remove your poster before 11:30 noon. If you have a scheduling conflict and can only be in attendance at your poster for a specific time, please let the Research Day 2015 Chairman, Dr Steven Kubalak, know immediately. You will have **10 minutes** to present the information on your poster to the judges – the judges will also ask you questions and will tell you when they have completed evaluating your poster. **Please note you will have 3 judges for the regular sessions visit your poster – they may visit all together, in pairs, or they may come one at a time. Judges for the regular sessions will be wearing red nametags. Please do not leave your poster until you have presented it to all three regular session judges**. Special session judges are in addition to the regular session judges.

Oral Presentation Sessions:

Most of the oral sessions will be in the **Colbert Education Center and Library** in several rooms on the first floor. Sessions will take place in the 1st floor lecture rooms: please check the program for specific room assignments. Computer projection using a PC platform will be available. You can either save your presentation on a CD, to your homeroom or on a memory stick. Ensure that your presentation loads and runs correctly before you save it. Download your presentation to the desktop of the computer in the room where you will be presenting; do this **BEFORE** the start time of your session on Friday, November 13th. Oral presentation time slots are 15 minutes. An oral presentation should last **10 minutes** with the remaining time for questions. The 15-minute time slot will be strictly adhered to by the session judges – you will receive a warning at minus 3 minutes. Remember that question handling is one of the criteria being evaluated and if you leave no time for questions, you will lose points.

Judging:

Teams of 3 judges will evaluate presentations in each of the sessions. Judges will be wearing red nametags. Presentations will be scored on a scale of 1 to 10 in ten categories covering the areas a) scientific approach to the subject of the research, b) clarity and quality of delivery, and c) handling of questions. The scores for the ten categories (max 100 points) from each judge in that session will be used to compute a ranked score. 1st and 2nd place prizes will be awarded to the presentations with the highest and next highest mean ranked scores respectively. We have tried to assign judges so as to avoid possible conflicts of interest. If, however, there is a conflict, then the judge affected will not score that presentation. Scores and evaluation sheets will be available to presenters after 4:00 pm on Friday, November 20 in the Graduate Studies office on the 1st floor of the Bioengineering Building. Any evaluation sheets not collected after two weeks will not be kept. The exception to this is for those who are not located on campus in Charleston. In those cases, please let the CGS office know and score sheets will be mailed to the address you gave when submitting your abstract. Please note, there will also be a team of judges selecting presentations for prizes in the following categories: Sigma Xi, Interprofessional Research, Ralph H Johnson VA Research, Health Disparities, Innovation, and Ethics Award - these judges will be operating as separate teams, and if your presentation qualifies for one of these categories you will be visited by these additional judges.

Breaks:

Coffee, doughnuts and soft drinks will be available from 9:30 am – 11:30 pm in the Harper Center Gym. There will be a MUSC-catered lunch for presenters and other student attendees in the Harper Center Gym at 11:00 am.

Awards Ceremony:

The Awards Ceremony will begin at 4:30 pm in the Bioengineering Building Auditorium (Rm 110). In each session there will be a 1st place prize of $500 and a 2nd place prize of $200. The special awards listed above have their own cash prizes that are in addition to the regular session prizes.

Door prizes, as part of the Thursday Vendor Show will also be awarded – for further information and for your door prize ticket, see the individual exhibitors tables at the Vendor Show. Several door prize drawings will occur throughout the Vendor Show and you must be present to win.

Poster and Oral Presentation Program

Friday November 13, 2015

POSTER PRESENTATIONS

Harper Wellness Center Gym

8:30 am - 11:30 noon

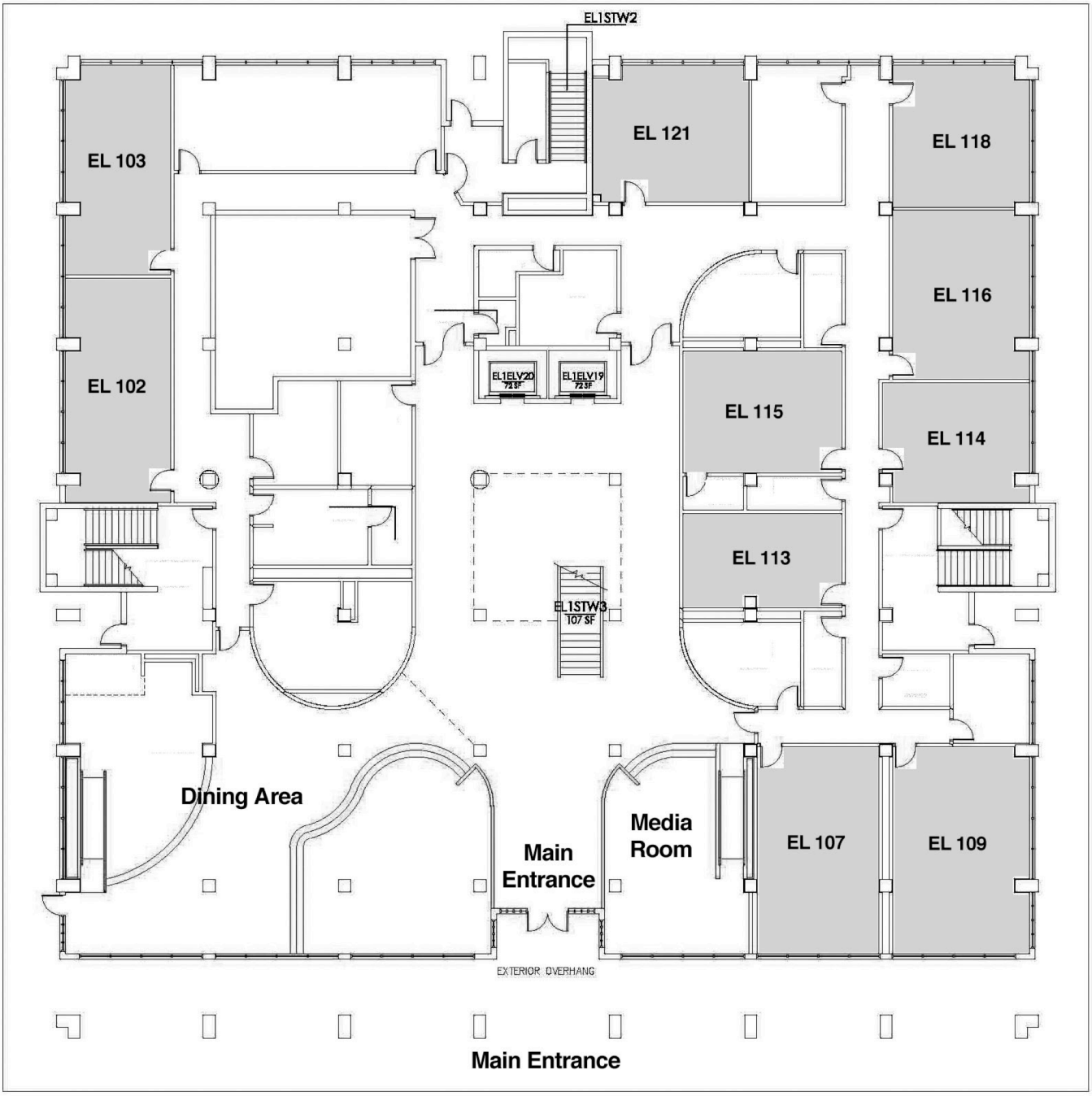
Session 1:	Undergraduate – I	#001-008
Session 2:	Clinical / Professional / Masters – I	#009-032
Session 3:	Clinical / Professional / Masters – II	#033-056
Session 4:	Clinical / Professional / Masters – III	#057-079
Session 5:	Clinical / Professional / Masters – IV	#080-103
Session 6:	PhD – I Years 1-2	#104-118
Session 7:	PhD – II Years 1-2	#119-131
Session 8:	PhD – III Years 3+	#132-157
Session 9:	Postdoc / Resident / Fellow / Staff Scientist – I	#158-182
Session 10:	Research Specialist / Technician – I	#183-191

ORAL PRESENTATIONS

Colbert Education Center and Library

Session 11:	Undergraduate – II	EL 116	1:15-3:00	#191-197
Session 12:	Clinical / Professional / Masters – V	EL 103	12:00-3:00	#198-208
Session 13:	Clinical / Professional / Masters – VI	EL 102	12:00-2:45	#209-218
Session 14:	Clinical / Professional / Masters – VII	EL 114	12:00-2:15	#219-226
Session 15:	PhD – IV Years 1-2	EL 118	1:15-3:15	#227-233
Session 16:	PhD – V Years 3+	EL 107	12:00-3:00	#234-244
Session 17:	PhD – VI Years 3+	EL 115	12:00-2:45	#245-254
Session 18:	PhD – VII Years 3+	EL 109	12:00-3:00	#255-265
Session 19:	Postdoc / Res / Fellow / Staff Sci – II	EL 121	12:00-2:45	#266-275
Session 20:	Postdoc / Res / Fellow / Staff Sci – III	EL 113	12:00-2:30	#276-284

LOCATION OF ORAL PRESENTATIONS



JAMES W. COLBERT EDUCATION CENTER & LIBRARY

FIRST FLOOR PLAN

HORSESHOE SIDE OF BUILDING

Vendor Show

The Perry V. Halushka
MUSC 2015 Research Day

Bioengineering Building Atrium
1:30 - 3:30 PM, Thursday, November 12, 2015

Register for the annual Research Day Raffle for great prizes
Top prizes are $50 BEST BUY Gift Cards

Fisher Scientific

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POSTER PRESENTATIONS Harper Center Gym: 8:30 – 11:30 am

Session 1: Undergraduate I

001 Isolation and Identification of Pseudomonas Aeruginosa Bacteriophages From Sewage, Conor W Templeton[1], Darren J Wray[2], Natasha J Sharp[2], David A Schofield[2]; [1]MUSC, [2]Guild BioSciences.

002 A Role for the Extracellular Matrix Protease ADAMTS5 in Cardiovascular Development, Lockett Nelson[1], Sarah Thibaudeau[2], Loren Dupuis[2], Christine B Kern[2]; [1]Biology, CofC, [2]Regenerative Medicine and Cell Biology, MUSC.

003 The Neurovascular Effect of Type 2 Diabetes Mellitus on Alzheimer's Disease, Sarah A Harrill[1], David Hartmann[2]; [1]CofC, [2]MUSC.

004 Developmental Compound E61 Overcomes Proteasome Inhibitor Resistance in Multiple Myeloma and Mantle Cell Lymphoma Cells, Brittany Smith[1], Leticia Reyes[2], Jesse McGlure[2], James Chou[3], Nathan Dolloff[2]; [1]College of Charleston, [2]Cell and Molecular Pharmacology & Experimental Therapeutics, MUSC, [3]Pharmacy, MUSC.

005 TGFβ1 Regulates Hyaluronan Receptor CD44v6 Through EGR1 in Lung Myofibroblasts, William C Dowling[1], Ilia Atanelishvili[2], Vincent C Hascall[3], Shibnath Ghatak[4], Suniti Misra[4]; [1]Biology, College of Charleston, [2]Medicine, MUSC, [3]Cleveland Clinic, [4]Regenerative Medicine and Cell Biology, MUSC.

006 Cell Autonomous Requirement of BMP2 in the Nfatc1 Endocardial Lineage for AV Cushion Remodeling and Mitral Valve Formation, Barton A Julie[1], Jacob Saxon[1], Travis Hawkins[1], Thomas Trusk[2], Stephen Harris[3], Bin Zhou[4], Yukiko Sugi[2]; [1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC, [3]University of Texas Health Science Center at San Antonio, [4]Albert Eistein College of Medicine.

007 Origins of Bicuspid Aortic Valve, Josh J Mifflin[1], Nic Alcala[1], Loren Dupuis[2], Christi Kern[2]; [1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC.

008 Role of Oxytocin in Alcohol Seeking Behavior, O K Roberson[1], C E King[2], W C Griffin[2], J F McGinty[2], H C Becker[2]; [1]College of Charleston, [2]Neurosciences, MUSC.

Session 2: Clinical-Professional-Masters I — Social/Behavioral Sciences

009 Predictors of Weight Perception Accuracy Among Obese Children and Adolescents, Laura E Haselden[1], Melissa Henshaw[2], Janet Carter[3], Molly Jones[3], Diane M DellaValle[4]; [1]College of Medicine, MUSC, [2]Pediatric Cardiology, Children's Hospital of South Carolina, [3]Children's Heart Health Program of South Carolina, [4]Nutrition and Dietetics, Marywood University.

010 Evaluating Internet-Based Intervention to Manage Hypertension Among African-Americans, Leah D Snipe[1], Daniel T Lackland[2]; [1]Medicine, MUSC, [2]Neurology, MUSC.

011 Culturally Sensitive Interventions for Improving Stroke Recovery Among African Americans, Kemi M Chukwuka[1], Daniel Lackland[2]; [1]College of Medicine, MUSC, [2]Neurology, MUSC.

012 Physician Attitudes and Experiences Regarding Communication with Other Specialties, Mason T Turner[1], R Neal Axon[2]; [1]College of Medicine, MUSC, [2]Ralph H Johnson VAMC.

013 Hypertension Awareness in a Hispanic Church, Carlos A Sanchez, Daniel Lackland; MUSC.

014 The Impact of Vitamin D Status on Perceived Stress During Pregnancy Among Various Racial Groups, Reona K Broadwater[1], Makeira Simmons[1], Wei Wei[2], Myla Ebeling[2], Judith Shary[2], Carol L Wagner[2]; [1]COM, MUSC, [2]Pediatrics, MUSC.

015 FLOSS - Facilitating Long-term Oral Health ServiceS, Sarah M Biggers[1], Jarvetta Heyward[1], Sam Caruso[2], Amy Martin[1], Renata Leite[1]; [1]College of Dental Medicine, MUSC, [2]Clemson University.

016 Pathways for the Relationship Between Diabetes Distress, Depression, Fatalism and Glycemic Control in Adults with Type 2 Diabetes, Christopher C Asuzu[1], Rebekah Walker[2], Joni Williams[3], Leonard Egede[3]; [1]College of Medicine, MUSC, [2]Ralph H. Johnson VAMC, [3]Center for Health Disparities Research, MUSC.

017 Correlating Early Motor Skills to White Matter Abnormalities in Preterm Infants Using Diffusion Tensor Imaging, Jordan E Tillman[1], Emma E Humphries[1], Emily A Ward[1], Patty C Coker-Bolt[1], Andrew B Barbour[2], Hunter G Moss[3], Truman R Brown[3], Dorothea D Jenkins[4]; [1]Occupational Therapy, MUSC, [2]Pediatrics, MUSC, [3]Radiology, MUSC, [4]Pediatric Neonatology, MUSC.

018 Can Muscle Groups Account for Activities of Daily Living Challenge? Clare Fitzmaurice[1], Erica Rengering[1], Emily Schoen[1], Matthew Husband[1], Christine Harris[1], Danielle Kapustka[1], Ickpyo Hong[2], Craig A Velozo[1]; [1]Occupational Therapy, MUSC, [2]Health Sciences and Research, MUSC.

019 Guided Movement and Play Program for Premature Infants (GMAPP): Engaging Families in the Early Intervention of At-risk Infants, Stephanie Bristol[1], Kathryn Hope[1], Danielle Horowitz[1], Rachel Ludovise[1], Andrew Barbour[2], Patricia Coker-Bolt[1], Dorothea Jenkins[3]; [1]Occupational Therapy, MUSC, [2]Pediatrics, MUSC, [3]Pediatric Neonatology, MUSC.

020 E-learning Innovations: Developing and Evaluating the Effectiveness of an Interactive E-learning Module, Jessica Walsh, Olivia Crabtree, Laura Richardson, Jordan Perry, Kristen Lowe, Susannah Stoughton, Sara Atkinson, Amanda Giles; Occupational Therapy, MUSC.

021 Metabolic Equivalent As an Underlying Component of Quality of Life Measures, Matthew Husband[1], Christine Harris[1], Danielle Kapustka[1], Erica Rengering[1], Emily Schoen[1], Clare Fitzmaurice[1], Ickpyo Hong[2], Craig A Velozo[1]; [1]Occupational Therapy, MUSC, [2]Health Sciences and Research, MUSC.

022 Barriers for Young, Hypertension-Prone African American Women in Home Blood Pressure Monitoring, Chelsea C Wrght, Daniel T Lackland; Neurology, MUSC.

023 Quantifying Real-World Activity and Upper-Limb Use in Children with Cerebral Palsy Using Accelerometers, Jacqueline Connolly[1], Daniel Shelton[1], Reagin Hoover[1], Na Jin Seo[1], Ryan Downey[2], Patty Coker-Bolt[1]; [1]Occupational Therapy, MUSC, [2]Health Sciences and Research, MUSC.

024 Piece It Together: Exercise and Wellness Program for Young Adults with Autism Spectrum Disorders and Mild Developmental Disorders, Katherine E Harris[1], Carrie Papa[2], Janis M Newton[3], Keely Flynn[3], Kathleen Blaylock[3], Tyler Hunter[4], Becca Cook[3], Eve Spratt[2]; [1]College of Medicine, MUSC, [2]Developmental Pediatrics, MUSC, [3]Wellness Center, MUSC, [4]MUSC.

025 A Characterization of Perinatal Cigarette Smokers Delivering At MUSC Through Inpatient Cessation Counseling and Interactive Voice Response Follow-Up, Cameron Wheeler[1], Georges El Nahas[2], Michael Cummings[3], Erin McClure[3], Constance Guille[3]; [1]College of Medicine, MUSC, [2]Tobacco Policy and Control Program, MUSC, [3]Psychiatry and Behavioral Sciences, MUSC.

026 Alcohol Approach-Avoidance Training: A Computerized Task to Reduce Adolescent Binge Drinking, Avery E Acuff[1], Patrick K Randall[2], Jack R McKee[2], Lindsay M Squeglia[2]; [1]College of Medicine, MUSC, [2]Psychiatry and Behavioral Sciences, MUSC.

027 Blood Pressure Monitoring in Peri- and Post-Menopausal African American Women, Margaret K Ball-Dayson, Daniel Lackland; Neurology, MUSC.

028 Kidney Transplant Recipients Attitudes Toward Using Mobile Health Technology for Managing and Monitoring Medication Therapy, Robert B Browning[1], Prabhakar Baliga[2], Kenneth Chavin[3], David Taber[3]; [1]College of Medicine, MUSC, [2]Surgery, MUSC, [3]Transplant Surgery, MUSC.

029 Does Postpartum Depression Affect Infant Development? Julie C Brown[1], Patty Coker-Bolt[2], Jennifer K Poon[3], Andrew Barbour[3], Dorothea D Jenkins[3]; [1]College of Medicine, MUSC, [2]Occupational Therapy, MUSC, [3]Pediatrics, MUSC.

030 A Comprehensive View of Frequent Emergency Department Users Based on Data From a Regional HIE, Adam B Sendor[1], Jihad Obeid[2], Jingwen Zhang[2], Christopher Arnaud[2], Justin Marsden[2], Cathy L Melvin[2], Steven Saef[2], Christine Carr[2]; [1]Medicine, MUSC, [2]Emergency, MUSC.

031 The Impact of Sociodemographic Factors on Perceived Stress During Pregnancy, Makiera L Simmons[1], Reona Broadwater[1], Wei Wei[2], Judith Shary[2], Carol Wagner[2]; [1]Medicine, MUSC, [2]Neonatology, MUSC.

032 Capturing Patient Upper Limb Gross Motor Categories Using Kinect, Sara J Atkinson, Elizabeth M Humanitzki, Na Jin Seo; Occupational Therapy, MUSC.

Session 3: Clinical-Professional-Masters II — Basic/Clinical Sciences

033 Hop, a Linker Between Heat Shock Proteins and the Piwi-piRNA Pathway, Joseph A Karam, Dhanjaya Nayak, Rasesh Parikh, Vamsi K Gangaraju; Biochemistry, MUSC.

034 AFP and TTR Expressed Cells in Visceral Endoderm (VE) Development, Jia Jia[1], Dai Yunkai[2], Ann C Foley[1]; [1]Bioengineering, Clemson University, [2]Regenerative Medicine and Cell Biology, MUSC.

035 Does µCT Diagnosis Accurately Reflect Suture Fusion Status in Craniosynostosis? Stefan J Wilkes[1], Trish Parsons[2], R Nicole Howie[1], Emily Durham[1], Laurel Black[1], Mohammed Elsalanty[3], Seth Weinberg[2], Jame Cray[4]; [1]Dental Medicine, MUSC, [2]Oral Biology, University of Pittsburgh, [3]Oral Biology, Georgia Regents University, [4]Oral Health Sciences, MUSC.

036 SPARC Regulates Collagen I Composition and Cellularity in the Extracellular Matrix of Murine PDL, Christina L Covar, Emilie M Rosset, Amy D Bradshaw; Cardiology, MUSC.

037 Is the C2 Spinous Process Efficacious As an Intraoperative Indicator for Avoidance of the Vertebral Arteries During Posterior Cervical Arthrodesis? Emily M Green[1], Andrew Pham[2], William Barfield[2], Eric J Belin[2]; [1]College of Medicine, MUSC, [2]Orthopaedics, MUSC.

038 PET-CT Findings of Perineural Tumor Spread in Head and Neck Cancer, Lee Hewett, Marques Bradshaw, Maria G Matheus; Radiology, MUSC.

039 Monte Carlo Analysis of Dalbavancin and Oritavancin: Impact of Serum Protein Binding and Dosage Regimens on Target Attainment Against Common Clinical Pathogens, Jordan M Chiasson, Roger L White; Pharmacy, MUSC.

040 Monte Carlo Analysis of Ceftolozane-Tazobactam and Ceftazidime-Avibactam Against Common Gram-negative Pathogens, Katelin H McGory, Roger L White; Drug Discovery and Biomedical Sciences, MUSC.

041 Immunosuppressive Targeted Nano-therapy Down-regulates EC Release of Pleiotrophin, Sulaiman S Alhudaithi[1], Satish N Nadig[2], Omar M Moussa[3], Carl Atkinson[1], Ann-Marie Broome[4], Suraj Dixit[4]; [1]Microbiology & Immunology, MUSC, [2]Surgery, MUSC, [3]Pathology & Laboratory Medicine, MUSC, [4]Radiology & Radiological Sciences, MUSC.

042 Targeted Ex-vivo Nanotherapy is Protective Against Alloimmune Destruction in Solid Organ Transplantation, Grace L Bazzle[1], Spencer Staub[1], Ann-Marie Broome[2], Suraj Dixit[2], Satish N Nadig[3], Carl Atkinson[1]; [1]Microbiology and Immunology, MUSC, [2]Center for Biomedical Imaging, MUSC, [3]Surgery, MUSC.

043 Gap and Tight Junction Stabilization in Cardiac Transplantation, Ryan M Finnegan[1], Peng Zhu[1], Satish Nadig[2], Carl Atkinson[1]; [1]Microbiology and Immunology, MUSC, [2]Surgery, MUSC.

044 Complement Peptide C3a Induces Non-lytic Release of ATP From Candida Glabrata Leading to Cell Death, Jessica Dinh[1], Silvia Vaena de Avalos[2], Caroline Westwater[2]; [1]Microbiology and Immunology, MUSC, [2]Oral Health Sciences, MUSC.

045 The AlphaCT-1 Peptide Promotes Retinal Pigment Epithelium Cell Integrity in Models of Age Related Macular Degeneration, Elisabeth Obert[1], Christina Grek[2], Gautam Ghatnekar[2], Baerbel Rohrer[1]; [1]Neurosciences, MUSC, [2]FirstString Therapeutics.

046 Localization of Scleraxis in Keloid Disease, La'Toya I James, Andrea Nillas, Titus Reaves; Regenerative Medicine and Cell Biology, MUSC.

047 Comparison of Bleeding and Continuation of the Contraceptive Implant in Obese Versus Normal Weight Women, Andrea M Peterson, Amy Brown, Ashlyn H Savage, Angela R Dempsey; Obstetrics and Gynecology, MUSC.

048 Role of Programmed Cell Death in Complement Peptide Mediated Killing of Candida Species, Katelyn Schneider[1], Silvia Vaena de Avalos[2], Caroline Westwater[2]; [1]Dental Medicine, MUSC, [2]Oral Health Sciences, MUSC.

049 Molecular Diffusion of Glucose and Lactate in Porcine Temporomandibular Joint Disc, Michael Brown[1], Hai Yao[2], Yongren Wu[3], Nicholas Wegner[1]; [1]Dental Medicine, MUSC, [2]Bioengineering, Clemson-MUSC, [3]Orthopaedics, MUSC.

050 Bioprinted Matrices in an Effort to Augment Bone Healing Defects, Adam C Jenkins[1], Samuel Herberg[2], R Nicole Howie[3], Emily Durham[3], Laurel Black[3], Mohammed Elsalanty[4], William D Hill[5], James J Cray[3]; [1]Dental Medicine, MUSC, [2]Bioengineering, Case Western Reserve University, [3]MUSC, [4]Oral Biology, Georgia Regents University, [5]Cellular Biology and Anatomy.

051 Peptide-mediated Delivery of SiRNAs to Oral Cancer Cells In Vivo and Generation of GPMVs for Translocation Studies, Laurence P Eggart[1], Angela Alexander-Bryant[2], Andrew Jakymiw[1]; [1]Oral Health Sciences, MUSC, [2]Bioengineering, Clemson-MUSC.

052 Effect of a Home-based Intervention By Trained Community Health Nurses on Immunization Rates, Exclusive Breastfeeding, Growth Parameters, and Hospitalizations for Respiratory and Diarrheal Illness, Vasanthan Kuppuswamy[1], Sarah Logan[2], Janani Sridhar[2], Elizabeth O'Brien[3], Deepa Ranganathan[4], Kalpana Manthiram[5], Andrea Summer[3]; [1]College of Medicine, MUSC, [2]MUSC, [3]Pediatrics, MUSC, [4]Pediatrician, [5]National Institute of Health.

053 Development of an Elastic Force-field to Influence Mediolateral Foot Placement During Walking, Elizabeth Nyberg, Jordan Broadway, Jesse Dean; Physical Therapy, MUSC.

054 Investigation of Inflammatory Infiltrates By Histologic Type in MSI and MSS Colorectal Cancers, Melissa A Batson[1], Shaoli Sun[2], David N Lewin[2], Elizabeth G Hill[1], Allan DeToma[1], Kristin Wallace[1]; [1]Public Health Sciences, MUSC, [2]Surgical Pathology, MUSC.

055 Brain CT in Acute Traumatic Brain Injury: Are We Missing Subdural Hematomas with Axial Images Alone? William C Mostertz[1], Genevieve Maass-Bolles[2], Komal Sharma[3], Heather R Collins[2], Timothy J Amhrein[4], Maria G Matheus[2]; [1]Medicine, MUSC, [2]Radiology, MUSC, [3]Radiology, St. Vincent's, [4]Radiology, Duke.

056 Determining the Binding Constants of the OAR Domain of PRRX1a with Cofactors Using the Biacore System, James B Tankersley, Richard Thompkins, Michael J Kern; Regenerative Medicine and Cell Biology, MUSC.

Session 4: Clinical-Professional-Masters III — Basic/Clinical Sciences

057 Association Between Routine Triple-Rule-Out Computed Tomography and Reduced Hospital Admissions, Length of Stay, Recidivism Rates, and Cost in the Emergency Department Triage of Chest Pain, Tindal W McLaurin[1], Taylor Khulman[1], Andrew Stubenrauch[1], Ashley Parinella[1], Maxwell Stroebel[1], Julian Wichmann[2], Joesph U Schoepf[2]; [1]College of Medicine, MUSC, [2]Cardiovascular Imaging, MUSC.

058 Does Upper Extremity Movement Efficiency Relate to Participation Post-Stroke? Martha Bliven, Kristine O'Connor, Jordan Perry, Michelle Woodbury, Emily Grattan; Health Science and Research, MUSC.

059 Feasibility of a Scapular Tracking Device to Assess Post Stroke Shoulder Impairment, Catie F Lang[1], Hunter D Faulk[1], Michelle L Woodbury[2], Christian Finetto[2]; [1]Occupational Therapy, MUSC, [2]Health Science and Research, MUSC.

060 What is the Relationship Between Repeated Practice and Arm Motor Ability for Stroke Survivors? Haley D Swanson[1], Heather K Michalak[1], Sally E Gooch[1], Michelle L Woodbury[2]; [1]Occupational Therapy, MUSC, [2]Health Science and Research, MUSC.

061 Effect of Saturated Fatty Acid Heptadecanoic Acid (C17:0) Rich Diet on the FGF21/Adiponectin/Ceramide Axis in Bottlenose Dolphins (Tursiops Truncatus), Tyler S Harrell[1], Phillip Sobolesky[2], Stephanie Venn-Watson[3], Michael Janech[2]; [1]Marine Biology, CofC, [2]Nephrology, MUSC, [3]NMMF.

062 Co-targeting EGFR/ROS RTK and HDAC By a Novel Agent in Glioblastoma, Megan LT Hilbert[1], Scott M Lindhorst[2], David Cachia[3], William A Vandergrift III[3], Abhay K Varma[3], Naren L Banik[3], Sunil J Patel[3], Arabinda Das[3]; [1]College of Medicine, MUSC, [2]Medicine, MUSC, [3]Neurosurgery, MUSC.

063 The Impact of HIV-Centered Obstetric Care on Perinatal Transmission and Maternal Linkage to Care in HIV-Infected Women, Julia M DeVita, Andrea Peterson, Amartha Ogburu-Ogbonnaya, Anna M Powell, Lazenby B Gweneth; Obstetrics and Gynecology, MUSC.

064 Engaging Dental Students in Ergonomics, Claire E Murphy[1], Marie J Schaner[1], Peter J Bowman[1], Joe Vuthiganon[2]; [1]Occupational Therapy, MUSC, [2]Dental Medicine, MUSC.

065 Ocular Light Scatter, Ray-tracing Aberrometry, and Scheimpflug Densitometry As an Objective Measure of Dysfunctional Lens Syndrome, Evan R Zeldin[1], George O Waring IV[2], Karolinne M Rocha[2]; [1]College of Medicine, MUSC, [2]Cornea and Refractive Surgery, Storm Eye Institute.

066 Prescription Reporting with Immediate Medication Utilization Mapping (PRIMUM) in the Pediatric Orthopaedic Population, Robert T Simril[1], Joseph R Hsu[2], Brian P Scannell[2], Primum Group[3], Rachel Seymour[2]; [1]MUSC, [2]Orthopaedic Surgery, Carolinas Medical Center, [3]Carolinas HealthCare System.

067 Secondary Intraocular Lens Implantation Following Infantile Cataract Surgery: Indications, Lens Placement, and Long-term Postoperative Outcomes, Katherine S Wood[1], Dina Tadros[2], Rupal H Trivedi[1], M Wilson[1]; [1]Pediatric Ophthalmology, MUSC, [2]Ophthalmology, Tanta University, Egypt.

068 The Effect of Incline Versus Decline Walking in Chronic Stroke, Jessica E Huschart[1], Elizabeth C Wonsetler[2], Aaron E Embry[2], Steven A Kautz[2], Mark G Bowden[3]; [1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC, [3]Ralph H. Johnson VA Medical Center.

069 The Effect of Altering Hip Extension on Kinetic Gait Variables, Ellie L Miller[1], Elizabeth C Wonsetler[2], Mark G Bowden[2]; [1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC.

070 The Variability of Kinetic Parameters with Altered Walking Speed, Sarah E Atwater[1], Elizabeth C Wonsetler[2], Mark G Bowden[2]; [1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC.

071 The Effect of Changing Speed on Kinetic Gait Variables, Katherine L Huey[1], Elizabeth C Wonsetler[2], Mark G Bowden[2]; [1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC.

072 Effects of White Noise Achilles Tendon Vibration on Standing Posture, Erin M Gaffney[1], Carly C Sacco[2], Jesse Dean[2]; [1]Physical Therapy, MUSC, [2]Ralph H. Johnson VAMC.

073 Higher Step Counts Are Correlated with Better Functioning and Quality of Life in Advanced-Stage Lung Cancer, Mary C Brooks[1], Brett Bade[2], David Thomas[2], JoAnn Scott[2], Sloan Nietert[2], Ansley Ulmer[2], Paul Nietert[3], Gerard Silvestri[2]; [1]College of Medicine, MUSC, [2]Pulmonary and Critical Care, MUSC, [3]Public Health Sciences, MUSC.

074 Mobile Vs. Stationary Mammography: Examining Patient Characteristics and Behaviors, Elizabeth G Stanley, Madelene C Lewis; Radiology, MUSC.

075 Quantitative Evaluation of Left Ventricular Myocardial Contractility Using a Prototype Software Application, Megha Penmetsa[1], Pal Suranyi[2], Sheldon Litwin[3], Akos Varga-Szemes[2], U Joseph Schoepf[2]; [1]College of Medicine, MUSC, [2]Radiology, MUSC, [3]Cardiology, MUSC.

076 Use of Cardiac CT to Preoperatively Plan Mitral Valve Leipzig Loop Repair for Mitral Valve Repair, Maxwell H Stroebel[1], Joseph U Schoepf[2], Damiano Caruso[2], Carlo de Cecco[2]; [1]College of Medicine, MUSC, [2]Cardiovascular Imaging, MUSC.

077 Dual-source Dual-energy CT: Optimizing Performance of Routine Contrast Enhanced Chest CT for Detection of Pulmonary Embolus, Scott P Landreth, Damiano Caruso, Carlo DeCecco, James Ravenel; MUSC.

078 Examination of a Mouse Model with Bicuspid Aortic Valves for Ascending Aortic Wall Anomalies, Brittany L Cureton[1], Loren E Dupuis[2], Christine B Kern[2]; [1]Medicine, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC.

079 Bring Home Baby: Parents' Perceptions of NCU Discharge and Infant Readiness in Transitional Care, Bethany L Carlos[1], Sarah Taylor[2]; [1]COM, MUSC, [2]Neonatology, MUSC.

Session 5: Clinical-Professional-Masters IV — Basic/Clinical Sciences

080 Categorizing Medical Comorbidities in Autism Spectrum Disorders and Intellectual Disability, Dana Coccola[1], Laura Carpenter[2], Andrea Boan[3], Jane Charles[2], Catherine Bradley[2]; [1]College of Medicine, MUSC, [2]Developmental and Behavioral Pediatrics, MUSC, [3]Pediatrics, MUSC.

081 Providing Free Primary Care to the Chronically Ill: Impact on Emergency Department Utilization, James J Steen[1], Lisa D Mims[2]; [1]College of Medicine, MUSC, [2]Family Medicine, MUSC.

082 Improving Geriatric and End of Life Care in a Family Medicine Residency Program, Victoria A Way, Russell Blackwelder, Danielle Metzler, Jennifer Gavin, James Steen, Vanessa Diaz; Family Medicine, MUSC.

083 The Impact of Targeted Rapamycin Nanotherapy on Epithelial Cell Injury In Lung Transplantation, Spenser Staub[1], Grace Bazzle[1], Surij Dixit[2], Ann-Marie Broome[2], Satish Nadig[1], Carl Atkinson[1]; [1]Microbiology and Immunology, MUSC, [2]Center for Biomedical Imaging, MUSC.

084 Association of Observed Community Environment and Body Mass Index Among Baltimore Public Housing Residents, Trinh Chu[1], Meena Chatrathi[2], Jennifer Peyton[2], Kimber Gudzune[2]; [1]MUSC, [2]Johns Hopkins University.

085 Macrophage Apoptosis Induced By Malondialdehyde-modified LDL, Johnathon W Elkes[1], Maria F Lopes Virella[2], Gabriel Virella[3]; [1]College of Medicine, MUSC, [2]Charleston Research Institure, [3]Ralph H Johnson VAMC.

086 Localization of Scleraxis in the Large Intestine, Alyssa M Huggins[1], Andrea Nillas[2], Titus A Reaves[2]; [1]Medicine, MUSC, [2]Regenerative Medicine, MUSC.

087 Assessment of Blood Pressure Awareness in Young African-American Women, Amy K Moon[1], Daniel T Lackland[2]; [1]College of Medicine, MUSC, [2]Neurosciences, MUSC.

088 The Fli-1 Transcription Factor Regulates the Expression of IFN-gamma Inducible Protein 10 (IP10), Tomika S Caldwell[1], Danielle Brandon[1], Mara Lennard-Richards[1], Ning Lou[1], John Zhang[2]; [1]Rheumatology and Immunology, MUSC, [2]Rheumatology and Immunology; VA Medical Center.

089 Hypertension and Type 2 Diabetes Mellitus As Co-factors for Microbleed Presence in Stroke Patients, Maham Awan, Daniel Lackland; Neurology, MUSC.

090 Internet-Based Health Tracking Software As an Intervention to Improve Blood Pressure Awareness Among Young African American Men, Jamel LF Brown, Daniel Lackland; Neuroscience, MUSC.

091 Prognostic Significance of Extracapsular Spread, Perineural and Lymphovascular Invasion in Patients with HPV and Non-HPV Related Oropharyngeal Squamous Cell Carcinoma, Robert B Borucki[1], Shaun A Nguyen[2], Elizabeth Nicolli[2], Shaum Sridharan[2], Terry A Day[2], David M Neskey[2]; [1]COM, MUSC, [2]Otolaryngology, MUSC.

092 Trends in Psychotropic Medication Use and Caregiver Education: Identifying Mental Health Concerns of Children in Foster Care in South Carolina, Morgan S Goodyear, Elizabeth M Wallis; Pediatrics, MUSC.

093 Diabetes Clinical Interventions Improve Patient Outcomes, Kendall W Headden[1], Deborah Bowlby[2], Katherine Lewis[2], Remberto Paulo[2]; [1]College of Medicine, MUSC, [2]Pediatric Endocrinology and Diabetes, MUSC.

094 Transcranial Direct Current Stimulation (tDCS) Enhances Mindfulness Meditation in Meditation-NaÏve Individuals, Christopher W Austelle[1], Bashar W Badran[1], Nicole Smith[1], Chloe E Glusman[1], Brett Froeliger[2], Eric Garland[3], Mark S George[1], Baron Short[1]; [1]Brain Stimulation Laboratory, MUSC, [2]Neuroscience, MUSC, [3]University of Utah.

095 Parental Stress Levels in Kinship Care Guardians, Leslie K Ruffing[1], Maggie J Wilkes[2], Madison Hyer[3], Carrie Papa[4], Sudie Back[5], Ellen Maher[1], Eve Spratt[4]; [1]College of Medicine, MUSC, [2]Child Psychiatry, MUSC, [3]Public Health Science, MUSC, [4]Developmental Pediatrics, MUSC, [5]Psychiatry and Behavioral Science, MUSC.

096 A Bilateral Anomaly: Vertebral Arteries Originating From Aortic Arch, Christen E Chaconas, Michael Antonucci; MUSC.

097 Methotrexate-induced Myelopathy of the Dorsal Column Following Intrathecal Therapy of a Patient with Spinal Involvement of Burkitt Lymphoma, Ross M Hansen[1], Mike Antonucci[1], Amy-Lee Bredlau[2], Michelle Hudspeth[2]; [1]Radiology, MUSC, [2]Pediatrics, MUSC.

098 Multireader Evaluation of Advanced Image-Based Virtual Monoenergetic Reconstruction of Dual-Energy CT Data At Low KeV Improves Image Quality of Liver Imaging, Parker W Leland, Andrew Hardie, Carlo De Cocco, Damaino Caruso; Radiology, MUSC.

099 A Noise-Optimized Virtual Monochromatic Reconstruction Algorithm Improves Stent Visualization and Diagnostic Accuracy for Detection of In-Stent Stenosis in Lower Extremity Run-Off CT Angiography, Andrew C Stubenrauch, U Joseph Schoepf, Stefanie Mangold, Carlo De Cocco, Ricardo Yamada, Akos Varga-Szemes, Damiano Caruso, Julian Wichmann; Radiology, MUSC.

100 Bilateral Transradial Approach to Alcohol Septal Ablation for Symptomatic Hypertrophic Obstructive Cardiomyopathy, Shawn Shaji[1], Barbara E Griffin[1], Alexandria Panuccio[1], John M Neathawk[2], Stewart M Benton[3], Jeremy D Rier[3], Valerian L Fernandes[3], Christopher D Nielsen[3]; [1]College of Medicine, MUSC, [2]Internal Medicine, MUSC, [3]Heart and Vascular Center, MUSC.

101 The Incidence and Risk Factors of Hepatocellular Cancer Recurrence Following Liver Transplantation, Edward D Colhoun[1], Carl G Forsberg[1], David Taber[2], Kenneth D Chavin[2], Prabhakar Baliga[2]; [1]COM, MUSC, [2]Transplantation, MUSC.

102 An Analysis of Orthotopic Liver Transplant Data Seeking to Improve 30-day and 1-year Overall Survival, Adam F Hernandez[1], Richard Slay[2], Ken Chavin[1]; [1]Transplant Surgery, MUSC, [2]Science, Clemson.

103 The Mechanism of Action of the Anti-fibrotic Drug MMS-350 Includes Activation of the Transcription Factor C-Ets-1, Catherine M Svetcharnik[1], Logan Mlakar[1], Peter Wipf[2], Carol Feghali-Bostwick[1]; [1]Medicine, MUSC, [2]Chemistry, University of Pittsburgh.

Session 6: PhD I: Years 1-2

104 The Role of P97 in DNA Crosslink Repair, Halley B Rycenga, David T Long; Biochemistry, MUSC.

105 Development of Novel Penicillin Binding Protein 2 (PBP2) Inhibitors As Drug Candidates for Penicillin- and Cephalosporin-resistant Neisseria Gonorrhoeae, Jonathan M Turner[1], Patrick M Woster[2], Christopher Davies[1]; [1]Biochemistry and Molecular Biology, MUSC, [2]Drug Discovery and Biomedical Sciences, MUSC.

106 Translational Regulation of ILEI Contributes to Vemurafenib Resistance in BRAF V600E/PTEN-null Melanoma Cells, Ken Noguchi, Buckley J McCall, Alec N Woosley, Bidyut Mohanty, Laura A Link, Philip H Howe; Biochemistry and Molecular Biology, MUSC.

107 Targeting the Protein Kinase HUNK in Triple-Negative Breast Cancer, Carly Bess Williams[1], Melissa Abt[1], Lewis Chodosh[2], Elizabeth Yeh[1]; [1]Cell and Molecular Pharmacology & Experimental Therapeutics, MUSC, [2]Cancer Biology, University of Pennsylvania.

108 The Role of TAK1 in Sinoatrial Node Differentiation, Yunkai Dai[1], Ann Foley[2]; [1]Bioengineering, Clemson University, [2]Regenerative Medicine and Cell Biology, MUSC.

109 Access to Quality Care for People Living with Systemic Lupus Erythematosus: Use of Ambulatory Care Sensitive Conditions As a Predictor of Access, Elizabeth A Brown[1], Kit Simpson[2]; [1]Health Professions, MUSC, [2]Healthcare Leadership and Management, MUSC.

110 Evaluation of 3,5-diamino-1,2,4-triazoles As Epigenetic Modulators for the Treatment of Periodontal Disease (PD), Joy E Kirkpatrick, Mark A Johnson, Patrick M Woster; Drug Discovery and Biomedical Sciences, MUSC.

111 Validation of Theoretical Pathway Between Discrimination, Diabetes Self-Care and Glycemic Control, Aprill Z Dawson[1], Rebekah J Walker[2], Jennifer A Campbell[1], Leonard E Egede[1]; [1]Center for Health Disparities Research, MUSC, [2]Health Equity and Rural Outreach Innovation Center, Charleston VA.

112 Mechanistic Implications of Advanced Glycation End-products to Prostate Cancer and Racial Disparity, Danzell Smith[1], Dion Foster[1], Van Phan[1], Victoria J Findlay[1], Lourdes M Nogueira[1], Judith D Salley[2], Marvella E Ford[3], David P Turner[1]; [1]Pathology, MUSC, [2]Bio. and Phys. Sci., SCSU, [3]Public Health Science, MUSC.

113 Genome-scale Genetic Knockout Screen Identifies Modifiers of EGFR Dependence in Non-small Cell Lung Cancer, Jon DiMaina[1], Chris Duckworth[1], Starr E Hazard[2], Gerard Hardiman[3], Hiu Wing Cheung[1]; [1]Pathology and Laboratory Medicine, MUSC, [2]Computational Biology Resource Center, MUSC, [3]Medicine, MUSC.

114 Interruption of GAB2-CRKL Interaction in Ovarian Cancer, Nathaniel R Jensen, Christopher Duckworth, Hiu Wing Cheung; Pathology, MUSC.

115 Comparison of Multiple Sites Monitoring Ambient Air Quality in Charleston, South Carolina, Raymond M Boaz[1], John Pearce[2]; [1]Biostatistics, MUSC, [2]Epidemiology, MUSC.

116 The Current State of HIV Self-Testing Globally: A Literature Review, Caroline J Vrana[1], Danielle R Stevens[1], Raviv Dlin[2], Jeffrey Korte[1]; [1]Public Health Sciences, MUSC, [2]Public and Community Health, Ithaca College.

117 Role of Folate in Endometriosis Associated Ovarian Cancer (EAOC): a Case-Control Study From the Ovarian Cancer Association Consortium, Lin Yin[1], Terry Kathryn[2], Bandera Elisa[3], Rossing Mary[4], Goodman Marc[5], Webb Penelope[6], Kelemen Linda[7]; [1]Public Health Science, MUSC, [2]Epidemiology, Harvard School of Public Health, [3]Cancer Prevention and Control Program, Rutgers Cancer Institute of New Jersey, [4]Fred Hutchinson Cancer Research Center, [5]Samuel Oschin Comprehensive Cancer Institute, Cedars-Sinai Medical Center, [6]Gynaecological Cancers Group, QIMR Medical Research Institute, [7]Public Health Sciences, MUSC.

118 The Role of ADAMTS5 in Dynamic Proteoglycan Turnover During Temporomandibular Joint Development and Maintenance, Alexandra W Rogers, Christine B Kern; Regenerative Medicine and Cell Biology, MUSC.

Session 7: PhD II: Years 1-2

119 The Effect of Asthma and Bullying on Suicidal Behaviors in Adolescents, Lutfiyya N Muhammad[1], Jeffrey E Korte[1], Charles M Bowman[2], Mark L De Santis[3], Paul J Nietert[1]; [1]Public Health Sciences, MUSC, [2]Pediatrics, MUSC, [3]Psychiatry and Behavioral Sciences, MUSC.

120 Rapid Anastomosis of Scaffold Free Endothelial-Fibroblast Constructs, Sanket Pattanaik, Heather Bainbridge, Stephen A Fann, Sarah Grace Dennis, Michael J Yost; General Surgery Research, MUSC.

121 Comparing Grip Strength of the Strong and Weak Hands on the Age Continuum: A Population-based, Cross-Sectional Study of Adults with and Without Stroke in the United States, Jennifer L Hunnicutt[1], Annie N Simpson[2], Chris M Gregory[3]; [1]Health and Rehabilitation Sciences, MUSC, [2]Healthcare Leadership and Management, MUSC, [3]Health Sciences and Research, MUSC.

122 Anticipating Upper Extremity Motor Recovery Based on Response Patterns Produced During a Virtual Reality Game Intervention, Scott D Hutchison, Michelle L Woodbury; Health Science & Research, MUSC.

123 Association Between Self-Reported Exercise and Major Depressive Disorder in Chronic Spinal Cord Injury, Catherine J VanDerwerker, Yue Cao, Chris M Gregory, James S Krause; Health Sciences and Research, MUSC.

124 Disruption of MGluR/SK Inhibition in VTA Dopamine Neurons By Exposure to Stress Potentiates the Responsiveness to Cocaine, Jeffrey Parrilla, Bethany Pavlinck, Carries Bayle, Art Riegel; Neuroscience, MUSC.

125 The Effects of a TrkB Agonist on the Rodent Stress Response, Jonathon A Koerber, Chantelle Ferland, Torry S Dennis, Erica Herzig, Jacqueline F McGinty; Neuroscience, MUSC.

126 The Representation of Semantic Content and Attentional State in Temporal Lobe During Visual Processing of Natural Scenes: an ECoG Study, Zahraa N Sabra, Jessica Breedlove, Leonardo Bonilha, Thomas Naselaris; Neurosciences, MUSC.

127 Are Pericytes Liaisons Between Neurons and Vascular Smooth Muscle Cells? David A Hartmann, Andy Y Shih; Neuroscience, MUSC.

128 Right Inferior Frontal Gyrus Inhibitory-Control-Associated BOLD Activation and Grey Matter Volume Independently Predict Smoking Cessation Outcomes, Patrick A McConnell[1], Amanda Mathew[1], Maggie Sweitzer[2], Joseph F McClernon[2], Brett Froeliger[1]; [1]Neurosciences, MUSC, [2]Psychiatry & Behavioral Sciences, DUKE.

129 Predictive Coding Model of Mental Imagery, Jesse L Breedlove[1], Nicholas DeSisto[2], Thomas Naselaris[1]; [1]Neurosciences, MUSC, [2]Computer Science, CofC.

130 More Than Meets the Eye: What Visual Cortex Reactivity to Cues May Tell Us About Neural Processing in Addiction, Logan T Dowdle[1], Thomas Naselaris[2], Brett Froeliger[2], Colleen A Hanlon[1]; [1]Psychiatry, MUSC, [2]Neurosciences, MUSC.

131 Alterations in Cortical Laterality Among Individuals At Risk for Stroke: A Functional MRI Study in Controls and Patients, Daniel H Lench, Christopher Austelle, Colleen Hanlon; Neuroscience, MUSC.

Session 8: PhD I: Years 3+

132 In Vivo Exposure Phenotype and Stem Cell Transcriptomics to Determine If Dioctyl Sodium Sulfosuccinate (DOSS) is a Bona Fide Obesogen, Alexis M Temkin[1], Robert R Bowers[2], Demetri D Spyropoulos[2]; [1]MBES, MUSC, [2]Pathology, MUSC.

133 Role of the N-terminal Domain of Major Ampullate Spidroin 1 of Nephila Clavipes in Spider Silk Formation, James H Atkison, Mirko Hennig, Shaun K Olsen; Biochemistry and Molecular Biology, MUSC.

134 Biomechanics of Temporomandibular Joint on Body Level, Feng Wei[1], Mark H Van Horn[2], Jeffrey C Nickel[3], Hai Yao[1]; [1]Bioengineering, Clemson University, [2]Radiology and Radiological Sciences, MUSC, [3]Orthodontics and Dentofacial Orthopedics, UMKC.

135 The Effect of Education on Wealth: Trends and Predictors of Wealth in Kenya Between 1993 and 2008-09, Delia C Voronca[1], Rebekah Walker[2], Leonard E Egede[3]; [1]Biostatistics, MUSC, [2]COIN, VAMC, [3]Center for Health Disparities Research, MUSC.

136 Mechanism of 5-Hydroxytryptamine 1F Receptor Stimulation of Mitochondrial Biogenesis in the Kidney, Whitey S Gibbs, Craig C Beeson, Rick G Schnellmann; Drug Discovery and Biomedical Sciences, MUSC.

137 Susceptibility of Mitochondrial Mutant Zebrafish to Sublethal Levels of Common Toxicants, Tucker J Williamson, Jennifer J Rahn, Sherine SL Chan; Drug Discovery and Biomedical Science, MUSC.

138 Self-Efficacy and Its Impact On Post-Stroke Rehabilitation, Kelly R Anderson, Scott Hutchison, Michelle Woodbury; Health and Rehabilitation Science, MUSC.

139 Use of the Rasch Measurement Model to Investigate Measurement Properties for the Dynamic Gait Index in Stroke, Stacey E Aaron[1], Ickpyo Hong[1], Mark G Bowden[1], Chris M Gregory[1], Aaron E Embry[1], Craig A Velozo[2]; [1]Health Sciences and Research, MUSC, [2]Occupational Therapy, MUSC.

140 Characterizing Patterns of Thyroid Function and Regulation in the Late-Stage Embryonic American Alligator, Thomas M Galligan[1], Ashley SP Boggs[2], Benjamin B Parrott[1], Louis J Guillette[1]; [1]Obstetrics and Gynecology, MUSC, [2]National Institute of Standards and Technology.

141 Mercury Found in MC252 & CWAF Depleted MC252 Can Be Transmitted Through the American Alligator Eggshell to the Embryo, Frances M Nilsen[1], Stephen E Long[2], Louis J Guillette[3], Demetri D Spyropoulos[4]; [1]Environmental Chemical Sciences, NIST, [2]Chemical Sciences, NIST, [3]Obgyn, MUSC, [4]Pathology, MUSC.

142 SPARC Influences Collagen Fiber Morphology and Monocyte Activity in a Murine Model of Periodontal Disease, Emilie Rosset[1], Jessica Trombetta-eSilva[1], Amy D Bradshaw[2]; [1]Dental Medicine, MUSC, [2]Medicine, MUSC.

143 Inhibition of Class I Histone Deacetylases At Reperfusion Attenuates Ischemia-Reperfusion Injury and Modifies Mitochondrial Acetylation, Daniel J Herr[1], Sverre E Aune[1], Donald R Menick[2]; [1]Medicine, MUSC, [2]Ralph H. Johnson VA Medical Center.

144 Neural and Behavioral Correlates of Inhibitory Control and Cigarette Smoking, Spencer Bell[1], Christie Eichberg[1], Patrick McConnell[1], F J McClernon[2], Brett Froeliger[1]; [1]Neurosciences, MUSC, [2]Psychiatry and Behavioral Sciences, Duke University.

145 Cocaine Self-administration and Cue-reinstatement Disrupt Kv7 (KCNQ) Channel Inhibition in the Prefrontal Cortex, William Buchta, Arthur Riegel; Neurobiology of Addiction Research Center, MUSC.

146 Withdrawn

147 Eicosanomics: Novel Approaches to Investigate the Effect of Oil/dispersant Exposure on Eicosanoid Synthesis in the Chorioallantoic Membrane of Sentinel Species, Theresa M Cantu[1], Alexis Temkin[2], John Bowden[1], Demetri Spyropoulos[2]; [1]Obstetrics and Gynecology, MUSC, [2]Pathology, MUSC.

148 MK2 Signaling Regulates Monocyte Plasticity During Aggregatibacter Actinomycetemcomitans-induced Inflammatory Bone Loss, Bethany A Herbert, Heidi Steinkamp, Keith L Kirkwood; Oral Health Sciences and the Center for Oral Health Research, MUSC.

149 Elucidating Oncogene Targets in the 8p11-p12 Amplicon to Treat Breast Cancer, Alexandria C Rutkovsky, Stephen P Ethier; Pathology and Laboratory Medicine, MUSC.

150 The Role of PTEN in Basal-Like 2 Triple Negative Breast Cancer, Ericka L Smith, Christiana Kappler, Stephen P Ethier; Pathology, MUSC.

151 WHSC1L1 and Estrogen-independent Activation of Estrogen Receptor-alpha in 8p11 Amplicon-bearing Cell Lines, Jamie N Mills[1], Jon Irish[2], Brittany Turner-Ivey[1], Stephen Ethier[1]; [1]Pathology, MUSC, [2]Wayne State University.

152 Noise-induced Hearing Loss Is Mediated By the Activation of AMPK Signaling, Kayla Hill, Hu Yuan, Xianren Wang, Su-Hua Sha; Pathology, MUSC.

153 Phosphorylation Dynamics of PTH Receptor Signaling In Osteoblasts with Biased and Unbiased Agonists, Grace R Williams[1], Mary N Berkaw[1], Jennifer R Bethard[1], Louis M Luttrell[2], Lauren E Ball[1]; [1]Pharmacology, [2]Medicine.

154 Improved Disease Burden Modeling Based on Administrative Healthcare Data, Ralph C Ward[1], Mulugeta Gebregziabher[1], Leonard Egede[2]; [1]Public Health Sciences, MUSC, [2]HEROIC COIN, Ralph H. Johnson VAMC.

155 Predicting Long-term Functional Outcome After Moderate to Severe Traumatic Brain Injury with Biomarkers: A Practical Tool, Liqiong Fan[1], Bethany J Wolf[1], Michael Frankel[2], David W Wright[3], Sharon D Yeatts[1]; [1]Public Health Sciences, MUSC, [2]Neurology, Emory, [3]Emergency Medicine, Emory.

156 Engineering Alginate As Bioink for Bioprinting, Jia Jia, Dylan J Richards, Richard P Visconti, Thomas C Trusk, Michael J Yost, Hai Yao, Roger R Markwald, Ying Mei; Regenerative Medicine and Cell Biology, MUSC.

157 Silicon Nanowires Induced Maturation of Cardiomyocytes Derived From Human Induced Pluripotent Stem Cells, Yu Tan[1], Dylan Richards[1], Donald R Menick[2], Bozhi Tian[3], Ying Mei[1]; [1]Bioengineering, Clemson, [2]Cardiology, MUSC, [3]Chemistry, University of Chicago.

Session 9: Postdoc / Resident / Fellow / Staff Scientist I

158 Facilitators and Barriers to Lung Cancer Screening Among Veterans, Neeti M Kanodra, Charlene Pope, LaShanta J Rice, Chanita Hughes Halbert, Nichole T Tanner; Medicine, MUSC.

159 Ceramide is A Key Factor That Regulates The Crosstalk Between TGF-β and Sonic Hedhehog Signaling At The Basal Cilia To Control Cell Migration and Tumor Metastasis, Salih Gencer[1], Natalia Oleinik[1], Mohammed Dany[1], Can E Senkal[1], Kristi L Helke[2], Besim Ogretmen[1]; [1]Biochemistry and Molecular Biology, Hollings Cancer Center, [2]Comparative Medicine and Laboratory Animal Resources, Hollings Cancer Center.

160 Discovery of a Novel Alanine-substituted Cyclic Peptide That Acts As a Potent Inhibitor of Lysine-specific Demethylase 1 (LSD1), Isuru R Kumarasinghe, Patrick M Woster; Drug Discovery and Biomedical Sciences, MUSC.

161 Hypersensitive Esophagus: The Truth, The Myth, And The Reality, Mustafa Abdul-Hussein, Donald Castell; Gastroenterology, MUSC.

162 Examining the Feasibility of an In-Home Stroke Rehabilitation Computer Game Designed to Promote Repetitive Arm Practice for Individuals with Chronic Hemiparesis, Emily S Grattan[1], Blair S Dellenbach[1], Kelly R Anderson[2], Danielle Hutchison[1], Christian Finetto[1], Austen Hayes[3], Larry F Hodges[3], Michelle L Woodbury[1]; [1]Health Science and Research, MUSC, [2]Health and Rehabilitation Science, MUSC, [3]Recovr LLC.

163 Resilience and Psychological Distress Among Surrogate Decision Makers of Critically Ill Patients, Nadig Nandita[1], Huff Nidhi[2], Cox Christopher[2], Ford Dee[1]; [1]MUSC, [2]Duke.

164 Kallistatin Induces Breast Cancer Cell Apoptosis and Autophagy By Modulating Wnt Signaling and MicroRNA Synthesis, Pengfei Li, Youming Guo, Bledsoe Grant, Zhirong Yang, Lee Chao, Julie Chao; Biochemistry and Molecular Biology, MUSC.

165 Effect of HIV Infection on Alpha-1 Antitrypsin Function: Role in Emphysema? Sarah E Stephenson, Carole L Wilson, Kristina Crothers, Irina Petrache, Lynn M Schnapp; Medicine, MUSC.

166 FLI1 Levels Impact CXCR3 Expression and Renal Infiltration of T Cells and Renal Glycosphingolipid Metabolism in the MRL/lpr Lupus Mouse Strain, Kamala Sundararaj, Thirumagal Thiyagarajan, Ivan Molano, Fahmin Basher, Thomas Powers, Richard Drake, Tamara Nowling; MUSC.

167 The Effect of Dietary Heptadenoic Acid Enrichment on Adiponectin Multimerization and Serum Levels in Bottlenose Dolphins with Metabolic Syndrome, Philip M Sobolesky[1], Stephanie K Venn-Watson[2], John M Arthur[3], Michael G Janech[1]; [1]Medicine, MUSC, [2]Translational Medicine & Research Program, National Marine Mammal Foundation, [3]Medicine, University of Arkansas for Medical Sciences.

168 Live-Cell Imaging of the Bystander Effect in Retinal Pigment Epithelial Cell Monolayers, Masaaki Ishii, Bärbel Rohrer; Ophthalmology, MUSC.

169 Systemic Response of IL-17 Following Choroidal Neovascularization in a Mouse Model for Age-Related Macular Degeneration, Gloriane Schnabolk[1], Beth Coughlin[2], Kusumam Joseph[2], Himanshu Raikwar[2], Kannan Kunchithapautham[2], Bärbel Rohrer[2]; [1]Research Services, Ralph H. Johnson VA Medical Center, [2]Ophthalmology, MUSC.

170 Thyroid Hormone Exposure Drives SFRP4 Overexpression and WNT Antagonism in Calvarial Suture Cells, R Nicole Howie[1], Emily L Durham[1], Laurel Black[1], Ryan Kelly[2], Jeremy L Barth[3], Amanda C LaRue[2], James Cray[1]; [1]Oral Health Sciences, MUSC, [2]Pathology and Laboratory Medicine, MUSC, [3]Regenerative Medicine and Cell Biology, MUSC.

171 Tristetraprolin is Required for Alveolar Bone Homeostasis, Heidi M Steinkamp, Mary Gray, Hong Yu, Keith L Kirkwood; Oral Health Sciences, MUSC.

172 Time-Driven Activity-Based Cost Accounting for Total Hip Arthroplasty At a Large University Academic Medical Center, John Palsis[1], Jacob Drew[1], Gayle Wadford[1], Thomas Brehmer[2], Shana Dykema[3], Kathleen Plummer[1], Brian Whittsit[4], Barton Sachs[1]; [1]Orthopaedics, MUSC, [2]Health Professions, MUSC, [3]Performance Improvement, MUSC, [4]Business Management, MUSC.

173 Personal Economic Impact of Performing Elective Saturday Hand Surgery, Jonathan S Katz[1], Dil Patel[2], Ann Peterson[1], Eric Angermeier[1], Kyle Kokko[1]; [1]Orthopaedics, MUSC, [2]SOM, MUSC.

174 Effect of External Beam Irradiation on the Pathway of Bone Fracture Healing, Yongren Wu[1], Evan L Hanna[1], William R Barfield[1], Zilan Lin[1], Daniel G McDonald[2], Kenneth N Vanek[2], Hai Yao[3], Vincent D Pellegrini, Jr[1]; [1]Orthopaedics, MUSC, [2]Radiation Oncology, MUSC, [3]Clemson-MUSC Bioengineering.

175 Elucidating the Genomic Response to Cochlear Lateral Wall Injury in Adult Mice, Robert G Keller[1], Mary Bridges[2], Michael Moore[1], Yazhi Xing[2], Jeremy Barth[3], Judith Dubno[1], Hainan Lang[2]; [1]Otolaryngology, MUSC, [2]Pathology and Lab Medicine, MUSC, [3]Bioinformatics, MUSC.

176 Clinical Test Performance of Human Cochlear Reflectance Measurements, Sara E Fultz[1], Daniel M Rasetswhane[2], Judy G Kopun[2], Michael P Gorga[2], Stephen T Neely[2]; [1]Otolaryngology-Head and Neck Surgery, MUSC, [2]Center for Hearing Research, BTNRH.

177 Extracellular Matrix Versican is Critical for the Maintenance of Mouse Auditory Sensitivity After Cochlear Injury, Yazhi Xing[1], Kenyaria Noble[1], Clarisse H Panganiban[1], LaShardai N Brown[1], Edward L Krug[2], Jeremy L Barth[2], Corey H Mjaatvedt[2], Hainan Lang[1]; [1]Pathology, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC.

178 MEKK4 Signaling Regulates Sensory Cell Development and Function in the Mouse Inner Ear, Atul K Pandey, Hong-Wei Zheng, Sha Su-Hua, Puligilla Chandrakala; Pathology, MUSC.

179 An Observational Review of Pediatric Intraosseous Needle Placement in the Pediatric Emergency Department, Elysha L Pifko[1], Amanda Price[1], Carrie Busch[1], Joseph Dobson[1], Curren Smith[2], Yunyun Jiang[3], Rachel Tuuri[1]; [1]Pediatric Emergency Medicine, MUSC, [2]College of Medicine, MUSC, [3]Public Health Sciences, MUSC.

180 Microgravity Induction of TRAIL in Preosteoclast Cells Enhances Osteoclastogenesis, Yuvaraj Sambandam[1], Kelsey L Baird[1], Maxwell Stroebel[1], William L Ries[2], Sakamuri V Reddy[1]; [1]Pediatrics, MUSC, [2]Dental Medicine, MUSC.

181 Multiscale Measurement Error Models for Aggregated Small Area Health Data, Mehreteab Aregay[1], Andrew B Lawson[1], Faes Christel[2], Kirby S Russell[3], Rachel Carroll[1], Kevin Watjou[2]; [1]MUSC, [2]Hasselt University, Hasselt, Belgium, [3]University of South Florida.

182 Alpha 1-anti Trypsin Protects Islet Grafts From Death Via Alleviation of Instant Blood-mediated Inflammatory Reaction After Intraportal Islet Transplantation, Jingjing Wang, Zhen Sun, David B Adams, Katherine A Morgan, Hongjun Wang; Surgery, MUSC.

Session 10: Research Specialist / Technician I

183 Phosphorylation of Membrane Type-1 Matrix Metalloproteinase Regulates Cellular Localization in Primary Aortic Fibroblasts, Elizabeth K Nadeau[1], Adam W Akerman[1], Robert E Stroud[1], Rupak Mukherjee[1], Jeffrey A Jones[1], John S Ikonomidis[2]; [1]CT Surgery Research, MUSC, [2]CT Surgery, MUSC.

184 Markers of Adaptive Immunity Decline in Liver During Interferon-free Treatment of Chronic HCV Infection, But Do Not Differ By Treatment Outcome, Cody M Orr[1], Johannes Aartun[2], Shyam Kottilil[3], Eric G Meissner[1]; [1]Infectious Diseases, MUSC, [2]Oral Health Research, MUSC, [3]Human Virology, University of Maryland Medical School.

185 MicroRNA 204 Expression Disrupts Normal Lactation in the Mouse Mammary Gland, Lourdes D Nogueira, King Brooke, Findlay J Victoria; Pathology, MUSC.

186 Contribution of Hematopoietic Stem Cell-derived Osteoblasts in the Osteosarcoma Microenvironment, Uday K Baliga[1], Ying Xiong[1], Amanda C Larue[2], Meenal Mehrotra[2]; [1]Pathology, MUSC, [2]Research Services, Ralph H Johnson VAMC.

187 Presence of Hematopoietic Stem Cells Derived Cells in the Dental Pulp and Periodontal Ligament*,* Katie R Wilson[1], Ying Xiong[1], Amanda C LaRue[2], Meenal Mehrotra[2]; [1]Pathology and Lab Medicine, MUSC, [2]Research Services, Ralph H Johnson VAMC.

188 Chemokines Implicated in the Progression of High-Grade Serous Ovarian Carcinomas Overexpressing GAB2*,* Christopher M Duckworth, Lixia Zhang, Steven L Carroll, Stephen P Ethier, Hiu Wing Cheung; Pathology and Laboratory Medicine, MUSC.

189 MicroRNAs As Regulators of Senescence in the Cochlear Lateral Wall of Aged Mouse*,* Mary C Bridges[1], Robert G Keller[2], Yazhi Xing[1], Jeremy L Barth[3], Hainan Lang[1]; [1]Pathology and Laboratory Medicine, MUSC, [2]Otolaryngology-Head and Neck Surgery, MUSC, [3]Regenerative Medicine and Cell Biology, MUSC.

190 Informed Consent: Simplifying the Hollings Cancer Center (HCC) Biorepository Form*,* Brittany N Ferrigno[1], Robert M Sade[2], Andrea D Boan[1]; [1]Pediatrics, MUSC, [2]Surgery, MUSC.

191 Indentifying, Understanding, and Addressing Moral Distress*,* Allison A Bannon[1], Jennifer Baker[2], Robert M Sade[3], Andrea D Boan[1]; [1]Pediatrics, MUSC, [2]Philosphy, CofC, [3]Surgery, MUSC.

ORAL PRESENTATIONS

Colbert Education Center and Library

Session 11: Undergraduate II 1:15 – 3:00 pm EL 116

1:15 - 1:30

192 Oxygen Diffusion Based Optimization of Spheroid Size for Human Cardiac Repair, Jenny J Yao[1], Robert Coyle[2], Ying Mei[2]; [1]Academic Magnet High School, [2]Clemson-MUSC Bioengineering.

1:30 - 1:45

193 Roles for the Complement Anaphylatoxins C3a and C5a in Regulating Tumor Immunity Following Radiation Therapy, Colleen E Quaas[1], Merry Andersen[1], Andrea Whitfield[2], Andrew Ellis[3], Mario Fugal[3], Kenneth Vanek[3], Melissa Scheiber[1], Stephen Tomlinson[1]; [1]Microbiology and Immunology, MUSC, [2]Pediatrics, MUSC, [3]Radiation Oncology, MUSC.

1:45 - 2:00

194 An Examination of Multielectrode Array Recordings in the Nucleus Accumbens of C57Bl6 Mice, Rosamond M Goodson[1], Jacqueline M Barker[2], William B Glen[2], Lawrence J Chandler[2]; [1]Neuroscience, Wesleyan College, [2]Neuroscience, MUSC.

2:00 – 2:15 Break

2:15 - 2:30

195 Q12 NAC and 1,25-(OH)2Vitamin D3 Negatively Affects Weight and Behavioral Reflexes After LPS-HI Injury in the Neonatal Rat, Lauren E Adams[1], Danielle W Lowe[2], Andrew Barbour[2], Inderjit Singh[2], Dorothea Jenkins[2]; [1]Academic Magnet High School, [2]Pediatrics, MUSC.

2:30 - 2:45

196 Effects of TMS on Response to Cues in Different ROIs in Cocaine Addicts, Dawn H Jensen, Colleen A Hanlon; Psychiatry, MUSC.

2:45 - 3:00

197 Developmental Origins of Bicuspid Aortic Valves, Nicolas E Alcala[1], Josh Mifflin[1], Loren Dupuis[2], Sarah Thibaudeau[2], Kern B Christine[2]; [1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC.

Colbert Education Center and Library

Session 12: Clinical / Professional / Masters V 12:00 – 3:00 pm EL 103

12:00 - 12:15

198 Impedance pH and Esophageal Motility Findings in Chronic Cough Patients, Aimee C Weber[1], Emily M Green[1], Shaun A Nguyen[2], Lucinda A Halstead[2]; [1]College of Medicine, MUSC, [2]Otolaryngology-Head and Neck Surgery, MUSC.

12:15 - 12:30

199 Association of Vitamin D and Glucose Tolerance in Pregnant Women, Catherine A Boniface[1], Wei Wei[2], Judy R Shary[3], Myla D Ebeling[3], Nina E Forestieri[3], Bruce W Hollis[3], Carol L Wagner[3]; [1]MUSC, [2]Public Health, MUSC, [3]Pediatrics, MUSC.

12:30 - 12:45

200 Revascularization of Smokers with Claudication Does Not Limit Quality of Life Despite a Higher Risk of Late Failure, Joshua D Mixson[1], Thomas E Brothers[2]; [1]College of Medicine, MUSC, [2]Vascular Surgery, MUSC.

12:45 - 1:00

201 Ganoderic Acid DM As a Complementary and Alternative Therapeutic Agent for the Treatment of B-cell Lymphoma, John M Bryant, Mollie Bouchard, Natalie Sutkowski, Azizul Haque; Microbiology and Immunology, MUSC.

1:00 - 1:15

202 FCRL as a Target for Immunotherapy of B-cell Lymphoma, Mollie E Bouchard, Azizul Haque, Natalie Sutkowski, John Bryant; Microbiology and Immunology, MUSC.

1:15 - 1:30

203 The Role of Commensal Flora in Osteoclast Differentiation, Carolyn R Whittow, Chad Novince, Caroline Westwater, Keith L Kirkwood; Oral Health Sciences, MUSC.

1:30 – 1:45 Break

1:45 - 2:00

204 Transoral Robotic Surgery for Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis, Stephen C Miller[1], Adrian A Ong[2], M Boyd Gillespie[2], Shaun A Nguyen[2]; [1]Medicine, MUSC, [2]Otolaryngology, MUSC.

2:00 - 2:15

205 Predicting Motor Outcomes with 3 Month Prone Hip Angles in Premature Infants, Lindsey L Shehee[1], Andrew Barbour[2], Patty Coker-Bolt[3], Dorothea Jenkins[2]; [1]College of Medicine, MUSC, [2]Pediatrics, MUSC, [3]Occupational Therapy, MUSC.

2:15 - 2:30

206 T2* MRI Assessment of Hepatic Iron Distribution in Pediatric Patients with Sickle Cell Hemoglobinopathies, Hampton B Sasser[1], Heather Collins[2], Anil Rao[3]; [1]COM, MUSC, [2]Biomedical Imaging, MUSC, [3]Radiology, MUSC.

2:30 - 2:45

207 The Role of Antiphospholipid Antibodies in Valvular Heart Disease Among Patients with Systemic Lupus Erythematosus (SLE), Daniel Ruiz[1], Marian H Taylor[2], Diane L Kamen[3]; [1]College of Medicine, MUSC, [2]Cardiology, MUSC, [3]Rheumatology, MUSC.

2:45 - 3:00

208 The Co-occurrence of Traumatic Brain Injuries and Posttraumatic Stress Disorder in a Rolling Cohort of Veterans, Deep B Sangani[1], Leonard E Egede[2], Samir M Fakhry[3], Pamela Ferguson[3], Clara E Dismuke[4]; [1]MUSC, [2]Medicine, MUSC, [3]Surgery, MUSC, [4]Ralph H Johnson VA Medical Center.

Colbert Education Center and Library

Session 13: Clinical / Professional / Masters VI 12:00 – 2:45 pm EL 102

12:00 - 12:15

209 In Vitro Stimulation with TGF-β1 Accentuates Proliferative and Migratory Properties of Murine Thoracic Aortic Aneurysmal Fibroblasts, Richard D Williams, Elizabeth K Nadeau, Jason B Wheeler, Adam W Akerman, Rupak Mukherjee, Robert E Stroud, John S Ikonomidis, Jeffrey A Jones; Cardiothoracic Surgery, MUSC.

12:15 - 12:30

210 Transforming Growth Factor Beta 1 Signaling Through the Activin Receptor-Like Kinase-1 (ALK-1) Receptor: Role in the Formation of Thoracic Aortic Aneurysms, Ashley N Reluzco[1], Sarah Lieser[2], Elizabeth K Nadeau[2], Risha Patel[2], Robert E Stroud[2], Rupak Mukherjee[2], John S Ikonomidis[2], Jeffrey A Jones[2]; [1]College of Medicine, MUSC, [2]Cardiothoracic Surgery, MUSC.

12:30 - 12:45

211 Transaortic Coarctation (TAC) in Mouse Models, Kendrick Kennedy[1], Donald Menick[2], Kasiganesen Harineth[2]; [1]College of Medicine, MUSC, [2]Medicine, MUSC.

12:45 - 1:00

212 Environmental Detection of Bacillus Anthracis Spores Using 'bioluminescent' Reporter Bacteriophage, Cathy Nguyen[1], Natasha J Sharp[2], David A Schofield[2]; [1]Microbiology and Immunology, MUSC, [2]Guild BioSciences.

1:00 - 1:15

213 Ganoderic Acid (A and DM) Inhibits Tumorigenicity of Malignant Meningiomas Via NDRG2 Overexpression, Vikram N Samant, David Cachia, Scott M Lindhorst, William A Vandergrift III, Naren L Banik, Abhay K Varma, Sunil J Patel, Arabinda Das; Neurosurgery, MUSC.

1:15 – 1:30 Break

1:30 - 1:45

214 Prognostic Factors in Myoepithelial Carcinoma of the Major Salivary Glands, Marc Molarte P Camilon, Christopher C Xiao, Andrew B Baker, Terry Day; Otolaryngology, MUSC.

1:45 - 2:00

215 The Anti-Inflammatory Effect of Resveratrol in a Murine Model of Autoimmune Hepatitis, Catherine Dong, Venkatesh L Hegde, Mitzi Nagarkatti, Prakash Nagarkatti; Pathology, Microbiology, and Immunology, USCSM.

2:00 - 2:15

216 Effect of Coronary Artery Calcium on Outcomes in Patients Undergoing Lobectomy for Treatment of Lung Cancer, Joseph P Bethea, James Ravenel; Radiology, MUSC.

2:15 - 2:30

217 A Biodegradable Matrix for Endothelialization of 3-Dimensional Vascular Tubes, Michael Sarson[1], Robin Muise-Helmericks[1], Michael Yost[2], Steven Kubalak[1], Alexander Awgulewitsch[3], Richard Visconti[1]; [1]Regenerative Medicine and Cell Biology, MUSC, [2]Surgery, MUSC, [3]Medicine, MUSC.

2:30 - 2:45

218 Determining the Binding Constants of the OAR Domain of PRRX1a with Cofactors Using the Biacore System, R Sims Tompkins[1], Jim Tankersley[1], Michael Kern[2]; [1]Dental Medicine, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC.

Colbert Education Center and Library

Session 14: Clinical / Professional / Masters VII 12:00 – 2:15 pm EL 114

12:00 - 12:15

219 Potential Management Strategies To Treat Factitious Bacteremia, Balvir Singh, Rogers Kyle, Temeia Martin; Medicine, MUSC.

12:15 - 12:30

220 First Report of a Familial Mutation in ARID1B, Joshua A Smith[1], Kenton R Holden[1], Stephen McGee[2], Michael J Friez[2], Julie R Jones[2], Michael J Lyons[2]; [1]Neurology, MUSC, [2]Greenwood Genetic Center.

12:30 - 12:45

221 Familial Lipomyelomeningocele: a Case Report and Genetic Analysis, Thomas Larrew[1], Kenton Holden[2], Michael Lyons[3], Ramin Eskandari[4]; [1]Neurosurgery, MUSC, [2]Neurology, MUSC, [3]Greenwood Genetics Center, [4]Neurosurgery, MUSSC.

12:45 - 1:00

222 Influence of the Method of Fracture Repair on the Rate and Completeness of Bone Healing, E Lex Hanna, Yongren Wu, Robert Holmes, William Barfield, Vincent Pellegrini; Orthopaedics, MUSC.

1:00 – 1:15 Break

1:15 - 1:30

223 National Case Log Reports for Graduating Otolaryngology Residents: An Analysis of Data Trends From 2004-2014, Forest W Weir, Neil Simmons, Ted A Meyer; Otolaryngology, MUSC.

1:30 - 1:45

224 MicroRNA Mediated Negative Regulation of Caveolin 1 As a Biological Mechanism Driving Breast Cancer Disparities, Brooke D King[1], Qi Guo[1], Bobbie Blake[2], Amanda C LaRue[1], Judith D Salley[2], Marvella E Ford[3], Ashley Evans-Knowell[2], Victoria J Findlay[1]; [1]Pathology, MUSC, [2]SCSU, [3]Public Health Sciences, MUSC.

1:45 - 2:00

225 Race in the Role of DIEP Reconstruction and Its Effect on Outcomes, Brielle Weinstein[1], Thomas Pomposelli[2], Robinder Singh[1], Olivia Madan[3], McIver Leppard[1], Shayla Freeman[1], Melissa Allen[1], Patrick O'Neill[1]; [1]Plastic and Reconstructive Surgery, MUSC, [2]St. Elizabeth's Medical Center, [3]Plastic and Reconstrutive Surgery, Wake Forest University.

2:00 - 2:15

226 Differential Hypertensive Protease Expression In The Thoracic Versus Abdominal Aorta, Denise M Kimbrough[1], Jean M Ruddy[1], Adam W Akerman[2], Elizabeth K Nadeau[2], Robert E Stroud[2], Rupak Mukherjee[2], John S Ikonomidis[3], Jeffrey A Jones[2]; [1]Vascular Surgery, MUSC, [2]Cardiothoracic Research, MUSC, [3]Cardiothoracic Surgery, MUSC.

Colbert Education Center and Library

Session 15: PhD IV: Years 1-2 1:15 – 3:15 pm EL 118

1:15 - 1:30

227 Kallistatin Inhibits Endothelial-Mesenchymal Transition By Inhibiting MiR-21 and Oxidative Stress, and Stimulating ENOS/SIRT1 Expression*,* Youming Guo, Pengfei Li, Grant Bledsoe, Zhi-rong Yang, Lee Chao, Julie Chao; Biochemistry and Molecular Biology, MUSC.

1:30 - 1:45

228 Elucidating Hunk's Role in Regulating Autophagy Through Interaction with Essential Autophagy Complexes*,* Joelle N Zambrano, Elizabeth S Yeh, Melissa A Abt, Elizabeth G Hill; Cell and Molecular Pharmacology, MUSC.

1:45 - 2:00

229 Renal ERK1/2 Regulates PGC-1&Alpha and Mitochondrial Biogenic Homeostasis Physiologically and During Renal Injury*,* Justin B Collier, Ryan M Whitaker, Rick G Schnellmann; DDBS, MUSC.

2:00 - 2:15

230 Interrogating the Kinetics of Panobinostat for Development of Novel HDAC Inhibitors for Synergistic Use in Multiple Myeloma*,* Jesse J McClure, Cheng Zhang, Elizabeth Inks, James Chou; Biomedical Sciences and Drug Discovery, MUSC.

2:15 – 2:30 Break

2:30 - 2:45

231 Direct Effects of Nicotine Exposure on Cells of the Calvaria*,* Emily L Durham[1], R Nicole Howie[1], Laurel Black[2], Graham Warren[3], Amanda LaRue[4], James Cray[2]; [1]Oral Health Sciences, MUSC, [2]Oral Health Science, MUSC, [3]Radiation Oncology, MUSC, [4]Pathology and Laboratory Medicine, MUSC.

2:45 - 3:00

232 Bayesian Statistical Inference on Small Samples*,* Peter Greene, Caitlyn Ellerbe; Public Health, MUSC.

3:00 - 3:15

233 BCTS: A Python Module to Perform Bayesian Clinical Trial Simulation*,* Zhenning Yu, Caitlyn Ellerbe, Viswanathan Ramakrishnan; Biostatistics-Public Health Sciences, MUSC.

Colbert Education Center and Library

Session 16: PhD V: Years 3+ 12:00 – 3:00 pm EL 107

12:00 - 12:15

234 Ceramide Mediated Lethal Mitophagy: A Novel Cell Death Mechanism in FLT3 Targeted Therapy of Acute Myeloid Leukemia*,* Mohammed Dany, Besim Ogretmen; Hollings Cancer Center, MUSC.

12:15 - 12:30

235 Comparative Effectiveness Approach to Investigating the Relationship of Physical Activity and Post-Stroke Depression in Community Dwelling Adults, Ickpyo Hong[1], Stacey E Aaron[1], Annie N Simpson[2], Hee-Soon Woo[3], Moon-Young Kim[4], Craig A Velozo[5]; [1]Health Sciences and Research, MUSC, [2]Healthcare Leadership and Management, MUSC, [3]Medicine, Wonkwang University (Korea), [4]Occupational Therapy, Yonsei University (Korea), [5]Occupational Therapy, MUSC.

12:30 - 12:45

236 Hospital Readmissions for Stroke Patients with PEG Feeding Tubes: An Analysis of HCUP SID Florida 2012, Janina Wilmskoetter[1], Kit N Simpson[2], Heather S Bonilha[1]; [1]Health Sciences and Research, MUSC, [2]Healthcare Leadership and Management, MUSC.

12:45 - 1:00

237 Fine-Tuning Complement After Cerebral Ischemic Reperfusion Injury Using Site-Targeted Alternative Pathway Inhibition, Ali Alawieh[1], Hong Zhu[1], DeAnna Adkins[2], Stephen Tomlinson[1]; [1]Microbiology and Immunology, MUSC, [2]Neurosciences, MUSC.

1:00 - 1:15

238 Cocaine-Induced Activation of the STEP Phosphatase in the Dorsomedial Prefrontal Cortex of Rats During Early Withdrawal Facilitates Relapse to Cocaine-Seeking, Ben M Siemsen[1], Paul Lombroso[2], Jacqueline McGinty[1]; [1]Neurosciences, MUSC, [2]Medicine, Yale University.

1:15 - 1:30

239 Development and Age-Related Degeneration of the Nodes of Ranvier in Mouse Auditory Nerve, Clarisse H Panganiban[1], Nancy M Smythe[1], Yazhi Xing[1], LaShardai N Brown[1], Jeremy L Barth[2], Hainan Lang[1]; [1]Pathology, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC.

1:30 – 1:45 Break

1:45 - 2:00

240 NAD+ Levels in Astrocytes Modulate Motor Neuron Survival in a Model of ALS, Benjamin A Harlan, Marcelo Vargas; Pharmacology, MUSC.

2:00 - 2:15

241 Development, Safety, and Tolerability of Transcutaneous Auricular Vagus Nerve Stimulation (taVNS), A Novel Form of Noninvasive Vagus Nerve Stimulation, Bashar W Badran[1], Chloe E Gulsman[1], Alan W Badran[2], Chris Austelle[1], William H DeVries[1], Jeffrey J Borckhardt[1], Mark S George[1]; [1]Psychiatry & Behavioral Sciences, MUSC, [2]College of Engineering, SJSU.

2:15 - 2:30

242 The Toxicity Score Elicitation Method: A Statistical Approach to Constructing Continuous Toxicity Scores for Multiple Toxicities in Phase-I Oncology Clinical Trials, Nathaniel S O'Connell, Elizabeth Garrett-Mayer; Public Health Sciences, MUSC.

2:30 - 2:45

243 Classification and Regression Tree Modeling of Binary Outcomes for Datasets with Repeated Measurements, Jaime L Speiser, Valerie Durkalski, Bethany Wolf, Dongjun Chung; Public Health Sciences, MUSC.

2:45 - 3:00

244 Cilia and Their Function in Valve Development and Disease, Toomer A Katelynn, Sauls Kimberly, Johnson Amanda, Williams Katherine, Norris Russell; MUSC.

Colbert Education Center and Library

Session 17: PhD VI: Years 3+ 12:00 – 2:45 pm EL 115

12:00 - 12:15

245 Evaluating the Performance of Bayesian and Frequentist Design in Phase 3 Clinical Trial with Dichotomous Outcome, Jiang Yunyun, Durkalski L Valerie, Zhao Wenle; Public Health Sciences,MUSC.

12:15 - 12:30

246 The Association Between Family History of Skin Cancer and Risk of Other Malignancies and Death, James B Small[1], Anthony Alberg[2], Catherine Staples[3]; [1]Epidemiology, MUSC, [2]Hollings Cancer Center, MUSC, [3]DPHS, MUSC.

12:30 - 12:45

247 Mechanism and Role of CD24 in Oral Cancer Oncogenesis and Inflammation, Caroline Wallace Fugle[1], Yongliang Zhang[1], Feng Hong[1], Hong Yu[2], Shaoli Sun[3], Keith Kirkwood[2], Bei Liu[1], Zihai Li[1]; [1]Microbiology & Immunology, MUSC, [2]Oral Health Sciences, MUSC, [3]Pathology & Laboratory Medicine, MUSC.

12:45 - 1:00

248 Platelet-intrinsic GARP in TGFbeta Biology and Cancer Immunotherapy, Alessandra Metelli, Yongliang Zhang, Bei Liu, Zihai Li; Microbiology and Immunology, MUSC.

1:00 - 1:15

249 Speech Recognition in Realistic Listening Environments: Connecting Fragments of Speech Across Time, William J Bologna, Jayne B Ahlstrom, Judy R Dubno; Otolaryngology - Head and Neck Surgery, MUSC.

1:15 – 1:30 Break

1:30 - 1:45

250 Role of the Hematopoietic Stem Cell During Osteogenesis and Fracture Repair, Ryan R Kelly[1], Mary A McCrackin[2], Lee R Leddy[3], Amanda C LaRue[2]; [1]Pathology and Laboratory Medicine, MUSC, [2]Research Services, Ralph H. Johnson VAMC, [3]Orthopaedic Surgery, MUSC.

1:45 - 2:00

251 Macrophage-mediated Phagocytosis of the Auditory Nerve Contributes to Hearing Onset in the Developing Mouse Cochlea, LaShardai N Brown[1], Yazhi Xing[1], Clarisse H Panganiban[1], Jeremy L Barth[2], Hainan Lang[1]; [1]Pathology, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC.

2:00 - 2:15

252 Evaluating the Combination of Obesity and Diabetes on Death Following an Ischemic Stroke, Colleen E Bauza[1], Renee Martin[1], Marvella Ford[1], Anbesaw Selassie[1], Keith Borg[2], Gaynell Magwood[3], Sharon Yeatts[1]; [1]Public Health Sciences, MUSC, [2]Pediatrics, MUSC, [3]Nursing, MUSC.

2:15 - 2:30

253 Thoracic Aortic Smooth Muscle Cell Phenotype and Contractility Are Altered with Aging, Jason B Wheeler[1], Robert E Stroud[2], Rupak Mukherjee[2], John S Ikonomidis[2], Jeffrey A Jones[2]; [1]MCBP, MUSC, [2]Surgery, MUSC.

2:30 - 2:45

254 MicroRNA-133a Regulates Aortic Fibroblast Phenotype and Thoracic Aortic Aneurysm Formation, Adam W Akerman, Robert E Stroud, Adam N Franklin, Rupak Mukherjee, John S Ikonomidis, Jeffrey A Jones; Surgery, MUSC.

Colbert Education Center and Library

Session 18: PhD VII: Years 3+ 12:00 – 3:00 pm EL 109

12:00 - 12:15

255 HPV16-E7 Enhances Ceramide-Mediated Lethal Mitophagy By Regulating the Rb/E2F5/Drp1 Signaling Axis, Raquela J Thomas, Natalia Oleinik, Besim Ogretmen; Biochemistry and Molecular Biology, MUSC.

12:15 - 12:30

256 Formoterol Induces Renal Mitochondrial Biogenesis Through Gβγ-dependent Signaling, Robert B Cameron, Craig C Beeson, Rick G Schnellmann; Drug Discovery and Biomedical Sciences, MUSC.

12:30 - 12:45

257 Ubiquitination Mediates Arrestin Conformational Signature and Function Following Angiotensin Receptor Activation, Erik G Strungs[1], Louis M Luttrell[2]; [1]MCBP, MUSC, [2]Medicine, MUSC.

12:45 - 1:00

258 An Assessment of Phthalate Exposure in Pregnant Women From Charleston, SC, Abby G Wenzel[1], Lori Cruze[2], John Brock[3], Stephen Somerville[4], Allison Frey[5], Roger Newman[4], John Kucklick[6], Louis Guillette, Jr[4]; [1]Marine Biomedicine and Environmental Science, MUSC, [2]Biology, Wofford College, [3]Chemistry, Univ North Carolina Asheville, [4]Obstetrics and Gynecology, MUSC, [5]Biology, Texas Christian University, [6]Environmental Chemical Sciences Group, National Institute of Standards and Technology.

1:00 - 1:15

259 Targeting the Alternative Pathway of Complement to Improve Functional Recovery After Spinal Cord Injury, Narang Aarti[1], Atkinson Carl[1], Samanta Ray Supriti[2], Zhu Hong[1], Banik L Naren[1], Tomlinson Stephen[1]; [1]Microbiology & Immunology, MUSC, [2]Neuroscience, MUSC.

1:15 - 1:30

260 Culturing T Cells in N-Acetylcysteine Protects From Activation Induced Cell Death and Enhances Killing of Melanoma Cells, Matthew Scheffel[1], Gina Scurti[2], Patricia Simms[2], Elizabeh Garrett-Mayer[3], Michael Nishimura[2], Shikhar Mehrotra[4], Christina Voelkel-Johnson[1]; [1]Microbiology & Immunology, MUSC, [2]Surgery, Loyola University, [3]Biostatistics & Epidemiology, MUSC, [4]Surgery, MUSC.

1:30 – 1:45 Break

1:45 - 2:00

261 Changes in Dopamine D1 Receptor Function After Adolescent Intermittent Ethanol Exposure in Layer V Pyramidal Cells of the Prefrontal Cortex, Corrin Garr, Heather Trantham-Davidson, Judson Chandler; MUSC.

2:00 - 2:15

262 Transient Synaptic Potentiation in Nucleus Accumbens Shell Underlies Inhibition of Drug Seeking, Douglas J Roberts-Wolfe[1], Andrew W Motts[2], Cassandra D Gipson[1], Alexander CW Smith[1], Michael D Scofield[1], Kerry Wischusen[2], Peter W Kalivas[1]; [1]Neuroscience, MUSC, [2]CofC.

2:15 - 2:30

263 Assessing Type I Error and Sample Size Requirements of Multistate Markov Models for Panel Data - A Simulation Study, Christy N Cassarly[1], Renee' Martin[1], Marc Chimowitz[1], Edsel Peña[2], Viswanathan Ramakrishnan[1], Yuko Palesch[1]; [1]Public Health Sciences, MUSC, [2]Statistics, USC.

2:30 - 2:45

264 Childhood Brain Cancer in Florida: a Bayesian Clustering Approach, Chawarat Rotejanaprasert, Andrew Lawson; Public Health Sciences, MUSC.

2:45 - 3:00

265 Effect of Induction Therapy on Graft Survival in Primary Pediatric Heart Transplantation: A Propensity Score Analysis of the UNOS Database, Melanie L Davis, Ryan Butts, Andrew Savage, Ali Burnette, Minoo Kavarana, Scott Bradley, Andrew Atz, Paul Nietert; Public Health Sciences, MUSC.

Colbert Education Center and Library

Session 19: Postdoc / Resident / Fellow / Staff Scientist II 12:00 – 2:45 pm EL 121

12:00 - 12:15

266 KCa2 Channel Inhibition in the Infralimbic Prefrontal Cortex is Required for MGluR5-dependent Enhancement of Extinction of Alcohol-seeking Behavior and Synaptic Plasticity, Reginald Cannady, Justin T Gass, Patrick J Mulholland; Neuroscience, MUSC.

12:15 - 12:30

267 Potassium Channel Gene Regulation in the Prefrontal Cortex As a Basis for Investigating Novel Pharmacogenetics Therapies to Reduce Heavy Alcohol Drinking in Mice, Jennifer A Rinker[1], Diana B Fulmer[2], Marcelo F Lopez[3], Howard C Becker[3], Patrick J Mulholland[1]; [1]Neuroscience, MUSC, [2]Biomedical Sciences, MUSC, [3]Psychiatry and Behavioral Sciences, MUSC.

12:30 - 12:45

268 CTCE Improves Endothelial Cell Barrier Function in LPS-induced ALI Through Altering MicroRNA 126 Expression and Rac 1 Activation, Changrun Guo[1], Andrew J Goodwin[2], Joy A Buie[1], James V Cook[1], Perry Halushka[3], Kelley Argraves[4], Basilia Zingarelli[5], Hongkuan Fan[1]; [1]Neurosciences, MUSC, [2]Pulmonary, Critical Care, Allergy, and Sleep Medicine, MUSC, [3]Medicine, MUSC, [4]Regenerative Medicine and Cell Biology, MUSC, [5]Critical Care Medicine,Cincinnati Children's Hospital Medical Center.

12:45 - 1:00

269 Objective Outcomes of Supraglottoplasty for Laryngomalacia with Obstructive Sleep Apnea: a Meta-analysis, Zachary Farhood, Adrian A Ong, Shaun A Nguyen, M Boyd Gillespie, Christopher M Discolo, David R White; Otolaryngology, MUSC.

1:00 - 1:15

270 Demographics, Disparities, and Survival in Young Patients with Oral Cavity Squamous Cell Carcinoma, a Population-level Analysis of 3828 Cases, Elizabeth A Nicolli, Kevin Y Zhan, Terry A Day; Otolaryngology - Head & Neck Surgery, MUSC.

1:15 – 1:30 Break

1:30 - 1:45

271 Efficacy of Upper Airway Stimulation on Collapse Patterns Observed During Drug-induced Sedation Endoscopy, Adrian A Ong[1], Alexander W Murphey[1], Shaun A Nguyen[1], Ryan J Soose[2], B Tucker Woodson[3], Olivier M Vanderveken[4], Nico de Vries[5], M Boyd Gillespie[1]; [1]Otolaryngology, MUSC, [2]Otolaryngology, UPMC, [3]Otolaryngology, MCW, [4]Otolaryngology, Antwerp University Hospital, [5]Otolaryngology, Saint Lucas Andreas Hospital.

1:45 - 2:00

272 Transplanted Hematopoietic Stem Cells Form Functional Osteoblasts That Deposit Collagen and Repair Bone in Mouse Model of Osteogenesis Imperfecta, Inhong Kang[1], Makio Ogawa[1], Amanda LaRue[2], Meenal Mehrotra[2]; [1]Pathology and lab medicine, MUSC, [2]Research Services, Ralph H Johnson VAMC.

2:00 - 2:15

273 Across Time and Space: Using Independent Component Analysis to Characterize Spatial and Temporal Differences in Functional Neural Networks Between Cocaine and Alcohol Abusers, Tonisha E Kearney-Ramos, Logan Dowdle, Oliver Mithoefer, Chris Mullins, Will Devries, Mark S George, Colleen A Hanlon; Psychiatry and Behavioral Sciences, MUSC.

2:15 - 2:30

274 Impact of an Inpatient Tobacco Cessation Service, Georges J Nahhas[1], Kathleen Cartmell[2], Vince Talbot[3], Danny Woodard[4], Dianne Wilson[1], Graham Warren[5], Ben Toll[6], Micheal K Cummings[1]; [1]Psychiatry and Behavioral Sciences, MUSC, [2]College of Nursing, MUSC, [3]TelASK Technologies, Ottawa, [4]Tobacco-cessation, MUSC, [5]Radiation Oncology, HCC, MUSC, [6]HCC, MUSC.

2:30 - 2:45

275 Bariatric Radiation Therapy (BaRT) for Ghrelin Suppression and Weight Loss: Proof of Concept in Porcine Model, Austin C Bourgeois[1], Yong C Bradley[2], Jimmy Liu[1], Aravind Arepaly[3], Laurentia Nodit[2], Marcelo S Guimaraes[1], Patricia N Coan[2], Alexander S Pasciak[4]; [1]MUSC, [2]Univ of Tennessee, [3]Piedmont Health, [4]Johns Hopkins.

Colbert Education Center and Library

Session 20: Postdoc / Resident / Fellow / Staff Scientist III 12:00 – 2:30 pm EL 113

12:00 - 12:15

276 PBP3 is the Only Essential High Molecular Mass PBP in Pseudomonas Aeruginosa, Wei Chen, Christopher Davies; Biochemistry, MUSC.

12:15 - 12:30

277 Tranexamic Acid Decreases Blood Loss Following Total Shoulder Arthroplasty, Eric R Gordon, Bryan Butle, Lisa Mock, Bonnie Dumas, Richard Friedman; Orthopaedics, MUSC.

12:30 - 12:45

278 Using An Item Bank to Measure Activity of Daily Living Across Facilities: Comparing Measurement Precisions of Short Forms in Veterans, Chih-Ying Li[1], Sergio Romero[2], Kit N Simpson[3], Annie N Simpson[3], Heather S Bonilha[1], Ickpyo Hong[1], Craig A Velozo[4]; [1]Health Sciences and Research, MUSC, [2]Occupational Therapy, University of Florida, [3]Healthcare Leadership and Management, MUSC, [4]Occupational Therapy, MUSC.

12:45 - 1:00

279 First Generation CAR-T Therapies Can Be Rendered Therapeutically Effective When Engineered Into a Novel Human Memory CD4+ T Cell Subset, Michelle H Nelson, Stefanie Bailey, Jacob Bowers, Kinga Majchrzak, Logan Huff, Chrystal Paulos; Microbiology and Immunology, MUSC.

1:00 - 1:15

280 Improving Adoptive T Cell Transfer Mediated Melanoma Immune Therapy By Targeting Gp96/grp94 in Regulatory T Cells, Yongliang Zhang[1], Mark Rubenstein[2], Bei Liu[1], Zihai Li[1]; [1]Microbiology & Immunology, MUSC, [2]Surgery, MUSC.

1:15 – 1:30 Break

1:30 - 1:45

281 The Oral Commensal Flora, a Dynamic Regulator of Alveolar Bone Remodeling, Chad Novince, Carolyn Whittow, Michael Chavez, Caroline Westwater, Keith Kirkwood; Oral Health Sciences, MUSC.

1:45 - 2:00

282 Utilization Percentage of Computer-Assisted Total Knee Arthroplasty Displays Wide Variation By Geographic Location, Robert E Holmes[1], Keith Orland[1], Kit Simpson[2], Jacob Drew[1]; [1]Orthopaedics, MUSC, [2]Health Science Research, MUSC.

2:00 - 2:15

283 Is the C2 Spinous Process Efficacious As an Intraoperative Indicator for Avoidance of the Vertebral Arteries During Posterior Cervical Arthrodesis? Andrew B Pham, Emily Green, Eric Belin, William Barfield; Orthopaedics, MUSC.

2:15 - 2:30

284 A Custom App Provides Reliable Finger Measurement Faster Than A Goniometer, Jeremy C Smalley, Eric W Angermeier, William R Barfield, Kyle P Kokko; Orthopaedics, MUSC.

001 Isolation and Identification of Pseudomonas Aeruginosa Bacteriophages From Sewage

Conor W Templeton[1], Darren J Wray[2], Natasha J Sharp[2], David A Schofield[2]; *[1]MUSC, [2]Guild BioSciences*.

Abstract not available.

002 A Role for the Extracellular Matrix Protease ADAMTS5 in Cardiovascular Development

Lockett Nelson[1], Sarah Thibaudeau[2], Loren Dupuis[2], Christine B Kern[2]; *[1]Biology, CofC, [2]Regenerative Medicine and Cell Biology, MUSC*.

Abstract not available.

003 The Neurovascular Effect of Type 2 Diabetes Mellitus on Alzheimer's Disease

Sarah A Harrill[1], David Hartmann[2]; *[1]CofC, [2]MUSC*.

Previous research shows that individuals with type 2 diabetes mellitus (DM2) are at an increased risk to develop Alzheimer's disease (AD). Autopsy analyses suggest that vascular damage due to DM2 may predispose patients to AD. We used the PDAPP transgenic mouse model in combination with a non-genetic DM2 model to investigate how DM2 affects the neurovascular unit in AD. In a third group, the vascular inflammation, induced by diabetes was inhibited by 5A, a small apolipoprotein A1 mimetic peptide. In vivo two photon microscopy was used in order to look at the potential causes and effects of neurovascular damage. There was no difference between the DM2 mice from the control mice in leukocyte rolling or plaque buildup. However, arteriole plaque burden was correlated with leukocyte rolling in the control and DM2 groups. Interestingly, plaque deposition and leukocyte rolling were not correlated for the 5A group, which suggests plaque deposition precedes vascular inflammation. Since 5A suppressed vascular inflammation even when vascular plaque was present, 5A may prove to be an effective vasculoprotective drug.

004 Developmental Compound E61 Overcomes Proteasome Inhibitor Resistance in Multiple Myeloma and Mantle Cell Lymphoma Cells

Brittany Smith[1], Leticia Reyes[2], Jesse McGlure[2], James Chou[3], Nathan Dolloff[2]; *[1]College of Charleston, [2]Cell and Molecular Pharmacology & Experimental Therapeutics, MUSC, [3]Pharmacy, MUSC*.

Abstract not available.

005 TGFβ1 Regulates Hyaluronan Receptor CD44v6 Through EGR1 in Lung Myofibroblasts

William C Dowling[1], Ilia Atanelishvili[2], Vincent C Hascall[3], Shibnath Ghatak[4], Suniti Misra[4]; *[1]Biology, College of Charleston, [2]Medicine, MUSC, [3]Cleveland Clinic, [4]Regenerative Medicine and Cell Biology, MUSC*.

Background: Increase in TGFβ1 results in activation of the CD44v6-hyaluronan pathway and leads to activation of myofibroblasts that accumulate at sites of tissue remodeling in lung fibrosis (Ghatak et al. J. Biol. Chem, 2014). Early growth regulated gene 1 (EGR-1) is a 80–82-kD inducible zinc finger transcription factor (Khachigianet.al. Science, 1996). The EGR1-binding site is located at CD44v6 promoter. Thus, we focused on transcriptional mechanisms mediated by TGFβ1 and its contribution to earlier regulatory processes by EGR1 which may be a mediator for TGFβ1 stimulated CD44v6 expression. Methods: Using isolated fibroblast cultures from the lung tissues from saline treated mice and murine model of lung fibrosis we investigated the potential role of TGFβ1/EGR1/CD44v6 pathway in the regulation of myofibroblast activation in lung injury. Results: The results indicate that EGR1-1 is required for TGFβ1-mediated CD44v6 up-regulation. ERK1/2 regulates TGFβ1-increased EGR1 and CD44v6. Moreover, EGR1 regulates CD44v6 promoter activity through activator protein-1 (AP-1) transcription factor Conclusions: The interaction of TGFβ1-induced EGR1 mediated AP-1 facilitates CD44v6 gene promoter regulation. Since TGFβ1 is a key cytokine to induce lung fibrosis (Santana et.al. Am J Respir Cell Mol Biol. 1995), these studies support a function for EGR1 and CD44v6 in lung tissue fibrogenesis. *NIH R03 CA167722*

006 Cell Autonomous Requirement of BMP2 in the Nfatc1 Endocardial Lineage for AV Cushion Remodeling and Mitral Valve Formation

Barton A Julie[1], Jacob Saxon[1], Travis Hawkins[1], Thomas Trusk[2], Stephen Harris[3], Bin Zhou[4], Yukiko Sugi[2]; *[1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC, [3]University of Texas Health Science Center at San Antonio, [4]Albert Eistein College of Medicine*.

Valvuloseptal defects are among the most common and serious congenital heart defects (CHDs). In the atrioventricular (AV) canal, mesenchymalized AV endocardial cushions undergo distal outgrowth /elongation, fusion and remodeling into the membranous ventricular septum and AV valves. BMPs function via cognate Type I and II receptors. In our previous studies, we demonstrated that BMP2 and BMP type I and type II receptors were expressed in the AV endocardial cells and their progeny, endocardial cushion cells. Based on the expression pattern we hypothesize that autocrine BMP signaling in the endocardial lineage plays a critical role in AV endocardial cushion remodeling and

valvuloseptal morphogenesis. To study the role of BMP-2 in AV endocardial cushions, we used a cre-driver line, Nfatc1Cre that confers cre-mediated recombination specifically within the endocardial cells and their mesenchymal progeny. No recombination was detected in the vascular endothelial cells, cardiac fibroblasts or cardiomyocytes with the Nfatc1Cre diver line. Using Nfatc1Cre driver line, we generated BMP-2fx/-; Nfatc1Cre (referred to as BMP2 cKOEndo) to determine the role of BMP-2 in the endocardium and endocardial cushions. BMP-2cKOEndo mouse embryos exhibited perimembranous ventricular septal defects at ED16.5 and mitral valve dysplasia after birth with nearly 100 % penetrance. Proliferation ratio analyzed with anti-phospho Histone H3 was not significantly altered in BMP2 cKOEndo mouse embryo hearts. Cell death detected by the TUNEL assay was not increased in BMP2 cKOEndo hearts. However, a transcription factor, Sox9, which is known to regulate mesenchymal cell linage in the endocardial cushion cells, was significantly reduced in the BMP2 cKOEndo AV endocardial cushions. BMP2 cKOEndo mouse hearts also exhibited defective deposition of extracellular matrix components in the AV endocardial cushions and prevalvular mesenchyme. Our data suggest cell autonomous requirement of BMP2 in the endocardial lineage for remodeling of the AV endocardial cushions into perimembranous ventricular septum and mitral valves. *AHA 15GRNT25710305*

007 Origins of Bicuspid Aortic Valve

, Josh J Mifflin[1], Nic Alcala[1], Loren Dupuis[2], Christi Kern[2]; *[1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC*.

Bicuspid aortic valve disease is a condition that can require minimally invasive treatment for repair or replacement. Our lab has developed a mouse model to look at the etiology of formation of this bicuspid versus tricuspid aortic valve. Ongoing research focused on embryonic heart valve development suggests ADAMTS5 mediated versican cleavage is necessary for the normal development of pulmonary and aortic cardiac valves. Amira™ software three-dimensional reconstructions of the outflow tract of the developing heart at E12.5 were generated. Reconstructions were generated from approximately 50 confocal images of immunolocalization of versican to mark the endocardial cushions and alpha sma to mark the transient muscle. Preliminary data of the three-dimensional reconstructions of two samples (ADAMTS5 +/+, pSmad +/- and ADAMTS5 -/-, pSmad +/-) indicate the development of two endocardial cushions of abnormal shape and size in the ADAMTS5 deficient sample. Quantification of the markers shows a notable increase in overall mesenchymal tissue in this sample. In addition there was a reduction in the muscle marker infiltrating the mesenchyme for proper formation of the endocardial cushions when compared to the control. Further research will require a greater sample size of comparable control littermates utilizing selective intergenetic crossing. By exploring the tissue-tissue interactions and cell behavior, we may be able to discover the causes of specific abnormalities that could lead to more effective treatment options for heart valve diseases. *NIH*

008 Role of Oxytocin in Alcohol Seeking Behavior

, O K Roberson[1], C E King[2], W C Griffin[2], J F McGinty[2], H C Becker[2]; *[1]College of Charleston, [2]Neurosciences, MUSC*.

Alcohol-abuse is the third-leading cause of preventable death in the US (NIAAA, 2015). Excessive consumption of alcohol is known to cause significant social deficits including social isolation and loss of jobs. The few successful pharmacological treatments that exist for alcoholics and drug addicts, programs such as AA and NA, incorporate strong social support systems (Carson, 2014). The neuropeptide oxytocin (OXT) is known to be important in mediating social interactions such as maternal bonding, sexual and affiliated behavior, and anxiety-related behavior. The oxytocin system has emerged as a potential therapeutic target for treating a multitude of mental illnesses including schizophrenia, autism, anxiety, depression, post-traumatic stress disorder and drug abuse. The purpose of this study is to examine a role for oxytocin in motivation for alcohol seeking. We use a progressive ratio schedule to determine how hard an animal is willing to work for an alcohol reward Analysis by repeated-measures ANOVA revealed a significant main effect ($F(1, 15) = 6.457$, $p < .05$; Fig 1) of oxytocin on cumulative lever pressing during the progressive ratio session. Student's T-test indicated that oxytocin treatment (1mg/kg) significantly decreased average session length compared to vehicle condition ($t(15)=2.27$, $p=0.038$, Fig.2). Similarly, results show that active lever responses were significantly decreased ($t(15)=2.38$, $p=0.032$, Fig. 3) following oxytocin treatment. Additionally, treatment with oxytocin resulted in a significantly lower average breakpoint ($t(15)=2.74$, $p=0.015$, Fig. 4) Combined, these results suggest that oxytocin decreases motivation for ethanol reinforcers in a progressive ratio paradigm. *NIAAA P50 AA1076, U01 AA014095, DOD W81XWH 12-2-0048, 803-94 and VA Medical Research*

009 Predictors of Weight Perception Accuracy Among Obese Children and Adolescents

, Laura E Haselden[1], Melissa Henshaw[2], Janet Carter[3], Molly Jones[3], Diane M DellaValle[4]; *[1]College of Medicine, MUSC, [2]Pediatric Cardiology, Children's Hospital of South Carolina, [3]Children's Heart Health Program of South Carolina, [4]Nutrition and Dietetics, Marywood University*.

Pediatric obesity has become a public health epidemic, but many overweight and obese children consider their weight normal. While having peers and family members that are overweight or obese further reduces the likelihood of overweight or obese children correctly self

identifying as overweight, correct identification of current body weight status is necessary to initiating behavior change. The objective of this study was to explore the demographic factors related to children's perceptions of current body weight status. This cross-sectional study included data from 124 obese children and adolescents (n=81 female, 43 male) ages 4-20 years, attending MUSC's Heart Health Program. Thirty-nine percent of the sample accurately categorized their weight status; accuracy did not differ by gender or race. Older children (>12.1 y) were more likely to accurately perceive their weight than younger children (r=0.26, p=0.004), and older girls were more accurate than older boys (p=0.03). Relatively larger children were also more likely to accurately perceive their weight (r=0.21, p=0.02). Logistic regression analyses revealed that after controlling for BMI-for-age percentile, older girls had a 1.5 times higher likelihood of accurately perceiving their weight status compared to all other children (p=0.069 for the gender-by-age interaction). In a cohort of obese children and adolescents, boys and younger girls are less likely to correctly identify their body weight status. An individualized approach should be taken during clinic visits to address children's weight status and behavior change strategies for weight loss. *ULI TR000062*

010 Evaluating Internet-Based Intervention to Manage Hypertension Among African-Americans

, Leah D Snipe[1], Daniel T Lackland[2]; *[1]Medicine, MUSC, [2]Neurology, MUSC*.

Hypertension is one of the leading causes for visits to the doctor's office and a leading risk factor for high-mortality conditions, such as stroke and heart failure. One of the main issues maintaining the high prevalence of uncontrolled hypertension is non-adherence to physician-recommended treatments. There is growing evidence that increasing patient self-efficacy can lead to better outcomes and better adherence to treatment regimens. At the same time, there is growing prevalence and ease of internet use, which provides exciting opportunities for new interventions that can be largely patient-initiated and -led. Home Blood Pressure Monitoring (HBPM) is one mode of self-efficacy that has been shown to improve treatment adherence in hypertensive patients, and websites that allow patients to track their BP and receive feedback and advice already exist. Internet-based interventions are increasingly being developed and tested, but more research needs to be done on how to make these interventions most effective. This study surveyed internet-users with hypertension to evaluate current attitudes towards HBPM and what kind of website would best cater to their needs. The results of this survey can then be used to test the feasibility of certain website features in increasing compliance with HBPM and other health behaviors. *NIH R25 HL096316*

011 Culturally Sensitive Interventions for Improving Stroke Recovery Among African Americans

, Kemi M Chukwuka[1], Daniel Lackland[2]; *[1]College of Medicine, MUSC, [2]Neurology, MUSC*.

While it have been long recognized the excess disease burden for African Americans with regards to stroke incidence and mortality, the factors associated with the disparities in stroke recovery are less known. In addition to issues of stroke severity and disability, social factors such as transportation contribute the level of stroke recovery. The aim of this preliminary study effort was to develop a culturally sensitive mechanism and tool to collect and analyze data and parameters in African American patients with a stroke. Stroke patients were identified from discharge summaries and were interviewed regarding potential barriers to recovery clinical services. Further, opinions, religious/spiritual beliefs and practices attitudes and knowledge regarding stroke risks and recovery processes were de, scribed. These data will be compiled in a stroke recovery patient assessment tool to be piloted for studies on stroke recovery in African Americans. The ultimate goal is the development of culturally sensitive interventions that can be implemented to reduce the disparities in stroke recovery among African Americans. *Summer Health Professionals Program; NIH*

012 Physician Attitudes and Experiences Regarding Communication with Other Specialties

, Mason T Turner[1], R Neal Axon[2]; *[1]College of Medicine, MUSC, [2]Ralph H Johnson VAMC*.

Despite wide-held belief that health information exchange (HIE) would improve healthcare quality, development and implementation of these systems are faced with barriers. Understanding the attitudes of physicians concerning the role and implementation of an HIE is crucial to ensure optimal utilization. In order to design a user-centered HIE, our research team surveyed physicians regarding aspects of their inter-professional communication and desired features of a nascent HIE. We distributed and collected survey questionnaires to three groups of physician participants practicing in the Lowcountry area of coastal South Carolina: a) Emergency physicians (n=36) b) Primary care physicians (n=8), and c) specialty physicians (n=9) Responses were tabulated and entered into the REDCap Survey system for analysis. In all groups of physicians, the proportion that predicted they would use an HIE at least once per week (EDP 94%; PCP 75%; SCP 88.9%) was higher than the proportion currently attempting to contact other physicians at the same rate (EDP 69.5%; PCP 37.5%; SCP 66.7%). The mean number of hospitalizations physicians predicted could be avoided with an appropriate HIE ranged from 18.79% (EDP) to 31.63% (PCP). When selecting useful features of an HIE, ED and Specialty physicians preferred the ability to acquire medical records from the PCPs (EDP

88.9%; SCP 100%). ED physicians also selected the ability to request a follow up with PCPs (88.9%). PCPs preferred the ability to receive notifications that the patient was seen in the ED (87.5%). The physicians surveyed believed that implementation of an appropriate HIE could increase communication between providers and decrease hospitalizations. A HIE with a web based portal that provided access to medical records, allowed for notification of specialty and ED care to the PCP, and facilitated follow-up would meet the desires of most physicians, however the respective groups of physicians would utilize this tool for different purposes. *Summer Health Professionals T35*

013 Hypertension Awareness in a Hispanic Church

, Carlos A Sanchez, Daniel Lackland; *MUSC*.

Abstract not available.

014 The Impact of Vitamin D Status on Perceived Stress During Pregnancy Among Various Racial Groups

, Reona K Broadwater[1], Makeira Simmons[1], Wei Wei[2], Myla Ebeling[2], Judith Shary[2], Carol L Wagner[2]; *[1]COM, MUSC, [2]Pediatrics, MUSC*.

Background: Accumulation of psychological stress in expecting mothers can possibly lead to deficits in fetal personality, reduced birth weight, and even preterm birth. The effects may result from the interactions of hormones and their receptors, vitamin D being the focus here. Objective/Hypothesis: This purpose of this preliminary clinical trial was to determine the impact of vitamin D [25(OH)D] status on perceived stress during pregnancy among various racial groups. Methods: The first 250 women participating in the Kellogg Foundation Vitamin D during Pregnancy Project were to be included in the preliminary analysis of vitamin D and its effect on perceived stress during pregnancy. Cohen's perceived stress scale (PSS-10) was used to collect stress levels of the women for visits 2, 5, and 7. Statistical analysis were performed using SAS 9.3 software. Results: There were 250 women initially enrolled in this randomized controlled trial when PSS-10 was available. For all women, significant interaction terms were present between marital status, insurance, and race, marital status, insurance, and race at visit 2. By visit 7, race was the only sociodemographic factor that maintained significant value over PSS. When adjusting for race, higher total circulating 25(OH)D was associated with lower perceived stress scores (p=0.038). Over the span of their visits, African American women had a higher PSS compared to the Caucasian and Hispanic women, regardless of their 25(OH)D status. Conclusions: In this preliminary analysis, vitamin D status was associated with perceived stress, a finding which persisted even after controlling for race. this is the first randomized controlled vitamin D dose response study of pregnant women that ascertained maternal perceived stress and its correlation to serum 25(OH)D as related to race. Further studies are warranted to explore the distinct relationship between vitamin D and perceived stress. *Kellogg Foundation; NIH UL1 TR000062*

015 FLOSS - Facilitating Long-term Oral Health ServiceS

, Sarah M Biggers[1], Jarvetta Heyward[1], Sam Caruso[2], Amy Martin[1], Renata Leite[1]; *[1]College of Dental Medicine, MUSC, [2]Clemson University*.

Abstract not available.

016 Pathways for the Relationship Between Diabetes Distress, Depression, Fatalism and Glycemic Control in Adults with Type 2 Diabetes

, Christopher C Asuzu[1], Rebekah Walker[2], Joni Williams[3], Leonard Egede[3]; *[1]College of Medicine, MUSC, [2]Ralph H. Johnson VAMC, [3]Center for Health Disparities Research, MUSC*.

Background: Social determinants of health are defined as the socioeconomic and psychosocial conditions in which individuals are born, work, and live that influence the presence of health problems such as diabetes. Depression, diabetes-related distress, and diabetes fatalism are among three psychosocial factors that have been shown to individually influence diabetes outcomes. Consideration of mechanisms, while taking these variables into account, are important for the development of interventions. The objective of this study was to find the mechanism by which these variables exert their influence on self-care behavior and diabetes outcomes. Methods: 615 adults were recruited from adult primary care clinics in the southeastern United States. Structured equation modeling (SEM) was used to investigate the mechanism through which psychosocial factors (fatalism, diabetes distress, and depression) influenced self-care and glycemic control. Results: Latent variables were created for fatalism, diabetes distress, depression, and self-care. The final model (chi2 (903)=2408.9, p<0.001, RMSEA=0.05, CFI=0.90) showed higher diabetes distress (0.30, p<0.001) was associated with higher glycemic control and lower self care (-0.47, p<0.001). Higher fatalism was associated with higher depression (0.44, p<0.001) and higher distress (0.17, p<0.001). Higher depression was associated with higher distress (0.64, p<0.001). Conclusion: Based on these results, diabetes distress is the pathway through which fatalism and depression influence diabetes self-care and glycemic control.

017 Correlating Early Motor Skills to White Matter Abnormalities in Preterm Infants Using Diffusion Tensor Imaging

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Infants with minor and moderate white matter brain injury typically do not receive early intervention services until 12 to 18 months, well after maladaptive motor movements become fixed developmental delays. Early identification and initiation of therapy services could ameliorate abnormal muscle tone and prevent maladaptive motor movements from becoming permanent deficits. A promising indicator of future neurodevelopmental impairment is the combination of motor testing with neuroimaging. Diffusion Tensor Imaging (DTI) measures axonal organization in the brain using tissue water diffusion rates leading to Fractional Anisotropy (FA) values (directionality of water movement). The overall goal of this study is to determine the association between explicit measures of brain injury (DTI FA values) to early infant movement patterns at three months corrected age (CA) in a cohort of at-risk premature infants. We hypothesized that DTI FA values in white matter tracts will be lower in those infants with below average scores on the Test of Infant Motor Performance (TIMP) and the Specific Test of Early Infant Motor Performance (STEP). We reviewed existing data on preterm infants (n=26) to compare the Diffusion Tract Profile with scores on two motor tests at 12 weeks. We compared FA values in gross white matter structures, as well as voxelwise statistical analysis of FA microstructures using Tract-Based Spatial Statistics (TBSS) at the $p<0.05$ significance level. TBSS analysis was based on a dichotomized grouping of normal (>95 on 3 month TIMP motor assessment; n=13) versus at-risk (≤95 on 3 month motor assessment; n=13) infants. Significant group differences were seen in FA values of normal versus at-risk infants in the inferior longitudinal fasciculus, inferior fronto-occipital fasciculus, and the posterior limb of the internal capsule ($p=0.05$). Understanding the association between neonatal brain injury and early abnormal movement could lead to earlier identification of at-risk infants. *SCTR UL1TR000062*

018 Can Muscle Groups Account for Activities of Daily Living Challenge?

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Purpose: The purpose of this study was to investigate if the number of essential muscle groups recruited during activities of daily living (ADLs) is a critical determinant of ADL challenge. Hypothesis: We hypothesized that number of muscle groups recruited would account for similar amounts of variance in ADL challenge represented in the Stroke Impact Scale (SIS) and Functional Independence Measure (FIM™). Rationale/Background: Previous research demonstrated a significant correlation between the number of muscles recruited and ADL challenge on the SIS-ADL instrument, but not on the ICF-Activity Measure. Differences in ADL tasks may have produced discrepant results. Methods: Assessments with similar tasks were chosen. Six student raters evaluated number of essential muscle groups (shoulder & arm, wrist & hand, and lower extremity) involved in completing ADLs. Number of muscle groups was correlated with ADL challenge obtained from published literature. Results: Interrater correlation was 0.95-0.97. The correlation between FIM ADL challenge and number of muscle groups was weak, $p = .57$, with only 3% of the variance explained by number of muscle groups. The correlation between SIS ADL challenge and number of muscle groups was moderate, $p =.011$, with 38% of the variance explained by number of muscle groups. Discussion: Although two similar ADL instruments were used, number of muscle groups was not a common factor in explaining ADL challenge for the FIM and SIS. Number of muscle groups accounted for significant amounts of variance for the SIS but not the FIM. Two factors may have contributed to the discrepancy in the findings: 1) the different number of lower extremity (LE) and upper extremity (UE) items between assessments and 2) LE muscle groups may have been underrepresented in our scoring criteria. Finally, muscle groups may be a proxy to an underlying physiological mechanism that could explain ADL challenge more consistently.

019 Guided Movement and Play Program for Premature Infants (GMAPP): Engaging Families in the Early Intervention of At-risk Infants

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Although South Carolina Early Intervention (EI) provides services for over 5,000 children birth to three who are at-risk for developmental delays, initiation of services is not until 2 years on average, meaning we are missing a critical window of growth and development. To promote early skill development in at-risk infants, studies have investigated the use of parent-led home programs initiated shortly after discharge from the nursery. Such programs guide parents and infants through pivotal motor milestones to maximize early development. While studies have shown a high level of heterogeneity between different infant home motor programs, several key recommendations emerged: a focus on equal parent and therapist roles in implementing the programs, treatment driven by goals catered to individual infants, and parental involvement in the goal development. The

8-week Guided Movement and Play Program for Premature Infants (GMAPP), includes 6 motor and play activities developed by the University of Delaware. GMAPP is a unique systematic parent-led home movement program with the addition of individually tailored goals for each infant. The purpose of this prospective study was to evaluate GMAPP, in terms of effectiveness, parental compliance, and satisfaction. The Test of Infant Motor Performance (TIMP) was administered on a cohort of preterm infants at term corrected age (CA) to identify those at-risk for motor delays (n=6). Parents were instructed on the administration of GMAPP and provided instructions to follow at home. Parental compliance was assessed via weekly checklists and changes in infant motor performance was determined by attainment of individualized goals and TIMP testing at 12-weeks CA. Parents were satisfied overall with the home program which was perceived as an important influence on their infant's development. Follow up studies with a larger sample of infants are needed to assess GMAPP's overall impact on long-term development. *SCTR UL1 TR000062*

020 E-learning Innovations: Developing and Evaluating the Effectiveness of an Interactive E-learning Module

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Introduction: The purpose of this study was to assess student retention of knowledge and satisfaction when using interactive online modules compared to recorded lab sessions. Methods: Class of 2015 (CO2015) occupational therapy (OT) students received access to optional recorded lab sessions followed by a long-term (LT) retention test and satisfaction survey. Class of 2016 (CO2016) OT students received access to optional online modules and use of modules was tracked. CO2016 took a pre-test, short-term (ST), and LT retention test along with a satisfaction survey. Results: Based on satisfaction surveys, students who accessed online modules were more likely to report that this study tool helped them prepare for the practical and increased their confidence compared to students who accessed lab recordings. Further, students who accessed the modules were more likely to report easy access to the information and recommended continuation of usage of the modules compared to the lab videos. Despite higher instances of satisfaction with the modules, there was not a significant change in LT retention scores between the two classes. But CO2016 LT retention scores did improve by greater than 50% compared to pre-test scores. Interestingly, students used the modules more than twice as often prior to a practical vs. prior to a lab session. Conclusion: Although LT retention scores did not change between groups, students were highly satisfied with the modules and recommended that their use continue. Retention scores may be improved if students were held accountable to reviewing the content prior to lab rather than reviewing all information prior to a practical. Future studies should focus on the use of this kind of e-learning tool in a flipped classroom design in which students are held accountable for learning prior to lab. *MUSC Health Professions; Interdivisional-Interdepartmental-Intercollege Seed Grant Program*

021 Metabolic Equivalent As an Underlying Component of Quality of Life Measures

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Introduction: The purpose of this study was to determine if metabolic equivalent (MET) contributes as a significant factor in quality of life (QoL) measures. While different critical QoL measures include activities of daily living (ADL) items, such as the SF-36, it is not possible to translate scores across those measures. Identifying an underlying ADL measurement model would allow for translation of scores across QoL measures improving communication between disciplines and research studies that use different measures. We hypothesized that MET values are a significant component in an underlying model for QoL measures. Methods: This study used published Rasch item calibrations from the 13 ADL items of the Functional Independence Measure (FIM™) motor items and 16 ADL items of the Stroke Impact Scale (SIS) physical activity domain as the dependent variable in two regression models, one for the FIM and one for the SIS. The MET values for ADL items were used as the independent variables. The Rasch item difficulty values and MET values were retrieved from published papers (Ainsworth et al., 2000; Duncan et al., 2002; Lundgren-Nilsson et al., 2005). Results: Our hypothesis was supported by MET values being significant factors in the two regression models. For the FIM model, MET values explained 37% of variance ($p = .03$). For SIS model, MET values explained 50% of variance ($p = .003$). Conclusions: The significance of the MET in the regression models for the FIM and SIS supports our hypothesis that there is a common measurement model for QoL measures. Identifying an underlying ADLs would allow for translation of scores across these measures improving communication between disciplines and research studies that use different QoL measures. Future studies are needed to replicate these findings in other QoL measures.

022 Barriers for Young, Hypertension-Prone African American Women in Home Blood Pressure Monitoring

, Chelsea C Wrght, Daniel T Lackland; *Neurology, MUSC*.

Blood pressure issues were once more concerning for older adults, but most recently, this has been a pressing concern for adults of all ages, both young and old. Our diets have become so saturated with sodium that these

issues now plague individuals a lot earlier in life. This paper will take a look at whether young African American women of ages 21-35 will begin to take proactive and preventative steps to avoid any coronary problems from occurring too soon by regularly monitoring their blood pressure. This paper will also take a look at the barriers that may prevent this population from being compliant with this intervention. The procedure includes dispensing home blood pressure monitors to 15 women. After 6 weeks, these women will be contacted to inform me of their values over this time, and there will be inquiries done to assess any barriers that were in place. I would hope that younger women, particularly of childbearing ages, would attempt and complete these steps after recognizing the prevalence and increasingly earlier onset of hypertension in African Americans. Women, in general, have been known to take greater strides to better healthcare. Hopefully, by completing this feasibility study, we can begin to see what may hinder young African American women from being more aware of their blood pressure. *Summer Health Professionals Program*

023 Quantifying Real-World Activity and Upper-Limb Use in Children with Cerebral Palsy Using Accelerometers

Quantifying Real-World Activity and Upper-Limb Use in Children with Cerebral Palsy Using Accelerometers, Jacqueline Connolly[1], Daniel Shelton[1], Reagin Hoover[1], Na Jin Seo[1], Ryan Downey[2], Patty Coker-Bolt[1]; *[1]Occupational Therapy, MUSC, [2]Health Sciences and Research, MUSC*.

Constraint-induced movement therapy (CIMT) is a high-dosage rehabilitation approach used for children with hemiplegic cerebral palsy (CP). Questions remain regarding how much movement is required during CIMT programs to change the functional abilities of children with CP. Understanding optimal therapy dosage and intensity is important for maximizing outcomes, accurately costing services, and offering family-friendly, achievable interventions. Accelerometer data could further elucidate the relationship between high-intensity CIMT and changes in patterns of upper arm use. The goal of this study was to quantify the real-world activity and upper-limb (UL) use of children with CP who participated in a CIMT program. The aims were to 1) determine the feasibility of using accelerometers to quantify UL movements in children with CP, 2) compare activity level of children with hemiplegic CP with typical peers, and 3) determine the relationship between change in activity level and change in performance on standardized assessments. A pre-test post-test design was used with 12 children with CP (mean=4.9yrs) who completed a 30-hour camp-based CIMT program. Three developmental assessments were administered pre-post CIMT program. Accelerometers were successfully worn before, during, and directly after program to collect UL and activity data. Participants demonstrated lower levels of moderate-to-vigorous activity compared to typical peers ($p<0.05$). Significant improvements were seen on all three developmental assessments ($p<0.05$), while no significant change was observed in UL activity level as measured by accelerometers. While improvements were seen in developmental assessment scores measuring capacity and quality of affected UL in age appropriate tasks, the accelerometer data suggests that some children may not have incorporated new movements into daily habits as measured within a week post-CIMT. Follow-up testing is planned 4-months post-CIMT, after children participate in home activities prescribed in a "transfer package", to investigate if gains seen in affected UL were incorporated into everyday activities long-term.

024 Piece It Together: Exercise and Wellness Program for Young Adults with Autism Spectrum Disorders and Mild Developmental Disorders

Piece It Together: Exercise and Wellness Program for Young Adults with Autism Spectrum Disorders and Mild Developmental Disorders, Katherine E Harris[1], Carrie Papa[2], Janis M Newton[3], Keely Flynn[3], Kathleen Blaylock[3], Tyler Hunter[4], Becca Cook[3], Eve Spratt[2]; *[1]College of Medicine, MUSC, [2]Developmental Pediatrics, MUSC, [3]Wellness Center, MUSC, [4]MUSC*.

Introduction: Autism Spectrum Disorder is an increasingly prevalent disorder (1 in 68) (CDC 2014). All youth with mild cognitive disabilities are at increased risk of poor health and obesity due to restricted diets, sensory deficits, limited interests, sedentary lifestyles, and medications used to treat their disorders (Yazdani 2013, Scahill 2009). The Piece It Together Program was developed to provide socialization and wellness goals for teens and young adults with Autism Spectrum Disorder (ASD) and other mild neurocognitive deficits. The curriculum includes strength and endurance training, nutrition education, socialization and stress reduction to promote healthy lifestyle choices. Methods: Seven males and five females, aged 15-27, attended 90 minute sessions at the MUSC Wellness Center twice a week for six weeks. As each individual had unique strengths and weaknesses, each established individualized nutrition, fitness, and socialization goals. Fit Bit devices were distributed to all participants. Assessments were done at the first and last sessions, including InBody Assessments, Flourish and Fitness Scale, PHQ-9 questionnaire, and lifestyle questionnaires as well as a self-satisfaction scale. Results: Although there was resistance to participate in some activities (i.e. dance, yoga, running), all did participate and some group members loved these activities. A Facebook account was set up by two group members. Several new friendships were made. PHQ-9 questionnaire scores decreased from an average of 7.67 to 3.42. Of the eleven participants with InBody Asssessments, ten showed increases in skeletal muscle mass and seven showed decreases in visceral body fat. Statistical significance was not found due to the small group sixe and short duration of the study. Conclusion: All twelve participants expressed interest in continuing classes at the Wellness Center. The Piece It Together program was successfully able to bring this unique group together to build friendships and make healthier lifestyle choices. *SC DD Council Grant #05-21-0005. NIH/NCATS UL1TR000062*

025 A Characterization of Perinatal Cigarette Smokers Delivering At MUSC Through Inpatient Cessation Counseling and Interactive Voice Response Follow-Up

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Smoking during the perinatal period is associated with significant and costly morbidity and mortality for both mother and infant, including higher rates of pregnancy complications, preterm delivery, low birth weight, respiratory problems, and cancer. Despite efforts to provide effective targeted cessation interventions, a large portion of women continue to smoke during this sensitive period. This study aims to characterize the demographic and smoking characteristics of perinatal smokers in order to inform efforts to reduce its prevalence among this population. Smokers were identified at Labor and Delivery between June 2014 and January 2015 (n=86), and, if accessible for outpatient follow-up, registered for MUSC-Quits (n=60). An interactive voice response (IVR) service placed calls at days 3, 14, and 30 after discharge to follow-up on smoking status and offer cessation support. Additionally, 21 of these women met with an inpatient cessation counselor. The bedside consult included an interview about tobacco use and counseling with a tobacco treatment specialist. Consult records characterized the population as everyday, long-term smokers with a mean age (SD) of 27.4 (±4.4). Eighty-six percent lived with smokers and most reported high intention to quit but low confidence in maintaining abstinence. Additionally, 48% expressed interest in receiving text message support. However, only 33% of women enrolled in MUSC-Quits were successfully contacted by IVR follow-up (n=20). Everyday smokers represented the majority (n=33), yet were significantly less likely to be reached by IVR (p=0.012) than lighter smokers. Preliminary results imply that this population may benefit from MUSC-Quits, but that additional factors should be considered in order to increase the program's utilization. Further research should explore and address the particular barriers and facilitators to their use of cessation interventions in order to improve their efficacy, as such services could have a significant positive impact on the health outcomes of this population and their children. *NIH R25 DA020537*

026 Alcohol Approach-Avoidance Training: A Computerized Task to Reduce Adolescent Binge Drinking

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Background: Adolescents are at risk for binge drinking for many reasons including their overactive neural reward systems and underdeveloped judgement. Previous therapies to address the problem of adolescent drinking, e.g. educational programs or cognitive behavioral therapy, have shown limited effects. This study aimed to evaluate Alcohol Approach-Avoidance Training (AAT) as an inexpensive computerized task that could train binge-drinking adolescents to override their approach bias toward alcohol and learn to avoid it. Past research showed that when AAT was administered to adult alcoholic inpatients, the treatment group had thirteen percent less relapse than the control group a year after treatment (Wiers et al., 2011). Methods: For this pilot study, participants (N=11) between the ages of 18 and 21 (55% male) who reported frequent binge drinking (>2times/week) were recruited in the Charleston area. Participants were randomly assigned to the sham (n=5) or AAT (n=6) group. In this double-blind randomized controlled trial, participants completed six 15-minute sessions of sham or AAT within three weeks. The Timeline Follow Back was used to quantify how much they drank 60 days prior to their first treatment session and four months after their last treatment session. Results: The sham and AAT groups did not significantly differ on age, sex, psychopathology, alcohol use disorders, or drinking behavior at baseline. All participants completed treatment and the one month follow-up interview. The follow-up rate at four months was 91 percent. There were no significant changes in drinking behavior between the sham and AAT groups over time. Conclusions: This study showed the feasibility of using AAT in adolescents. Failure to reach significance is likely due to the small sample size of this pilot study. Larger sample sizes of adolescents are warranted given the promising findings in adult studies. *K12 DA031794*

027 Blood Pressure Monitoring in Peri- and Post-Menopausal African American Women

, Margaret K Ball-Dayson, Daniel Lackland; *Neurology, MUSC*.

Hypertension is an epidemic in America, especially in the African American communities. In women alone, 1 in 3 die from hypertension related deaths; stroke or heart disease. It is especially problematic to this population due to the fact that hypertension affects these individuals at far younger ages and at increased rates to their Caucasian counterparts. Elevated blood pressures associated with hypertension lead to several comorbid conditions; including but not limited to kidney disease, myocardial infarction or heart disease, and stroke. It is proposed that home blood pressure monitoring could lead to a decrease in associated comorbidities. By increasing the patient's knowledge and awareness of his or her own average blood pressure values, it is presumed that abnormalities would raise a red flag that could possibly save a life. It is presumed that education regarding risk factors of hypertension and comorbid outcomes will encourage peri- and postmenopausal African American women to monitor their blood pressures as a part of their daily routine. It is also

presumed that increased awareness of these values will lead to long term lifestyle changes that increase survival rates and decrease hypertension related deaths in this population. The hypothesis of this study is that a significant portion of African American peri- and post-menopausal women will use home blood pressure monitoring in their daily lives. The results of this study was that 9 of 9 study participants took their blood pressures for five consecutive days with an Omron 5 series blood pressure monitor. However, the time they took their blood pressures were inconsistent. Two of the nine women also had elevated blood pressure readings. The results of this study indicate that this population would be receptive to home blood pressure monitoring. Also more attention should be devoted to specific instructions regarding the importance of measuring blood at the same time everyday. A larger study of factors associated with home blood pressure monitoring would be feasible *Summer Health Professional Program*

028 Kidney Transplant Recipients Attitudes Toward Using Mobile Health Technology for Managing and Monitoring Medication Therapy

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Mobile health technology (mHealth) may be a useful tool to assist in managing medication therapy in complex surgical patients, such as transplant recipients. The objective of this study was to survey kidney transplant recipients on smartphone ownership, use of mHealth apps, and willingness to utilize technology to facilitate medication management. The survey assessed demographics, general health, use of technology and willingness to use mHealth, and medication adherence and side effects. The survey was administered to patients in a kidney transplant clinic using an iPad. Standard descriptive and comparative statistics were utilized for data analysis. A total of 139 kidney transplant recipients participated in the survey. The results indicate that 96% (129/135) of respondents own a mobile phone, 61% (82/135) own a smartphone, 30% (40/135) had prior knowledge of mHealth and 7% (10/135) were already using an mHealth app. The majority of respondents (78%, 105/135) reported a positive attitude toward the use of mHealth for medication mangagement. Smartphone ownership has increased over the past three years (61%, 82/135 vs. 35%, 35/99; p=0.0002) and smartphone owners were more likely to strongly agree with the use of mHealth (52%, 43/82 vs. 43%, 23/53; p=0.006). Non-adherence was higher in Medicaid patients (37% vs. 21%, p=0.049), but non-adherence did not appreciably influence a patient's willingness to utilize mHealth. Mean years from transplant was higher in those that reported severe side effects (4.3±5.4 vs. 2.0±3.3, p=0.013), but severe side effects were not associated with willingness to utilize mHealth. In kidney transplantation, smartphone ownership continues to increase and respondents have a positive attitude toward the use of mHealth for improving medication management. Patients that were non-adherent or reported severe side effects were equally willing to adopt this technology, suggesting that it may be a promising tool to help improve medication-related outcomes in vulnerable populations. *Summer Health Professions Program*

029 Does Postpartum Depression Affect Infant Development?

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Abstract not available.

030 A Comprehensive View of Frequent Emergency Department Users Based on Data From a Regional HIE

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Background: A significant number of patients make frequent Emergency Department (ED). We have a unique Health Information Exchange (HIE) that includes every ED encounter in all hospital systems in our region. Using our HIE we were able to characterize all frequent ED users in our region. Methods: We constructed a database from a cohort of adult patients who had information in a regional HIE for a one year period beginning March 2012. Patients were defined as FEDUs if they had 4 or more visits during the study period. All other patients were defined as Non-FEDUs. Predictor variables included age, race, gender, payer class (Self-Pay, Medicaid, Medicare, Dual-Payer, Commercial Insurance), county of residence, and ICD-9 codes. Bivariate and multivariate analyses were performed to determine associations between predictor variables and the outcome of being a FEDU. Data were uploaded into SAS (Cary, NC) for analysis. Results: The database contained 127,672 patients of which 9.6% (12,293) were FEDUs. Logistic regression showed the following patient characteristics as significantly associated with FEDU status: Age = 35-44 years old; Race = African-American; Payer Class = Medicaid; Payer Class = Medicare; Payer Class = Dual Pay (Medicaid/Medicare); ICD-9= 780-799 (Ill-defined conditions); ICD-9=280-289 (Diseases of the blood); ICD-9=290-319 (Mental Disorders); ICD-9=680-709 (Skin and SQ Tissue); ICD-9=710-739 (MSK and CT DZ); ICD-9=460-519 (Respiratory Disease); ICD-9=520-579 (Digestive Disease). No significant differences were noted between men and women. Conclusion: Data from a comprehensive regional HIE as described here can be used to better characterize patients who are FEDUs regardless of hospital system visited. This information can be used to focus care coordination efforts and link appropriate patients to a

medical home. Future studies can be designed to learn the reasons why patients become FEDUs and interventions can be developed to address deficiencies in healthcare which result in frequent ED visits. *MUSC Student Health Professions Summer Program*

031 The Impact of Sociodemographic Factors on Perceived Stress During Pregnancy

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Background: Perceived stress during pregnancy can be altered by sociodemographic factors such as marital status, maternal age, insurance, race and employment. Objective: To determine if there are differences in perceived stress during pregnancy as a function of race/ethnicity. Methods: As part of an ongoing pregnancy vitamin D study, 250 women were enrolled at 10-14 weeks of gestation and followed prospectively. The stress survey used for the Kellogg study subjects was Sheldon Cohen's Perceived Stress Scale (PSS).One survey was completed for each trimester. The following sociodemographic information was collected: age, income, race, marital status, level of education, and employment. A power of 0.80 was determined using SAS 9.3 software. A significance level of 0.05 was obtained with an N=99 for both groups. Results: 250 women had completed the study at this time of analysis of this larger ongoing study. There were significant interactions noted between stress and marital status, insurance, and race at visit 2 (p=0.0015, 0.044, 0.0001). At visit 5, marital status (p=0.011) and race (p=0.007) remained significant while insurance did not (p=0.145). By visit 7, race was the only sociodemographic that maintained significant value over PSS (p=0.003). African American women had higher PSS scores than Caucasians and Hispanics at every visit (p=0.012, 0.025, and 0.005). In a mixed model, over time, African American women had higher stress levels compared to Hispanic and white/Caucasian women (p<0.0001). Mean stress levels did not change over time during pregnancy. There were no significant differences based upon employment or maternal age at any visit. Conclusions: African American women had higher perceived stress upon enrollment compared with Hispanic and white/Caucasian women. When compared with all other sociodemographic factors, race had the greatest correlation to perceived stress levels. These findings suggest a mechanism for health disparities and have significance for the care of pregnant women.

032 Capturing Patient's Upper Limb Gross Motor Categories Using Kinect

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Around 800,000 people yearly suffer from a stroke and have upper limb motor impairments. In rehabilitation, assessment information must be gathered for making goals, planning treatments, and tracking recovery. The Kinect is a low-cost motion-tracking device that has shown promise performing movement quantification, despite limited accuracy. For categorical assessments, such as the Mallet Classification, the Kinect could be used as a gross assessment tool. This study aims to determine the ability of the Kinect to place patients in the appropriate upper limb (UL) gross motor categories as compared to the current standard of visual observation. We compared three conditions: the typical practice of immediate visual assessment while the patient performs a prescribed movement, the gold standard of multiple persons collaboratively assessment based on videos of the patient's movement, and the Kinect-based assessment using a custom-developed computer program. The first two visual assessments were performed by two occupational therapy students. Seven stroke survivors with mild-severe UL impairments participated. Inclusion criteria were ambulation and comprehension. Exclusion criteria were visual impairments or no voluntary UL movement. Participants performed the 6 functional movements including shoulder flexion, and were given a Mallet Classification score of II, III, or IV. Immediate visual assessment (Kappa=0.70-0.75) and the Kinect (Kappa=0.61) both had good agreement with the gold standard. The Kinect performed well in the frontal plane (e.g., shoulder abduction, shoulder external rotation, hand to mouth with Kappa=0.76-1). However, the Kinect had difficulty assessing in the sagittal plane (shoulder flexion, Kappa=0.26) and movements obstructed from view (hand to back, Kappa=0.07). The results suggest that the Kinect is able to perform movement assessments and may enable home-based clinical assessments to complement Teleheath, virtual-rehabilitation games, and home-based therapy to enhance patients' access to healthcare. Such assessment may be limited to frontal plane-movements to ensure accuracy. *NIH-NICHD R24 HD065688*

033 Hop, a Linker Between Heat Shock Proteins and the Piwi-piRNA Pathway

, Joseph A Karam, Dhanjaya Nayak, Rasesh Parikh, Vamsi K Gangaraju; *Biochemistry, MUSC*.

Rationale The Piwi-piRNA pathway is the least understood, yet the most highly conserved and abundant RNAi pathway found across Eukaryotes. It functions to protect germline DNA from the myriad of effects that transposable elements have. The complete mechanism of Piwi-dependent TE silencing has yet to be elucidated. Objectives We aim to characterize the function of the interaction between heat shock proteins and the piRNA pathway. Particularly in the process of loading Piwi with the majority of the piRNAs it uses to silence transposons. Methods Classical biochemistry and molecular biology techniques will be used to explore the asymmetric association of heat shock machinery with piRNA pathway proteins. A bottom up model of the processes involved will be constructed through immunoprecipitation assays to identify how Hop, Hsp90,

and Piwi interact with other known components of the piRNA biogenesis pathway. The in vivo interface between PIWI proteins and heat shock machinery will be explored through the use of transgenic fly lines and a combination of high throughput sequencing techniques. Results Our lab has shown that in Drosophila melanogaster, there is an interaction between Hop, the Hsp90/Hsp70 Organizing Protein, and Piwi. The functionality and mechanism of this interaction has yet to be characterized, and may provide an exciting new piece to the puzzle of how the Piwi protein maintains genomic integrity. Conclusion Chaperone proteins and the piRNA pathway work together in an unknown manner to ensure that transposable elements are regulated. A novel role for heat shock proteins in the biogenesis and loading of piRNAs is explored in this study.

034 AFP and TTR Expressed Cells in Visceral Endoderm (VE) Development

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Visceral endoderm (VE) appears when embryonic stem cells have divided into different populations and form a hollow structure in the center before gastrulation. Cells within VE have distinct expression of various genes and will proceed with different fates to form organs or tissues. Before further development, two vital genes called AFP and TTR are found in VE, which, according to novel studies, have significant effect in differentiation direction. Primary studies have shown three groups of cells in VE, one expressing both AFP and TTR, while others expressing only one of these two genes. This is found by embryonic body (EB) development of a transfected cell line by overexpressing both AFP carrying green fluorescence promoter (AFP::GFP) and TTR carrying red fluorescence promoter (TTR::RFP) using mouse stem cells, during which we observed cells with either green or red fluorescence and overlapping cells with both. With multiple changes happening in later stages, we're trying to find out the difference between cells expressing AFP and cells expressing TTR in their future development at a gene expression level, and furthermore, their function and eventual destiny, which, we think, may help define differentiation of cells, understand of embryo maturation and isolation of cells of interest. In order to determine the following development, we set up two cell lines marked by AFP::GFP and TTR::RFP respectively. To get cells in VE at different stages, we make EB and grow them into certain days, which we believe are crucial for genes to turn on and off, for flow cytometry. We start with day 4, for AFP turns on at day 4 while TTR turns on at day 7 due to former studies. After that, we run microarray using RNA extracted from selected cells to show expression changes over time and compare each different stage and cell line.

035 Does µCT Diagnosis Accurately Reflect Suture Fusion Status in Craniosynostosis?

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Craniosynostosis is a congenital birth defect that occurs when the calvarial sutures fuse prematurely leading to abnormal morphology, disruption of brain growth, and associated complications. Incidence of craniosynostosis is 1 in 1800-2500 births and most cases require surgical intervention for correction and repair. In many instances, the morphology and symptomology guide the diagnosis and CT scans are only necessary as a pre-operation guide. However, some of the less obvious cases of craniosynostosis require a CT scan as a primary or confirmatory means of detecting suture fusion. Due to the finite resolution of a CT scanner, the latter case may potentially be misdiagnosed. Using a mouse model of potentiated craniosynostosis (Twist 1 +/-), a histomorphometric analysis of suture status (patency and fusion) was performed to determine if histological assessment matched µ CT diagnosis. Results suggest moderate correlation between techniques in assessment of suture status, $r2=0.642$, $p=0.002$. There was however, a significant difference in measures of patency and fusion between µCT and histology, $\chi2=8.235$, $p=0.018$. Histology diagnosed suture fusion at a higher rate than µCT. As histology cannot be performed on sutures prior to surgery, symptomology is likely still paramount to proper diagnosis. CT is supportive and useful in surgical preplanning, but may not have the resolution to identify every case and thus, is not absolute. *Summer Health Professionals Program*

036 SPARC Regulates Collagen I Composition and Cellularity in the Extracellular Matrix of Murine PDL

Christina L Covar, Emilie M Rosset, Amy D Bradshaw; *Cardiology, MUSC*.

The periodontal ligament (PDL) is a fibrous, connective tissue principally composed of blood vessels, fibroblasts and collagen, located in the oral cavity. Collagen type I fibers are the major structural element of the PDL that span the periodontal space and are responsible for anchoring the outer layer of the tooth to alveolar bone. Fibroblasts, residing in the PDL, produce collagen I by secreting procollagen, a molecule with propeptides located at the N and C termini. These termini are removed before incorporation of mature collagen fibrils into the extracellular matrix (ECM). SPARC, secreted protein acidic and rich in protein, is a collagen binding matricellular protein highly expressed in ECM of collagenous tissues. Previous studies completed in our laboratory have shown that SPARC is highly expressed during ECM remodeling and turnover. SPARC has also been shown to regulate collagen I assembly and

incorporation into the PDL, a process crucial to the overall homeostasis and repair of the PDL. When compared to other collagen-rich tissues, collagen in the PDL is known to have one of the highest turnover rates in the body. This suggests SPARC is a protein of interest for potential treatment of diseases involving collagen irregularities in the ECM, such as periodontal disease in the oral cavity. The function of the N-propeptide of collagen I is poorly understood but is hypothesized to work in concert with SPARC to aid in collagen incorporation and stabilization in the ECM. Periodontal disease is defined as inflammation of the gingiva and tissues surrounding tooth structure and is clinically characterized by the loss of connective tissue attachment in the PDL, due to loss of collagen, as well as bone loss. Treatment of periodontal disease could involve ways of restoring collagen I to re-establish PDL tooth to bone attachment. This research aims to record differences in collagen composition, cellularity and ECM changes mediated by SPARC in both young and aged murine PDL. Transgenic mice models at 4 weeks and >80 weeks were used to evaluate the effects of a lack of SPARC expression in the PDL. Immunohistochemistry and immunofluorescence with cell-specific markers for collagen degradation (prolidase), proliferation (Ki67), procollagen processing (N-propeptide), and matrix composition (fibronectin) were performed on WT, SPARC-null, Col1-exon2-deleted, and double transgenic PDL. Comparisons between SPARC-expressing and wild-type (WT) PDL of different ages were made. *Center for Oral Health Research Summer Health Professions Program*

037 Is the C2 Spinous Process Efficacious As an Intraoperative Indicator for Avoidance of the Vertebral Arteries During Posterior Cervical Arthrodesis?

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Background: Posterior cervical arthrodesis at C1/C2 involves placement of a screw in the C1 lateral mass. Dissection is technically challenging due to the close proximity of vertebral arteries. We believe it would be beneficial to have an intraoperative bony landmark to guide dissection to avoid the vertebral arteries. We predict that the C2 spinous process could serve this purpose. Methods: Patients under 16 years old who had a cervical spine CT scan were included. Two measurements were made: one of the full width of the C2 spinous process base (FW) and an angled measurement in line with the posterior arch of C2 from the midline of the bifid C2 spinous process to the most lateral aspect of the base of the spinous process where it inserts into the lamina (MW). 465 patients were included and stratified into 5 age groups (group 1: <2 years old, 2: 2-<4, 3: 4-<6, 4: 6-<8, and 5: ≥8). Results: The FW was 17.69 ± 2.43 and the MW was 11.94 ± 2.32 mm. For FW and MW, the measured values increased as the age group increased. There was a statistical difference between group 5 and all other groups in the MW (MW being smaller in younger patients) (p &le: 0.001). There was also a statistical difference ($p \leq 0.001$) between groups 1 and 4 in MW. Conclusions: Based on these measurements, it is evident that there is a linear increase in C2 FW and MW as chronological age increases. When compared to a previous study that measured the distance the vertebral arteries lies from the midline at C1, the mean MW of C2 falls within the location of the vertebral arteries. The C2 spinous process may serve as a reliable intraoperative indicator of how far laterally one can dissect while avoiding the vertebral arteries. *SHP*

038 PET-CT Findings of Perineural Tumor Spread in Head and Neck Cancer

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Background: Perineural tumor spread (PNTS) along peripheral nerve sheaths is a common mechanism of dissemination in head and neck cancer and portends a poor prognosis and higher risk of recurrence and metastasis. Although MRI is the optimal imaging modality for detecting PNTS, PET-CT may also be helpful, especially in detecting skip lesions. Methods: This study was conducted through a retrospective chart review and case reports of 4 patients. Results: All patients had a history of head and neck squamous cell carcinoma previously treated with radiation and/or resection that developed PNTS detectable on PET-CT. Conclusion: PNTS is an important complication of head and neck cancer due to its clinical implications of implying poorer prognosis and higher risk of local recurrence and metastasis. It may be identified with PET-CT often as small hypermetabolic lesions that may easily be mistaken as artifactual. Therefore, increased awareness regarding the findings of PNTS skip lesions on PET-CT is necessary so that PET-CT can be utilized to detect skip lesions of PNTS earlier and thus facilitate earlier therapeutic intervention.

039 Monte Carlo Analysis of Dalbavancin and Oritavancin: Impact of Serum Protein Binding and Dosage Regimens on Target Attainment Against Common Clinical Pathogens

Jordan M Chiasson, Roger L White; *Pharmacy, MUSC*.

Introduction: Due to increasing rates of resistant Gram-positive organisms, new lipoglycopeptides have recently been marketed for acute bacterial skin and skin structure infections (ABSSSI). Monte Carlo Analysis (MCA) of two intravenous lipoglycopeptides dalbavancin and oritavancin was performed using a range of serum protein binding (PB) values and dosing regimens against four Gram-positive organisms. Methods: From peer-reviewed literature, pharmacokinetic parameters (Vss, Cl, PB), MIC distributions (MSSA, MRSA, CoNS, S. pyogenes), and pharmacodynamic targets representing stasis and 2-logs of bacterial killing (free AUC24hr/MIC ≥ 160 and ≥ 266 (dalbavancin) and ≥ 72 and ≥90

(oritavancin) for MSSA, MRSA, CoNS /≥7.2 and ≥ 16.6 (dalbavancin) and /≥2.8 and ≥5.4 (oritavancin) for S. pyogenes) were collected. MCA was performed using CrCls from our institution and the following simulated dalbavancin regimens: 1g then 0.5g seven days later and to simulate the potential impact of a patient who fails to return for the 2nd dose, a single 1g dose was evaluated. For oritavancin, doses of 1.2g and 0.8g were evaluated. (14-day assessment period) Since the exact PB in patients is not known, various PB (93% and 97% for dalbavancin, 85% and 90% for oritavancin) were evaluated. Clinical PD targets were also evaluated. Results: For murine targets, target attainment (TA%) of >95% was seen for both the low and high AUC24hr/MIC targets for both simulations. Alterations in PB resulted in minimal differences in TA%; however, at higher MICs 1-2 fold dilutional drops were seen. Oritavancin clinical targets correlated with clinical trial results when viewed over the range of PB. Conclusions: Overall, both dalbavancin and oritavancin showed excellent target attainment and will likely be effective against the pathogens evaluated. Comparison of the two drugs was difficult due to differences in target AUC/MIC times studied. More effective clinical targets need to be assessed for future research.

040 Monte Carlo Analysis of Ceftolozane-Tazobactam and Ceftazidime-Avibactam Against Common Gram-negative Pathogens

Katelin H McGory, Roger L White; *Drug Discovery and Biomedical Sciences, MUSC*.

Introduction: Ceftolozane-tazobactam (TOL-TAZ) and Ceftazidime-avibactam (CAZ-AVI), both beta-lactam/beta-lactamase inhibitor combinations, received FDA approval in 2014. Using pharmacokinetic (PK) and pharmacodynamics (PD) targets, Monte Carlo Analysis (MCA) was performed to compare the efficacy of these antimicrobials against clinically relevant Gram-negative aerobes. Methods: From peer-reviewed literature, we obtained U.S. wild-type MIC distributions (broth microdilution), PK parameters (CrCl vs. Cl regression, Vss, and serum protein binding), and PD targets. Normal and higher Vss values were evaluated (the higher volume to simulate volumes with similar beta-lactams in patients with serious infections). Using PK parameters, the inpatient CrCl distribution at MUSC (truncated to a range of 10 ¬– 120 ml/min), and a range of body weights (60 – 90 kg), free steady-state PK profiles were generated for approved IV regimens: TOL-TAZ 1g q8h (1 hr IV infusion) and CAZ-AVI 2g q8h (2 hr IV infusion). Regimens were based on normal renal function and dose-adjusted according to package inserts. Using stasis (%fT>MIC ≥25% for TOL-TAZ, %fT>MIC ≥40% for CAZ-AVI) and 2-log bacterial killing (%fT>MIC≥40% for TOL-TAZ, %fT>MIC≥50% for CAZ-AVI) PD targets, MCA was performed against E. cloacae, E. coli, K. pneumoniae, and P. aeruginosa. Results: Ranges in Vss and body weights resulted in minimal differences in %TA, therefore average %TA was calculated. Against E. cloacae, E. coli, K. pneumoniae, and P. aeruginosa, the TOL-TAZ regimen at %fT>MIC≥25%/≥40% resulted in average %TA of 99%/98%, 100%/100%, 92%/91%, and 99%/99%, respectively. The CAZ-AVI regimen at %fT>MIC≥40%/≥50% resulted in average %TA of 100%/100% against E. cloacae, E. coli, and K. pneumoniae and %TA of 99%/98% against P. aeruginosa. Conclusions: TOL-TAZ and CAZ-AVI administered at the recommended dosage regimens are predicted to achieve excellent target attainment against E. cloacae, E. coli, K. pneumonia, and P. aeruginosa. Further analysis at lower dosage regimens would be desirable.

041 Immunosuppressive Targeted Nano-therapy Down-regulates EC Release of Pleiotrophin

Sulaiman S Alhudaithi[1], Satish N Nadig[2], Omar M Moussa[3], Carl Atkinson[1], Ann-Marie Broome[4], Suraj Dixit[4]; *[1]Microbiology & Immunology, MUSC, [2]Surgery, MUSC, [3]Pathology & Laboratory Medicine, MUSC, [4]Radiology & Radiological Sciences, MUSC*.

Abstract not available.

042 Targeted Ex-vivo Nanotherapy is Protective Against Alloimmune Destruction in Solid Organ Transplantation

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Abstract not available.

043 Gap and Tight Junction Stabilization in Cardiac Transplantation

Ryan M Finnegan[1], Peng Zhu[1], Satish Nadig[2], Carl Atkinson[1]; *[1]Microbiology and Immunology, MUSC, [2]Surgery, MUSC*.

Abstract not available.

044 Complement Peptide C3a Induces Non-lytic Release of ATP From Candida Glabrata Leading to Cell Death

Jessica Dinh[1], Silvia Vaena de Avalos[2], Caroline Westwater[2]; *[1]Microbiology and Immunology, MUSC, [2]Oral Health Sciences, MUSC*.

Abstract not available.

045 The AlphaCT-1 Peptide Promotes Retinal Pigment Epithelium Cell Integrity in Models of Age Related Macular Degeneration, Elisabeth Obert[1], Christina Grek[2], Gautam Ghatnekar[2], Baerbel Rohrer[1]; [1]*Neurosciences, MUSC,* [2]*FirstString Therapeutics*.

Purpose: A critical target tissue in age-related macular degeneration (AMD) is the retinal pigment epithelium (RPE), which together with Bruch's membrane forms the outer blood-retina barrier (BRB). RPE-barrier dysfunction in AMD might result from attenuation and disruption of intercellular tight junctions. Zonula occludens-1 (ZO-1) is a major structural protein of intercellular junctions. A connexin-based peptide mimetic, aphaCT1 (Alpha Connexin carboxy-Terminal 1), was developed which competitively inhibits ZO-1 interaction with its binding partners and stabilizes gap- and tight-junctions. We hypothesized that targeting ZO-1 signaling using alphaCT1 would maintain BRB integrity and reduce RPE pathophysiology. Methods: Choroidal neovascularization (CNV) was induced using laser-photocoagulation; RPE-cell barrier loss was triggered by bright light exposure. Both models lead to VEGF-dependent cell damage. αCT1 was delivered via eyedrops. CNV size and fluid leakage were determined using optical coherence tomography. RPE flatmounts were stained for ZO-1 and occludin, and tiling patterns analyzed (CellProfiler). ARPE-19 monolayers were used to evaluate alphaCT1's mechanism of action in response to VEGF exposure. Results: alphaCT1 treatment reduced CNV development and fluid leakage, and damage was correlated with disruption in cellular integrity of the surrounding RPE cells. Light-damage significantly disrupted RPE cell morphology, which was prevented by alphaCT1 pre-treatment. In vitro experiments using ARPE-19 cell monolayers suggest that alphaCT1 stabilizes intercellular tight junctions. Conclusions: Taken together, stabilization of cellular junctions with alphaCT1 was effective in ameliorating RPE dysfunction in AMD models of photo-coagulation-induced CNV and bright-light exposure RPE-cell barrier loss. Future research will include additional investigation into the peptide's mechanism of action. *FirstString Research, Inc.; NSF IIP-1215149; NIH C06 RR015455*

046 Localization of Scleraxis in Keloid Disease, La'Toya I James, Andrea Nillas, Titus Reaves; *Regenerative Medicine and Cell Biology, MUSC*.

Scleraxis is a transcription factor in the basic helix-loop-helix family that regulates the development of human embryonic cells into specialized tissues and was originally determined to be involved in tendon formation. More recent studies have shown that scleraxis displays a more diverse presence in both normal and diseased tissues. In particular, scleraxis has been implicated in keloid disease (KD). The cell type most responsible for the dysregulation associated with KD is the fibroblasts. Fibroblasts are mesenchymal cells that play an essential role in tissue development and repair. In the skin, there are two types of fibroblasts—papillary and reticular. While not completely known, it is believed that reticular fibroblasts display a hyper-proliferative phenotype and become the keloid fibroblasts. Aside from this information, very little is known of how scleraxis contributes to keloid disease. Therefore, we investigated the localization of scleraxis in the skin and how it may lead to KD. Immunohistochemistry shows that within keloid skin, scleraxis is localized to the area normally occupied by melanocytes and reticular fibroblasts. Western blots indicate that scleraxis is present within keloid fibroblasts and immunofluorescence experiments show that scleraxis is evenly distributed within the keloid fibroblast. Interestingly, while most literature indicates that normal dermal fibroblast do not express scleraxis, cultured dermal fibroblasts and western blots performed with detergent lysates have shown that scleraxis is present in dermal fibroblasts. In addition, scratch assays show that scleraxis may play a role in migration of fibroblasts. Specifically, the N-terminal region of a scleraxis peptide was added to cultures of fibroblasts and compared to control, yielding closures of the scratch that were 50% slower when scleraxis peptide was added. Additional results reveal that scleraxis may be a secreted protein. Taken together, these results suggest that scleraxis is present in both normal dermal and keloid fibroblasts and may play a role in the activation of such fibroblasts.

047 Comparison of Bleeding and Continuation of the Contraceptive Implant in Obese Versus Normal Weight Women, Andrea M Peterson, Amy Brown, Ashlyn H Savage, Angela R Dempsey; *Obstetrics and Gynecology, MUSC*.

Background: Pharmacokinetic data suggests that serum etonogestrel levels are inversely proportional to patient weight. The clinical trials evaluating the efficacy of the etonogestrel contraceptive implant excluded women in excess of 130% of ideal bodyweight. Little is known about how experiences may differ in obese versus normal weight contraceptive implant users. Methods: We conducted a retrospective chart review that included women who received the etonogestrel contraceptive implant in our center between the years of 2006-2012. We used a structured abstract form for each participant and included an additional year of follow-up data extending through May of 2013. Outcomes of interest include proportion with early discontinuation, reasons for discontinuation, average duration of use, average weight change during use, proportion with difficult removal, reported pregnancies, and reported side effects. SAS 9.2 will be used to calculate frequencies and to perform bivariate analyses. Results: A total of 544 charts were abstracted. In our analysis, 141 patients (26%) discontinued the implant early. The most common reason for discontinuation was dissatisfaction with bleeding (12%). There were a total of 3 documented pregnancies, 2 occurring prior to implant insertion.

Additional analyses are ongoing. Conclusions: Conclusions are pending results.

048 Role of Programmed Cell Death in Complement Peptide Mediated Killing of Candida Species

, Katelyn Schneider[1], Silvia Vaena de Avalos[2], Caroline Westwater[2]; *[1]Dental Medicine, MUSC, [2]Oral Health Sciences, MUSC*.

Abstract not available.

049 Molecular Diffusion of Glucose and Lactate in Porcine Temporomandibular Joint Disc

, Michael Brown[1], Hai Yao[2], Yongren Wu[3], Nicholas Wegner[1]; *[1]Dental Medicine, MUSC, [2]Bioengineering, Clemson-MUSC, [3]Orthopaedics, MUSC*.

Abstract not available.

050 Bioprinted Matrices in an Effort to Augment Bone Healing Defects

, Adam C Jenkins[1], Samuel Herberg[2], R Nicole Howie[3], Emily Durham[3], Laurel Black[3], Mohammed Elsalanty[4], William D Hill[5], James J Cray[3]; *[1]Dental Medicine, MUSC, [2]Bioengineering, Case Western Reserve University, [3]MUSC, [4]Oral Biology, Georgia Regents University, [5]Cellular Biology and Anatomy*.

Healing of craniofacial defects due to injury or iatrogenic causes pose a great challenge to dentistry and medicine. For the past few decades, bone morphogenetic protein-2 (BMP-2) therapies using soak-loaded matrices have shown to provide great promise for the regeneration of bony tissue. However, this therapy is not without adverse side effects purportedly due to high delivered concentrations and poor local retention. Our understanding is further complicated by lack of knowledge of how exactly bone healing is augmented. We tested the hypothesis that the use of a BMP-2 bioprinted matrix would produce more robust healing through direct deposition of bony matrix, as opposed to through a cartilaginous intermediate observed in traditional delivery systems (soak load). We utilized the 5mm murine calvarial critical size defects treated with BMP-2 bioprinted matrices. We assessed bone regeneration through uCT, x-ray and bone histomorphometry after 2 and 4 weeks of healing. Results demonstrated that printed matrices regenerated bone through a cartilaginous intermediate, similar to the soak-loaded models. Additionally, bioprinting allowed for a reduction in the delivered dose of BMP-2 compared to the soak load with similar clinical results. We posit these results are likely due to better retention of growth factor on the printed matrices and not due to the mechanism of bone healing. Future research will address question of inflammation, vascularization, and bone biomechanical quality between these preclinical BMP-2 delivery systems. *MUSC SHP Program*

051 Peptide-mediated Delivery of SiRNAs to Oral Cancer Cells In Vivo and Generation of GPMVs for Translocation Studies

, Laurence P Eggart[1], Angela Alexander-Bryant[2], Andrew Jakymiw[1]; *[1]Oral Health Sciences, MUSC, [2]Bioengineering, Clemson-MUSC*.

Since the discovery that exogenous small interfering RNAs (siRNA) can be used to silence expression of disease causing genes, siRNA delivery has been explored as a new therapeutic strategy for cancer treatment. Although research has led to improved designs of siRNA delivery systems, two persisting hurdles continue to prevent clinical translation of RNA interference (RNAi) therapeutics: lack of cell/tissue-type specificity and endosomal entrapment. To overcome these barriers, we previously designed a dual peptide strategy that comprised the GE11R9 peptide that functioned to target EGFR-overexpressing cells and the 599 peptide that enabled endosomal escape. In vitro studies demonstrated that the dual peptide mediated specific delivery of siRNAs targeting the CIP2A oncogene (siCIP2A) into EGFR-overexpressing oral cancer cells, resulting in significant CIP2A gene silencing. Our intention, thus, was to further investigate the ability of the dual peptide to mediate targeted delivery of siRNAs after systemic administration using a xenograft oral cancer mouse model. In vivo imaging demonstrated successful delivery and accumulation of siRNAs into tumor tissue 48 hours-post tail vein injection of the dual peptide-siRNA complex. Furthermore, in order to elucidate energy-independent mechanisms for cellular uptake; we also explored the ability of the 599 peptide to mediate the translocation of siRNAs into giant plasma membrane vesicles (GPMVs), which lack energy-driven internalization processes. Previous literature has outlined the process of forming GPMVs; however, this process has not been optimized for oral squamous cell carcinoma (OSCC) cells lines. Therefore, we also examined the ability to form GPMVs from an OSCC cell lines. Our results demonstrated successful collection of GPMVs from CAL 27 cells by using a PFA/DTT treatment over the course of 2 hours. Further studies are currently underway to investigate the ability of the 599 peptide to mediate the translocation of fluorescently-labeled siRNAs into GPMVs using energy-independent mechanisms. *NIGMS P30 GM103331; NIDCR T32 DE017551*

052 Effect of a Home-based Intervention By Trained Community Health Nurses on Immunization Rates, Exclusive Breastfeeding, Growth Parameters, and Hospitalizations for Respiratory and Diarrheal Illness

, Vasanthan Kuppuswamy[1], Sarah Logan[2], Janani Sridhar[2], Elizabeth O'Brien[3], Deepa Ranganathan[4], Kalpana Manthiram[5], Andrea Summer[3]; *[1]College of Medicine, MUSC, [2]MUSC, [3]Pediatrics, MUSC, [4]Pediatrician, [5]National Institute of Health*.

BACKGROUND: Healthy Children Brighter Futures (HCBF) is a pilot program in Krishnagiri District, India that provides home health visits to infants <12 months of age. Community Health Nurses (CHNs) make monthly visits to the homes of these infants to assess breastfeeding, immunization status, growth, developmental milestones, and to provide anticipatory guidance. CHNs also identify acute health care needs and refer to tertiary care as appropriate. OBJECTIVE: We assessed the efficacy of this program based on four outcomes through the first two months of life – rates of exclusive breast feeding (EBF), immunization uptake of government-provided vaccines, incidence of hospital admissions and physician visits, and growth parameters including length and weight. METHODS: This pilot study was conducted as a randomized controlled trial. Three panchayats were randomized to a 'control' group and three were randomized to an 'intervention' group. Each group had 25 mother-infant dyads. The 'intervention' group received visits at one week, one month, and two months of life and nurses provided counseling services. The 'control' group received a baseline visit at one week and a final visit at two months and received no counseling services. RESULTS: Rates of EBF were 100% in both groups throughout the course of the study. No differences were found in rates of CIC (complete immunization coverage) at baseline or at the follow up visits. One hospitalization occurred over the study period (in the control group) documented during the baseline visit. Higher rates of physician visits were found in the control group compared to intervention group at both baseline (13% vs. 0 p=.48) and study endpoint (33% vs 0, p=.04). Lastly, although rates did not differ across groups in any anthropometric measure at baseline or study endpoint using the 5th percentile as a threshold, more infants in both groups measured in the normal range at follow up compared to baseline. CONCLUSIONS: Despite the small sample size and short duration of the study, additional CHN visits and counseling showed benefits. Important findings were that lower rates of physician visits were observed in the intervention group compared to the control group. While the intervention group, at baseline, had more underweight infants compared to the control group, at the two-month follow-up visit, both groups had similar rates of underweight infants.

053 Development of an Elastic Force-field to Influence Mediolateral Foot Placement During Walking

, Elizabeth Nyberg, Jordan Broadway, Jesse Dean; *Physical Therapy, MUSC*.

Mediolateral foot placement is an important contributor to bipedal gait stability. Healthy controls use a consistent strategy of actively controlling foot placement that may be disrupted amongst certain clinical populations, such as stroke survivors. However, controlled investigation of mediolateral foot placement is difficult to perform without interfering with other aspects of gait. Therefore, our goal was to develop a simple force-field able to influence mediolateral foot placement without altering the anteroposterior progression required for normal walking. The force-field we developed utilizes inextensible wires that run through leg cuffs strapped laterally to the legs of the participants. The wires are attached to extension springs that allow for a certain degree of elasticity, and the springs are attached to linear actuators that allow for controlled changes of the width between wires (channel width). During treadmill walking trials, LED markers were used to track foot mediolateral displacement and displacement of the participant's center of mass (CoM). Participants completed a 5 minute warm up to accommodate to the treadmill, an initial and final 3-minute trial without the leg cuffs, and 5 randomized trials of varying force-field channel width. Step width, step length, step width variability, and step-by-step CoM location and mediolateral foot placement were quantified using the LED markers. We found that the force-field was successful in significantly affecting step width, while not altering step length. Interestingly, the data suggest that the force-field may have a greater effect on step width in the wider channels, whereas narrower channels promote more precise step width control. In the future, we plan to quantify the effects of altering the force-field characteristics, relate mediolateral gait stabilization to energetic demand, and utilize the device to enhance or train appropriate ML foot placement among clinical populations with reduced gait stability. *Dept of Veterans Affairs IK2 RX000750*

054 Investigation of Inflammatory Infiltrates By Histologic Type in MSI and MSS Colorectal Cancers

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BACKGROUND: Colorectal cancer (CRC) is the third most common cancer worldwide and is the fourth leading cause of cancer related death. It is known that CRC malignancies form as a result of the accumulation of mutations in genes that directly control both cell growth and cell death. The DNA mismatch repair system consists of a number of major proteins that interact to identify and remove both mismatches and mutations. Deficient MMR results in a mutated phenotype known as microsatellite instability (MSI). Approximately 15% of

colorectal cancers develop through the MSI pathway and 2-5% are hereditary. Current research shows that CRCs possessing MSI are associated with unique histological and clinical phenotypes. MSI tumors frequently present as poorly differentiated cancers with mucinous, signet cell, and medullary histologic types. Additionally, an increase in tumor-infiltrating lymphocytes (TILs) was a feature shown in MSI tumors compared to microsatellite stable (MSS) tumors. METHODS: Using a subset of patient data collected from the Hollings Cancer Center (HCC) Registry, we will perform a cross-sectional study to examine the clinicopathological features of both MSI and MSS CRC tumors, focusing specifically on the association between histologic type and inflammatory infiltrates. All statistical analyses will be performed using SAS version 9.4. RESULTS: Our central hypothesis is that both the number and type of infiltrates will vary based on histologic tumor type and MSI status. Investigating associations of tumor molecular features can help to provide better insight into carcinogenesis processes, a crucial component in cancer research.

055 Brain CT in Acute Traumatic Brain Injury: Are We Missing Subdural Hematomas with Axial Images Alone?

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More than 1.5 million ED visits for acute traumatic brain injury (TBI) occur each year in the United States. Noncontrast brain CT with contiguous axial slices is the current recommendation for initial TBI evaluation. However, there is no recommendation for the inclusion of coronal or sagittal reformatted images. Oftentimes, pathology develops within the transverse plane thus decreasing conspicuity with current standards. Orthogonal reconstructions have shown to increase reader diagnostic confidence and sensitivity in detection of pathology in multiple areas including appendicitis and small bowel obstruction. Patients with delayed traumatic intracerebral hemorrhage (DTICH) initially present with a negative brain CT after TBI, but go on to develop intracranial hemorrhage on subsequent scans. The majority of DTICH cases have occurred following negative CT review of axial images only, with a significant percentage comprising subdural hematomas (SDH). The purpose of this study was to determine if the addition of coronal and sagittal reformatted images to axial brain CT increase the sensitivity for detection of SDHs. A retrospective screening of consecutive brain CTs acquired for an indication of acute trauma was performed. The IRB-approved study was designed to include 200 brain CT examinations (100 SDHs and 100 negative controls). Three readers (a board-certified neuro-radiologist, a neuroradiology fellow, and a radiology resident) were blinded to the purpose of the study and asked to provide their diagnostic impressions. Each patient's scan was presented twice: once with axial images and once with axial plus orthogonal reformats. Using the final clinical report as a standard, detection rates of SDHs were compared between axial and axial plus reformat reading sessions. Study findings will warrant validation at other institutions as well as prospective assessment of its effects on patient outcomes. This could result in alteration to current TBI evaluation standards with consideration for the inclusion of coronal and sagittal images.

056 Determining the Binding Constants of the OAR Domain of PRRX1a with Cofactors Using the Biacore System

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The PRRX1a gene is a homeobox gene. Homeobox gene are developmental master control switches that bind DNA and regulate transcription of nearby genes. The PRRX1a gene encodes a protein that is critical in early cranio-facial development, specifically tooth, palate, and mandible morphogenesis. A single nucleotide change alters the 231st amino acid from alanine to proline (A231P), causing a birth defect known as Agnathia-otocephaly, the phenotype of which is a missing mandible, as well as skull and ear defects. This A231P mutation is found within the OAR domain of PRRX1a. The OAR domain is a highly conserved region of 14 amino acids always observed in the carboxyl region of 16 human proteins of which PRRX1a is one. Mutations or deletions of these OAR domains are involved in various diseases and malformations including diabetes mellitus and hyperplasia of the pancreas. PITX2 is one of the 16 proteins that contains an OAR domain. Past research in the laboratory of Brad Amendt has defined that DLX2, TBX1, and PIT1 all bind to the OAR domain of PITX2. These interactions were defined primarily by pull down assays. We hypothesize that the OAR domains of the 15 other proteins will also interact with some or all of these cofactors, albeit with modified affinity. That is why we have proposed to use a system that can not only determine if a protein interaction occurs but also determine the affinity of the interaction. By using the Biacore system one can quantify the affinity between proteins and measure the dissociation as well. In order to approach this problem we wanted to express these proteins in bacterial cells so that we could make enough for the Biacore system. The following open reading frames (ORF) were cloned into the bacterial expression plasmid pFN29A: PITX2, DLX2, PIT1, TBX1, PRRX1a, and PRRX1a minus the OAR domain. This plasmid allows for expression of each of the ORF with a Histidine tag and a HaloTag (HT). Upon induction of the plasmid protein, these histadine tagged proteins are purified using Nickel affinity columns (Talon purification columns from Promega). Once purified these proteins will be loaded into the Biacore system the and the HaloTag of the fusion protein will be used to bind to the Biacore chip for immobilization. Then the cofactors are run over the chip that has bound the fusion protein to determine if the OAR domain is bound by the cofactors to measure the association and dissociation constants using Surface

Plasmon Resonance (SPR) technology. Currently we are have cloned all the necessary plasmids andare in the process of purifying all the fusion proteins for introduction to the Biacore system. This will take us closer to a conclusion of the binding affinity of these proteins to their cofactors and a better understanding of how these proteins associate with each to facilitate normal cranio-facial development and how alterations may cause disease and malformations.

057 Association Between Routine Triple-Rule-Out Computed Tomography and Reduced Hospital Admissions, Length of Stay, Recidivism Rates, and Cost in the Emergency Department Triage of Chest Pain

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Objectives: To assess the effects on resource utilization of routine triple-rule-out computed tomography (TRO-CT) in triaging chest pain patients in the emergency department (ED). Methods: We conducted a retrospective analysis of data from two risk-matched cohorts of 761 ED patients presenting with chest pain to assess the impact of TRO-CT versus standard evaluation on admissions rate, length of stay, recidivism rates, downstream resource utilization, and associated health care cost. Results: The overall admission rate was lower with TRO-CT (11.2% vs. 56.1%, p<0.001), while duration of hospitalization was similar (53.5 hours vs. 54.5 hours, p=0.76). The usage of TRO-CT was associated with a lower rate of patients returning to the ED within 30 days (1.2% vs. 10.4%, p<0.001). Initial evaluation using TRO-CT showed a significant decrease in non-invasive downstream imaging modality utilization (8.1% vs. 36.5%, p<0.001) as well as invasive coronary angiography (0.7% vs. 12.7%, p<0.001). Average associated health care cost were lowered with initial TRO-CT ($12,473 vs. $18,235, p<0.001). Conclusions: The routine use of TRO-CT in ED evaluation of chest pain reduces healthcare resource utilization and associated cost. *SHP Grant-2 T35 DK 7431-31*

058 Does Upper Extremity Movement Efficiency Relate to Participation Post-Stroke?

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Introduction: Upper extremity (UE) movement inefficiency is a common impairment post-stroke, which can prevent smooth and direct movement, leading to an increase in energy expenditure and difficulty completing daily activities. Post-stroke, individuals also often restrict their involvement in life situations (participation). An assumption exists in rehabilitation that reducing UE impairment (e.g. movement inefficiency) will translate to increased participation, however there is mixed evidence to support this premise. This study aims to determine whether UE movement efficiency (smoothness and directness of movement) is associated with participation in high-demand (physically demanding) and low-demand (sedentary) leisure activities post-stroke. We hypothesized that UE movement efficiency would have a moderate correlation with participation in high demand leisure (HDL) activities and a low correlation with participation in low-demand leisure (LDL) activities. Methods: Analysis of existing data from a VA funded study (n=71 subjects, mean age=55.6, mean months post-stroke=28.8) was conducted using Spearman's rho correlation coefficients to determine the relationship between UE movement efficiency and participation. UE movement efficiency was measured during motion capture kinematic analysis of forward reach and grasp using two variables: peaks of velocity (PV) (smoothness) and index of curvature (IOC) (directness). Participation (percentage of HDL and LDL activities retained) was measured using the Activity Card Sort. Results: Negligible correlations were found between percentage of HDL activities retained and IOC (.06, p=.64), percentage of LDL activities retained and IOC (.11, p=.38), and percentage of LDL activities retained and PV (-.12, p=.32). A weak negative correlation was found between percentage of HDL activities retained and PV (-.25, p=.04). Conclusion: Participation post-stroke is complex. Targeting and reducing UE impairments (movement inefficiency) may not lead to an increase in participation in HDL or LDL activities. Therapists may also need to focus on additional impairments (e.g. affective, cognitive) and environmental factors (e.g. social support) to address participation restrictions. *Ralph H. Johnson VAMC, Rehabilitation Research and Development Merit Award*

059 Feasibility of a Scapular Tracking Device to Assess Post Stroke Shoulder Impairment

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Rationale: 3D kinematic analyses are a powerful tool to assess upper extremity deficits caused by stroke. Despite the scapula's 60° contribution to shoulder flexion, few motion capture systems track scapular movement. To fill this gap, a reliable scapular tracking system is needed. The purpose of this study is to validate a novel scapula tracking system by evaluating its measurement error and by testing its feasibility for assessing post stroke shoulder impairment. Methods: We evaluated the measurement error on 11 healthy participants by comparing measurements of scapula lateral rotation at 30, 60, 90, 120 and 150 degrees of humeral elevation (HE) to palpation of the scapula. We verified the tracker's ability to capture post-stroke impairments on 15 healthy participants and 14 stroke survivors reaching to a target at 110 degrees of HE. We tested for a difference between the groups at 60° HE

with a two tailed Wilcoxon rank-sum test, and verified that the difference was greater than the measurement error. Results: We found that the measurement error of the tracker was smaller than 5° up to 90° of HE. Furthermore, there was a significant difference in scapular movement between healthy participants and stroke survivors (p=0.034), with a higher average angle in stroke survivors (22.796°) than the healthy group (17.155°). This difference was significant even when taking the measurement error into account, with group means separated by more than 11 times the standard error. Conclusions: The proposed scapula tracker is a valid tool to measure scapular angles. Despite the measurement error associated with the system, it is effective in detecting post stroke shoulder impairment and can be integrated in the kinematic assessment of upper extremity motion. Due to the importance of the scapula during upper extremity movement, this study provides us with valuable information for evaluating and directing future neurorehabilitation methods. *NIH/NGMS COBRE for Stroke Recovery*

060 What is the Relationship Between Repeated Practice and Arm Motor Ability for Stroke Survivors?

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Introduction: Stroke causes upper extremity (UE) paresis. Hundreds of movement repetitions are necessary to promote neural reorganization for UE recovery. Integrating interactive computer games into stroke rehabilitation can provide the necessary repetitions and be motivating and engaging. Objective: Explore the relationship between the number of repetitions and gains in paretic UE function after an intensive stroke rehabilitation program. Methods: Analysis of existing data; 24 subjects, 20-78 years of age, 5 days-67 months post-stroke who played Duck Duck Punch (DDP), a custom Kinect-based game, 1 hour/day x 7 days. UE function was defined as gains in motor ability (Wolf Motor Function Test, WMFT) and degrees of elbow active range of motion (AROM). The strength of the relationships between repetitions and WMFT and AROM was explored with Spearman's rho and partial correlation controlling for "scaling," a game feature that matches DDP difficulty to subjects' ability. Post-hoc analyses investigated the influence of motor severity strata on the results. Results: There was a moderately strong relationship between repetitions and the WMFT (r=.570, p=.01). When stratified, the correlation reached significance in only the severely impaired strata (r=.733, p=.05). There were no statistically significant relationships between repetitions and AROM in the group (r=.040, p>0.05) or strata (r ranged from -0.200 to -0.489, p>0.05). Conclusion: This study demonstrated that the amount of movement practice in a stroke rehabilitation program was associated with gains in arm motor ability, especially with severely impaired individuals. However, there was no practice effect on elbow AROM. DDP appears to be a useful method for elicit movement practice as part of a stroke rehabilitation program. This study is an important first step towards future dose-response studies to understand the optimal number of repetitions required to elicit functional recovery and also to understand what aspects of UE function change in response to practice. *NIH/NGMS IDEA De-Accel CTR*

061 Effect of Saturated Fatty Acid Heptadecanoic Acid (C17:0) Rich Diet on the FGF21/Adiponectin/Ceramide Axis in Bottlenose Dolphins (Tursiops Truncatus)

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Bottlenose dolphins have been proposed as a novel animal model for the study of metabolic syndrome. Dolphins with metabolic syndrome exhibit elevated serum insulin, triglycerides, cholesterol, ferritin, and total iron. Dietary fatty acid levels vary in fish, and higher serum heptadecanoic acid (C17:0) is an independent predictor of lower, healthier insulin and ferritin in dolphins. A recent study in dolphins found a diet modification to one rich in C17:0 over a 24 week period led to a reduction in serum ferritin and reduction in variability of insulin and triglycerides. We propose that an increase in insulin sensitivity may have resulted in these observed corrections. The FGF21/Adiponectin/Ceramide axis has been implicated in elevating insulin sensitivity; therefore, we hypothesized that these dolphins should exhibit an increase in serum FGF21, adiponectin, and sphingosines and a decrease in serum ceramides over the study period. FGF21 levels were only detected in two dolphins and may possibly be due to low levels in dolphins. Total serum adiponectin levels increased over baseline 776±401 pmol/ml to 1196±467 pmol/ml at 24 weeks ($P<0.05$). Total ceramides did not change over the study time period; however, there was a significant decrease in the major ceramide C24:1 from baseline 1826 ± 289 pmol/ml to 1287 ± 205 pmol/ml at 24 weeks. Total sphingosines increased over the study time period from baseline 460 ±39 pmol/ml to 747 ± 107 pmol/ml at 24 weeks ($P<0.05$). Interestingly, a comparison of dolphin ceramide levels to human ceramide levels showed that dolphins have lower total ceramide levels, and unlike humans, dolphin C24:1 is the most abundant ceramide species in the serum. With the exception of FGF21, our data support the hypothesis that dietary intervention leads to an elevation in total serum adiponectin, total serum sphingosine, and a reduction in the major serum ceramide species. *Office of Naval Research*

062 Co-targeting EGFR/ROS RTK and HDAC By a Novel Agent in Glioblastoma

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Glioblastomas are the most common primary malignant brain tumors, with approximately 28,000 new cases diagnosed in the US and EU each year. A common genetic abnormality that occurs in this tumor entity is amplification of epidermal growth factor receptors (EGFRs) (with or without mutation). While inhibitors that target this class of receptors has been identified (Receptor Tyrosine Kinase Class 1), the results to date have been disappointing. Research has shown that this is primarily due to signal redundancy due to co-activation of several functionally linked receptor tyrosine kinases (RTKs) including ROS 1 (an RTK class orphan) and chromatin modification, especially histone deacetylases (HDACs) that lead to resistance to RTK inhibition. In this study, we used the novel natural agent diallyl trisulfide (DATS) in order to target EGFR/ROS 1 RTK and HDAC in our preclinical model of glioblastoma. We first evaluated the co-inhibition of EGFR/ROS 1 RTK signaling and HDAC activity by DATS in vitro using multicellular tumor spheroid and in ex vivo models. In these experiments, DATS was shown to reduce cell death, inhibit HDAC activity, and increase caspase activity specifically in tumor cells but not in normal human neurons. This suggested great efficacy and specificity of DATS. We then evaluated DATS in the context of an orthotropic glioblastoma xenograft model. Our initial findings indicated suppression of tumor growth, proliferation, and angiogenesis following DATS treatment in the EGFR expressing cells. *COM and Neurosurgery, MUSC*

063 The Impact of HIV-Centered Obstetric Care on Perinatal Transmission and Maternal Linkage to Care in HIV-Infected Women

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Objective: To determine the effects of HIV-centered obstetric care (HCC) on maternal and fetal outcomes. The primary outcome of interest was perinatal HIV transmission. Methods: This was a retrospective cohort study HIV-infected women and their HIV-exposed infants who delivered from 2000 to 2014. Prior to 2009, women received care in a high risk pregnancy clinic (HRC). In 2009, a HCC service was established, staffed by obstetrician specialists with HIV medical training, a social worker, and a patient advocate. HIV-infected women delivering after 2009 received HCC. Maternal and neonatal outcomes, including perinatal HIV transmission rates, were compared between HIV-infected women receiving HRC compared to HCC. Continuous variables were compared with Student's t-test and Wilcoxon Rank Sum Tests. Categorical variables were compared using $\chi 2$ test and Fisher's exact test. Results: 161 women delivered 217 HIV-exposed pregnancies from 2000-2014; 78 (36%) women received HCC. Three perinatal HIV transmissions (2%) occurred among women in HRC compared none in women in HCC. Women in HCC were more likely to have HIV RNA viral loads (VL) < 1,000 at delivery (12% vs 26%, p=0.02), use a long-acting reversible contraceptive (LARC) method (26% vs 2%, p < 0.0001), return for a postpartum visit (80% vs 63%, p=0.01), and had lower median VL postpartum (40 copies/mL vs 1855, p <.0001). Conclusion: Implementing an HIV-centered obstetric care model may reduce perinatal HIV transmission, improve maternal virologic control during pregnancy, increase postpartum LARC use, and improve HIV care compliance.

064 Engaging Dental Students in Ergonomics

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Research has shown that dental students do not receive adequate training on proper ergonomic techniques that they can then apply to their practice (Khan and Chew, 2013). Gay-Escoda et al. (2011) found that 79.8% of dentists reported having musculoskeletal pain in the last 6 months. The purpose of our current study is to track the effectiveness of ergonomics education on promoting proper posture and body mechanics in dental students at the Medical University of South Carolina. Ergonomics can help dentists maintain proper body mechanics while interacting with objects in their environment, reducing the amount of musculoskeletal complaints and disorders. This project developed from the initial realization that ergonomic content in the dental medicine program was less than optimal. Initially a basic self-created ergonomic evaluation, created by occupational therapy students, was utilized. It was discovered that ergonomic educational content/input was required to educate dental medicine students. The mentoring professors for this research project, Dr. Peter Bowman and Dr. Joe Vuthiganon, implemented an ergonomics lecture and simulation lab sessions for first year dental students. A pre- and post-test were added to determine knowledge of proper and improper ergonomics for dental students. During the dental students' fourth year they were assessed with video-recorded sessions using the Rapid Upper Limb Assessment (RULA), an evaluation of ergonomic risk factors. The purpose was to determine how well the students maintained proper ergonomic positioning during treatment sessions with patients. There are four groups involved in this research project. We will be reporting and comparing RULA findings from Group 2 and Group 3 via video-recorded sessions. Group 2 received the ergonomics lecture their first year. Group 3 received the ergonomics lecture and the simulation lab their first year.

065 Ocular Light Scatter, Ray-tracing Aberrometry, and Scheimpflug Densitometry As an Objective Measure of Dysfunctional Lens Syndrome

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Purpose: To evaluate the optical quality of the aging crystalline lens using double-pass imaging system, ray-tracing wavefront, and Scheimpflug technologies, and to assess visual function and quality of vision of patients with presbyopia with different degrees of lens opacity. Setting: Magill Vision Center, Storm Eye Institute, Medical University of South Carolina Design: Prospective study Methods: The study included presbyopic patients with different degrees of crystalline lens opacity (LOCSIII classification) and a control group of young patients. A double-pass wavefront (AcuTarget HD) was used to measure ocular forward light scattering, specifically the Objective Scatter Index (OSI). Ray-tracing aberrometer (iTrace) was used to analyze ocular internal aberrations and modulation transfer function (MTF) to generate the Dysfunctional Lens Index (DLI). Crystalline lens density was measured using a non-contact rotating Scheimpflug device (Pentacam). Results: A total of 166 eyes with lens opacity and 82 normal eyes were enrolled in this study. Mean DLI was 6.44 ± 2.553 in the lens opacity group and 8.22 ± 4.179 in the control group ($p<0.001$). Mean OSI in the lens opacity group was 2.88 ± 2.550 and 0.72 ± 0.354 in the control group ($p<0.001$). Mean lens density was 26.80 ± 9.851 GSU in the lens opacity group and 19.19 ± 5.657 GSU in the control group ($p<0.001$). Conclusion: Objective scatter index and dysfunctional lens index are reliable, objective measures of visual impairment and offer a novel way to quantitatively evaluate visual degradation caused by the aging lens with different degrees of crystalline lens opacification. Comments: We believe this study will assist clinicians in detecting, staging, and following progression of the aging lens including loss of accommodation (presbyopia), loss of contrast sensitivity, light scatter and changes in internal aberrations.

066 Prescription Reporting with Immediate Medication Utilization Mapping (PRIMUM) in the Pediatric Orthopaedic Population

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In recent years, there has been a substantial increase in the number of opioid prescriptions written for both adults and children, without a parallel increase in pain-related medical visits. Opioid-related fatalities among adolescents have increased dramatically, along with emergency department visits by young children due to accidental poisonings from prescription medication. The PRIMUM rule, funded by a grant from the Centers for Disease Control and Prevention, was designed to identify patients at high risk for misuse, abuse, and diversion of narcotic prescriptions (defined to include opioids and benzodiazepines). The specific goal of this presentation is to provide a descriptive analysis of narcotic prescribing in the pediatric orthopaedic trauma population at Carolinas Medical Center. A retrospective chart review was conducted on 80 pediatric orthopaedic trauma patients captured in the baseline PRIMUM data. The patients were stratified into 3 age groups, and information was extracted from the medical record regarding patient demographics, prescription specifics, injury details, and fracture fixation. Approximately half of the patients prescribed narcotics had private insurance, while 44% were on Medicaid and very few were uninsured. Older children presented with a variety of fractures and mechanisms of injury, while children in the 0-5 year age group were most susceptible to falls and experienced upper extremity fractures 78% of the time. The data showed evidence of a trend towards increasing daily dosage of prescription narcotic correlated with increased age, with significant changes in dosage at ages 6, 9, and 13. This study suggests that older children being treated for orthopaedic trauma receive higher dosages of prescription narcotics than their younger counterparts. Our next steps will be to determine if the same proportion of patients in each age group are receiving prescription narcotics versus nonnarcotic analgesics and to compare prescribing practices for orthopaedic injuries at various facility types across CHS. *Centers for Disease Control and Prevention*

067 Secondary Intraocular Lens Implantation Following Infantile Cataract Surgery: Indications, Lens Placement, and Long-term Postoperative Outcomes

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Aim: To report long-term postoperative outcomes after secondary intraocular lens (IOL) implantation following infantile cataract surgery. Methods: Study population: Infants operated for congenital cataract before seven months of age. Exclusion criteria: Acquired cataract, congenital glaucoma, ROP and PFV stretching the ciliary process, <1 year follow-up after secondary IOL implantation (for postoperative outcome). We randomly selected one eye for statistical analysis in bilaterally implanted patients. Results: n=49 (25 unilateral and 24 bilateral). Age at cataract surgery: 1.7±1.2 months; Age at IOL implantation: 4.6±1.8 years; Age at final follow up: 9.1±2.4 years; Follow-up after secondary IOL: 4.8±2.8 years. 57.1% received secondary IOL because of increasing difficulties with contact lens wear. Capsular bag fixation of the secondary IOL was achieved in 69.4% of patients. No significant relationship was found between age and site of implantation of IOL (P=0.3). 37

eyes were analyzed for postoperative outcomes. After Secondary IOL, 2.7% were diagnosed as glaucoma suspect, 10.8% received medical treatment for glaucoma, 5.4% had glaucoma surgery and 5.4% had surgery to clear the visual axis. 1 patient required IOL removal because of high myopia. Median VA at final follow-up was 20/55 for unilateral patients versus 20/40 for bilateral patients. Discussion: We reported long-term outcomes for secondary IOL implantation for patients who had cataract surgery early in infancy. Implantation was most commonly within the capsular bag and done at age 4-5 years. Conclusion: Secondary IOL in children is relatively safe procedure associated with low rates of postoperative complications. *Summer Health Professionals Program*

068 The Effect of Incline Versus Decline Walking in Chronic Stroke

, Jessica E Huschart[1], Elizabeth C Wonsetler[2], Aaron E Embry[2], Steven A Kautz[2], Mark G Bowden[3]; *[1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC, [3]Ralph H. Johnson VA Medical Center*.

Abstract not available.

069 The Effect of Altering Hip Extension on Kinetic Gait Variables

, Ellie L Miller[1], Elizabeth C Wonsetler[2], Mark G Bowden[2]; *[1]Physical Therapy, MUSC, [2]Health Sciences and Research, MUSC*.

Introduction: Kinematic and kinetic outcome measures are very tightly linked in the investigation of human walking. While altering motor output is a major goal of gait rehabilitation, little is understood regarding the effects of altering a single kinematic variable on kinetic outcomes. We designed a strategy to alter hip extension during walking on a treadmill to assess the effect on a battery of kinetic outcome measures. We hypothesized that changes in hip extension would have a strong direct relationship with changes in kinetic outcome measures. Methods: Participants walked on an instrumented split-belt treadmill with motion capture to calculate hip extension and kinetic outcomes at 5 different randomized cadences: self-selected (SS) cadence; SS ± 10%, and SS ± 20%. The treadmill speed was held constant at the individual's SS walking speed, forcing cadence changes to result in alterations to hip extension. Kinetic variables (peak propulsive ground reaction force, propulsive impulse, peak ankle power, ankle plantarflexion work, peak center of mass acceleration (COMa), COMa positive area, and COMa root mean square) were collected. Difference scores from baseline SS cadence were calculated for each variable. Pearson correlation coefficients assessed the relationship between the change in hip extension and the change in kinetic outcomes. Results: 10 healthy individuals, 3 male, mean age 31.3 years old ± 7.5 (SD), participated in this study. Hip extension was successively manipulated, varying 8.3 degrees from the SS - 20% to + 20% cadence conditions, and kinetic outcomes demonstrated similar alterations. Hip extension changes at each cadence significantly correlated with each kinetic outcome ($r=0.473$-0.856; $p \leq 0.002$). Conclusions: These results demonstrate that kinetic outcomes are highly alterable in response to kinematic changes in the gait pattern. This clinically relevant finding demonstrates the potential to improve motor output in individuals undergoing rehabilitation by simply altering gait patterns to more optimal limb positions. *Career Development Award-2 RR&D N0787-W; NIGMS P20 GM109040*

070 The Variability of Kinetic Parameters with Altered Walking Speed

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Introduction: Measuring alterations in kinetic gait variables is critical to understand the mechanistic responses to walking rehabilitation. Kinetic outcomes scale to speed, necessitating post-testing at a matched speed from pre-testing. Variability of performance, however, may be more impaired at speeds different from self-selected (SS) speeds. The purpose of this study was to examine the within subject variability of changing gait speed on kinetic variables in healthy individuals, hypothesizing that variability will be minimized at the SS speed. Methods: Participants walked on an instrumented split-belt treadmill (Bertec) at 13 different randomized speeds, ranging from 0.3 to 1.5 m/s. Participants then choose their SS speed. Kinetic variables (peak ground reaction force, propulsive impulse, peak ankle power, ankle plantarflexion work, peak center of mass acceleration (COMa), COMa positive area, and COMa root mean square (RMS)) were collected. Coefficients of variation (CoV) were calculated for each kinetic variable at SS speed and minus 0.2, 0.4, and 0.6 m/s. ANOVAs were used to assess the effect of changing speed on changes in kinetic variability. Post-hoc analyses for pairwise comparisons, were completed using Bonferroni adjustments. Results: 10 healthy volunteers (3 male), age 31.3±7.5 years, participated in this study. The main effect was significant for each kinetic variable ($P<0.001$). Post hoc analyses demonstrate differences from SS speed variability only at SS minus 0.6 m/s for all variables ($p=0.002$-0.032). Conclusions: Our results demonstrate that at speeds furthest from the SS speed, variability of kinetic parameters is significantly increased. While testing at SS speed may be indicated to assess a patient's optimal performance, for the purposes of kinetic variability, matching speeds to pre-testing may be justified unless speeds are dramatically changed. *Career Development Award-2 RR&D N0787-W; NIH P20 GM109040*

071 The Effect of Changing Speed on Kinetic Gait Variables

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Introduction: Outcome measures related to motor output and force production increase with speed of walking, making their interpretation after rehabilitation interventions problematic. The degree to which kinetic outcome measures scale with speed is currently unknown. The purpose of the study was to examine the effects of changing gait speed on kinetic variables in healthy individuals and to determine the rate of change of kinetic outcomes based on speed increases. Methods: Participants walked on an instrumented split-belt treadmill (Bertec) with motion capture (PhaseSpace) at 13 different randomized speeds, ranging from 0.3 to 1.5 m/s. Kinetic variables (peak propulsive ground reaction force (GRF), propulsive impulse, peak ankle power, ankle plantarflexion work, peak center of mass acceleration (COMa), COMa positive area, and COMa root mean square (RMS)) were collected. Linear regressions were utilized to assess the relationship between changes in walking speed and kinetic variables. Results: 10 healthy volunteers (3 male), age 31.3±7.5 years, participated in this study. Walking speed was highly correlated with each kinetic variable (r = 0.992-0.999). Greater than 97% of the variance in each kinetic variable can be accounted for by the speed of walking. Based on the linear regression models, for each .1 m/s increase in gait speed, the following changes in kinetic outcomes would be expected: peak propulsive GRF (10.6N); propulsive impulse (.58 Ns); ankle power (25.4 W); ankle work (1.77 J); peak COMa (0.121 m/s2); COMa area (0.12 m/s); and COMa RMS (0.62 m/s2). Conclusion: Our results demonstrate that kinetic variables are strongly related with gait speed and that much of the variability in kinetic variables can be accounted for by changes in gait speed. It is clinically important to know how kinetic outcomes scale to speed in order to interpret changes in these variables after therapeutic interventions. *Career Development Award-2 RR&D N0787-W; NIGMS P20 GM109040*

072 Effects of White Noise Achilles Tendon Vibration on Standing Posture

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Introduction: Proprioceptive feedback is important in controlling human movement. Stochastic resonance (SR) is a phenomenon by which low-amplitude noise increases system sensitivity; SR vibration has previously been shown to enhance proprioception during passive movement. However, it is unclear whether similar methods can enhance proprioception during functionally relevant active movement. We hypothesize that appropriate vibration amplitudes will enhance proprioception accuracy during active movement. Methods: Stimulation was applied in the form of white noise vibration (100 Hz bandwidth) using small vibrating devices attached over the bilateral Achilles tendons. 20 neurologically intact participants completed 1 of 2 experimental sessions. Session A (10 participants) used 9 vibration amplitudes set as a percentage of sensory threshold, while Session B (10 participants) used 9 vibration amplitudes set as raw rms values. For each vibration amplitude, participants performed 3 quiet standing and 3 active sway trials. During quiet standing trials, participants stood on a force plate that calculated center of pressure (CoP) location and were instructed to stand still for 30 seconds. We calculated antero-posterior CoP standard deviation and absolute velocity, measures of sway. During active sway trials, subjects stood on the force plate and swayed to a series of presented targets. We quantified the accuracy of their active sway performance. Results: Vibration did not influence quiet standing (no significant change in CoP standard deviation or velocity). Active sway accuracy was improved by appropriate vibration amplitudes in session B (30 micrometer vibration improved accuracy in 10/10 participants; p=0.001). Discussion: Quiet standing performance was not improved by SR vibration. In contrast, active sway accuracy was improved by SR vibration with a specific amplitude. We postulate this is because humans rely more on plantarflexor proprioception during active movement than when simply standing still. These results could have clinical implications for populations with reduced proprioceptive accuracy (e.g. stroke, diabetes). *Dept of Veterans Affairs IK2 RX000750*

073 Higher Step Counts Are Correlated with Better Functioning and Quality of Life in Advanced-Stage Lung Cancer

, Mary C Brooks[1], Brett Bade[2], David Thomas[2], JoAnn Scott[2], Sloan Nietert[2], Ansley Ulmer[2], Paul Nietert[3], Gerard Silvestri[2]; *[1]College of Medicine, MUSC, [2]Pulmonary and Critical Care, MUSC, [3]Public Health Sciences, MUSC*.

Introduction: The objective of this study was to determine whether any correlations exist between physical activity (measured by average daily step counts) and quality of life (QoL) in advanced stage lung cancer patients. Methods: Stage III-IV non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC) patients were asked to wear a Fitbit® Zip™ pedometer for seven days. Enrolled subjects completed the Modified Medical Research Council Dyspnea Scale (MMRC), Patient Health Questionnaire (PHQ-9) and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30 version 3) at baseline. Spearman rank correlations were calculated between average daily step counts and questionnaire domain scores, with clinically meaningful positive and negative correlations defined as >0.3 or <-0.3, respectively. Results: 54 patients were approached, and 40 agreed to participate. Eleven subjects were removed from analysis due to noncompliance (n=6), technical difficulties with the pedometer (n=3) or a

cancer diagnosis other than advanced stage lung cancer (n=2). 29 subjects were included in the final analysis. Most (65.5%) subjects were male, and the mean age was 65 years (range 51-80 years). Average daily step counts were correlated with higher levels of physical, role and emotional functioning as well as overall QoL. Average step counts were also correlated with lower levels of dyspnea and depression. Conclusion: Patients with higher step counts experience higher levels of functioning and QoL as well as lower levels of dyspnea and depression. These results warrant further exploration into exercise as a therapy for advanced-stage lung cancer. *Summer Health Professions Program*

074 Mobile Vs. Stationary Mammography: Examining Patient Characteristics and Behaviors

Elizabeth G Stanley, Madelene C Lewis; *Radiology, MUSC*.

Breast cancer is the second leading cause of cancer death among women in the United States. Mobile mammography units have been used to address patient health disparities; however, there is limited data comparing these programs to ones at stationary sites. This study aims to evaluate the characteristics of women who utilize mobile mammography screening programs versus stationary facilities. In this IRB-approved retrospective study of 3,305 screening mammograms, 1,872 mammograms performed in 2014 at the Medical University of South Carolina's Hollings Cancer Center (HCC) were analyzed against 1,433 mammograms performed on its mobile unit. BI-RADS, follow-up adherence, and socio-demographic variables were recorded. Significant associations were found between race, marital status, adherence to guidelines, and recall rate. Patients visiting HCC were significantly older, while the mobile unit exhibited more racial and marital diversity: white (HCC = 51.0%, mobile = 33.3%), black (HCC = 46.3%, mobile = 54.2%), and Hispanic (HCC = 0.6%, mobile = 6.8%) patients; married (HCC = 49.9%, mobile = 38.3%), single (HCC = 24.6%, mobile = 34.5%), and widowed (HCC = 8.6%, mobile = 4.5%) patients. Stationary site patients were more often adherent (HCC = 59.7%, mobile = 34.5%) with a lower recall rate of 10.1% (vs. mobile = 16%). In addition, of those patients with a BI-RADS 0 (additional imaging needed), patients utilizing the mobile unit appeared less likely to return (HCC = 5.3%, mobile = 17.0%). Significant differences were found amongst patients at stationary facilities versus mobile mammography sites. The stationary unit's population is older and more adherent to screening guidelines, while mobile mammography patients have a higher recall rate with a lack of adherence. The mobile unit also demonstrated a greater racial and marital diversity. By identifying these characteristics, specific educational programs and targeted interventions should be developed to increase mammography screening rates among underserved populations. *NIDDK T35 Summer Health Professions Program, 2 T35 DK 7431-31*

075 Quantitative Evaluation of Left Ventricular Myocardial Contractility Using a Prototype Software Application

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The measurement of myocardial contractility is of critical importance for the diagnosis and management of patients with cardiac diseases. Myocardial contractility can be quantitatively assessed by speckle tracking echocardiography and tagging or recently developed cine-based feature tracking cardiovascular magnetic resonance (CMR). The aim of this retrospective study was to assess myocardial strain parameters in patients with hypertrophic cardiomyopathy (HCM, n=18) and isolated left ventricular non-compaction (ILVNC, n=13) using a prototype feature tracking-based software application and compare the results to normal subjects (n=18). ECG-gated cine CMR images were analyzed using a prototype application integrated in CMR42 cardiovascular imaging software tool. Endo- and epicardial contours were manually traced in short- and long-axis views and radial, circumferential, and longitudinal strain parameters were calculated patient-based and segment-based according to the 17-segment heart model. In HCM patients all of the strain parameters were reduced in the hypertrophied segments compared to the normal segments, and overall patient-based strain values were significantly lower compared to the control group. This observation is in agreement with previous echocardiographic and CMR studies. In ILVNC patients, segments affected by noncompaction showed significantly reduced strain rates compared to normal segments, the overall patient-based analysis, however, only revealed difference in longitudinal strain parameters when compared to the control group. Latter observation can be explained by previous studies indicating that longitudinal contractility may be the most vulnerable and thus affected first in the pathogenesis of the disease. This study suggests that the new prototype post-processing tool is a viable alternative to measure myocardial contractility based on previously acquired standard cine MR images. *NIH*

076 Use of Cardiac CT to Preoperatively Plan Mitral Valve Leipzig Loop Repair for Mitral Valve Repair

Maxwell H Stroebel[1], Joseph U Schoepf[2], Damiano Caruso[2], Carlo de Cecco[2]; *[1]College of Medicine, MUSC, [2]Cardiovascular Imaging, MUSC*.

Abstract not available.

077 Dual-source Dual-energy CT: Optimizing Performance of Routine Contrast Enhanced Chest CT for Detection of Pulmonary Embolus

Scott P Landreth, Damiano Caruso, Carlo DeCecco, James Ravenel; *MUSC*.

Abstract not available.

078 Examination of a Mouse Model with Bicuspid Aortic Valves for Ascending Aortic Wall Anomalies

Brittany L Cureton[1], Loren E Dupuis[2], Christine B Kern[2]; *[1]Medicine, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC*.

Abstract not available.

079 Bring Home Baby: Parents' Perceptions of NCU Discharge and Infant Readiness in Transitional Care

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Transitional care and patient discharge are health priorities emphasized in Healthy People 2020 and the Affordable Care Act. Health institutions' quality standards, through National Quality Forum and CMS, assess readmission rates when evaluating adequate patient discharge and transitional care. Furthermore, links between patients' perceptions of discharge procedures and readmission outcomes have been developed for both adult and pediatric populations. The purpose of this study was to determine patient perceptions of the discharge process in the neonatal population. More specifically, infant readiness, as developed by the American Academy of Pediatrics (AAP) guidelines, were examined. To explore the connection, parents who had infants admitted to the Special Care Nursery at MUSC were interviewed pre- and post-discharge. Health records of the admitted infant were reviewed, and neonatal nurses participated in a focus group, which was analyzed with NVivo software. Parents believed majority of the AAP Guidelines of the infant readiness were important for discharge, and the neonatal nurses established that growth, nutrition, and feeding encouraged a positive post-discharge experience. For the most successful transitional care, parents and nurses agree that infant readiness at discharge is essential. *NIH/NHLBI R25 HL096316*

080 Categorizing Medical Comorbidities in Autism Spectrum Disorders and Intellectual Disability

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Objective: Individuals with autism spectrum disorders (ASD) frequently present with comorbid medical conditions in addition to the core symptoms of ASD. Previous research on medical comorbidities in individuals with ASD has been limited by sample size and range of comorbidities under investigation. This study aims to expand on past research by examining rates of a variety of comorbid conditions in a large, epidemiological sample of youth with ASD in order to characterize the prevalence and types of comorbid conditions found in children with ASD and Intellectual Disability (ID). Method: Data for the present study came from SC ADDM, which is one of several sites collaborating with the CDC to conduct ASD and ID surveillance in the United States. For each of the study years, all 8-year-old children with ASD and/or ID in the study area were identified through screening and records abstraction at multiple educational and clinical sites and linked to Medicaid data to analyze ICD-9 diagnoses for 574 youth with ASD and 189 youth with ID. Results: Individuals with ASD were most commonly diagnosed with neurological (45%), respiratory (43%), psychiatric (42%), and gastrointestinal conditions (30%). Further examination of the psychiatric ICD-9 codes revealed that individuals with ASD were more likely to be diagnosed with ADHD, anxiety, behavioral, movement, and mood disorders than youth with ID. Conclusion: These results support previous findings that indicate that psychiatric, neurological, and gastrointestinal comorbidities are highly prevalent in youth with ASD. Further research is needed to examine the relationship between medical conditions in other organ systems and ASD and to compare comorbidities in youth with ASD and ID to a sample of typically developing youth. These results underscore the importance of carefully evaluating an individual with ASD in order to provide more targeted therapies. *Department of Pediatrics*

081 Providing Free Primary Care to the Chronically Ill: Impact on Emergency Department Utilization

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Introduction: Healthy Outcomes Initiative (HOI) began in October 2013 as a method of delivering coordinated care for uninsured, chronically ill patients who frequently utilized emergency department and inpatient hospital services. The aim of this study was to evaluate the impact of offering free primary care to uninsured patients on emergency department (ED) utilization at a community hospital. Methods: Eligible participants were offered primary care and case management services at a Family Medicine residency practice. Patients were divided into two groups based on enrollment in the program. Demographic variables between the two groups were assessed using chi-square for categorical variables and Student's t-test for numerical variables. Emergency department utilization was evaluated both pre- and post-intervention for both groups and compared using repeated measures ANOVA. Results: After removing patients known to be deceased, there were 218 (71.2%) patients enrolled in HOI and 88 (28.8%)

patients not enrolled. No difference was noted in pre-intervention ED visits. After enrollment in HOI, no difference was noted in the change in ED utilization (p=0.34). Conclusions: Providing access to free primary care for uninsured patients did not have a significant impact on decreasing ED utilization.

082 Improving Geriatric and End of Life Care in a Family Medicine Residency Program

, Victoria A Way, Russell Blackwelder, Danielle Metzler, Jennifer Gavin, James Steen, Vanessa Diaz; *Family Medicine, MUSC*.

Primary care providers are needed to provide appropriate end of life and geriatric care for the growing geriatric population. As the complexity of the healthcare system increases, training residents to efficiently use the resources available to enhance the care and quality of life of patients is paramount. One important aspect of care is providing appropriate patient referrals for home health and hospice services. This project evaluates knowledge and practice patterns of Trident/MUSC Family Medicine Residency Program physicians, which will be used to evaluate changes to geriatrics curriculum. Attending and resident knowledge and comfort with advance care was assessed via anonymous surveys, and practice patterns were assessed through chart reviews for patients > 65 years old seen over 12 months at the Family Medicine residency practice who received referrals for home health, palliative care or hospice. Referral data, patient diagnoses, annual number of clinic visits, hospitalizations and demographic data were abstracted. A majority of geriatric patients receiving referrals were women (77.1%)and non-Hispanic White (58.2%). The average age of the sample was 75.5 (SD 8.7) years, and received an average of 1.5 (SD 0.7) referrals. Home health was the most common referral made (67.2%). Hospice referrals were made for 17.2% of patients. About half of patients who received home health referrals required Physical or Occupational Therapy (50.0%), Skilled Nursing (54.9%) or Social Work (45.1%). More referrals were likely for patients who had more clinic visits and hospitalizations. Providers lacked knowledge regarding resources available, and were concerned about time restraints regarding advance care discussions. Most providers (87.5%) reported they had advance care discussions with less than 10% of patients. This evaluation shows there is limited knowledge regarding geriatric services available, and referral patterns could be improved. Curricular changes to the geriatric curriculum could improve provider comfort and knowledge, thereby improving geriatric care.

083 The Impact of Targeted Rapamycin Nanotherapy on Epithelial Cell Injury In Lung Transplantation

, Spenser Staub[1], Grace Bazzle[1], Surij Dixit[2], Ann-Marie Broome[2], Satish Nadig[1], Carl Atkinson[1]; *[1]Microbiology and Immunology, MUSC, [2]Center for Biomedical Imaging, MUSC*.

Abstract not available.

084 Association of Observed Community Environment and Body Mass Index Among Baltimore Public Housing Residents

, Trinh Chu[1], Meena Chatrathi[2], Jennifer Peyton[2], Kimber Gudzune[2]; *[1]MUSC, [2]Johns Hopkins University*.

The prevalence of obesity among public housing residents is estimated at 50%. Environmental hazards such as crime may increase obesity, while other factors such as greenspace and community engagement might be protective. Our objective was to 1) adapt an observational tool that assesses environmental hazards (physical disorder) to also describe community investment and social engagement, and to 2) characterize the relationship between the observed community environment and body mass index (BMI). We hypothesized that high community investment and social engagement would be associated with lower BMI. Based on a literature review and community observation, we developed questions to capture community investment and social engagement. Two observers then conducted assessments of all courts within two public housing developments in Baltimore, MD. We merged this data with that from a subsample on an ongoing cross-sectional survey of adults within these developments that measures height and weight to calculate BMI. Using unpaired t-tests, we examined the association of BMI with three environmental factors: physical disorder, community investment, and social engagement. Overall, we included 177 residents who were predominantly African-American and majority were women. Individuals living in courts with high community investment had lower BMI (30.5 kg/m2) than those in low community investment courts (33.0 kg/m2)(p=0.11). BMI did not vary by physical disorder or social engagement. In preliminary analyses, high community investment was linked with lower BMI, which may suggest that this environmental factor might have some protective effect against weight gain amongst public housing residents. *NIDDK*

085 Macrophage Apoptosis Induced By Malondialdehyde-modified LDL

, Johnathon W Elkes[1], Maria F Lopes Virella[2], Gabriel Virella[3]; *[1]College of Medicine, MUSC, [2]Charleston Research Institure, [3]Ralph H Johnson VAMC*.

Modified LDL(mLDL), specifically oxidized LDL(oxLDL) and malondialdehyde-modified LDL(MDA-LDL), are found in high concentrations in certain patient populations, such as patients with Type1 and type 2 Diabetes. OxLDL and MDA-LDL have been shown to activate macrophages and are immunogenic, leading to the production of autoantibodies. (95% of the main forms of mLDL circulate as immune complexes(IC)(45). mLDL-IC stimulate macrophages much more strongly than free mLDL causing release of growth factors, and pro-inflammatory cytokines(10,11). OxLDL-IC induce

increased cell survival(8,11,56), in contrast to the cytotoxic effects attributed to free oxLDL(61). MDA-LDL IC has been shown to increase the release of matrix metalloproteinases and to induce cell apoptosis. This could partially explain the clinical association between high levels of MDA-containing IC with acute vascular events reflecting plaque instability (67), such as myocardial infarction, within a VADT cohort of patients with type-2 diabetes(4). Our research aimed to identify the molecular mechanisms by which oxLDL-IC and MDA-LDL-IC impact macrophage cell survival and alter plaque stability. An ex-vivo model was created using human monocytes from healthy volunteers transformed in culture into macrophages. Macrophage cell cultures were treated with human oxLDL, MDA-LDL, and with oxLDL-IC and MDA-LDL-IC prepared with human reactants in concentrations chosen to mimic physiological levels. After an incubation period, cell apoptosis was compared between groups using an enzymoimmunoassay(EIA) assay for histone conjugated DNA within the cell lysate. Additional EIAs for TNF-a, MMP-9, MMP-1, TIMP-1, and IL-6 biomarkers were performed on the culture media. Preliminary data indicates that MDA-LDL-IC induce a marked increase in apoptosis, significantly higher than that induced by free mLDLs. Measurements of cytokines and metalloproteinases in the culture medium were initiated and are ongoing. Future directions will include additional experiments testing the effects of caspase-blocking agents to identify the possible MDA-IC induced pathways of apoptosis in human macrophages. *Charleston Research Institute*

086 Localization of Scleraxis in the Large Intestine

, Alyssa M Huggins[1], Andrea Nillas[2], Titus A Reaves[2]; *[1]Medicine, MUSC, [2]Regenerative Medicine, MUSC*.

Scleraxis is a transcription factor in the basic helix-loop-helix family that regulates the development of human embryonic cells into specialized tissue. Scleraxis was originally determined to be involved in tendon formation; however, recent studies have shown that it displays a more diverse presence in both normal and diseased tissues. In particular, Scleraxis was identified in the inflamed heart and implicated as potential factor in cardiac fibrosis. Fibrosis is a condition that follows an inflammatory insult; it is characterized by the release of excessive and dysregulated collagen by fibroblasts. Eventually, fibrosis can affect the function of an organ. In the current study, we examined the intestinal epithelium of the large bowel under normal and inflammatory conditions for the presence of Scleraxis. Specifically, we analyzed commercially purchased intestinal fibroblasts as well as intestinal tissue samples of patients afflicted with Inflammatory Bowel Disease (IBD): Crohn's Disease (CD) or Ulcerative Colitis (UC). Immunofluorescence experiments showed that Scleraxis was present in normal, non-diseased large bowel within the lamina propria and along the basolateral surface of the crypt epithelium. UC intestines revealed that Scleraxis was substantially up-regulated on the basolateral surface and highly up-regulated on the luminal surface of the crypt epithelium. These results suggested that, under conditions of inflammation, epithelial cells release Scleraxis, as confirmed by western blots. Scratch assays showed that Scleraxis may play a role in migration of fibroblasts. Specifically, the N-terminal region of a Scleraxis peptide was added to cultures of fibroblasts and compared to control. Closure of the scratch was 50% slower when Scleraxis peptide was added. Additional results revealed that Scleraxis may be a secreted protein because it was identified in the media of inflamed cultured intestinal fibroblasts. While these results are preliminary, they suggest that Scleraxis may be involved in the inflammatory responses of the intestinal epithelium.

087 Assessment of Blood Pressure Awareness in Young African-American Women

, Amy K Moon[1], Daniel T Lackland[2]; *[1]College of Medicine, MUSC, [2]Neurosciences, MUSC*.

African American women have a higher prevalence of hypertension with an earlier onset than Caucasian women. While all women benefit from hypertension treatment and management strategies, the gap in hypertension outcomes remain with an excess burden for African American women. To address this disparity, strategies to increase blood pressure awareness targeted at young African American women might be effective. However, there is little data regarding the specific strategies focused on young African Americans. This project includes the development of an intervention to improve blood pressure awareness among this high-risk sub-population. Specifically, young African American women will be assessed for their knowledge and awareness of their blood pressure. A pilot study determined the feasibility of assessing blood pressure awareness in this group for the development of a larger intervention study. This study represents the first to assess the blood pressure awareness of young African American women. The results could lead to the development of interventions focused on the increase of blood pressure awareness, which will lead to improved hypertension treatment and control, and high blood pressure prevention. Further, this project specifically addresses the disparities in hypertension and hypertension outcomes.

088 The Fli-1 Transcription Factor Regulates the Expression of IFN-gamma Inducible Protein 10 (IP10)

, Tomika S Caldwell[1], Danielle Brandon[1], Mara Lennard-Richards[1], Ning Lou[1], John Zhang[2]; *[1]Rheumatology and Immunology, MUSC, [2]Rheumatology and Immunology; VA Medical Center*.

The innate immune system is our primary line of defense to protect the host from infection from pathogens. Mammalian cells produce inflammatory cytokines and

chemokines in response to innate immune signals and their expression is tightly regulated. IFN-gamma Inducible Protein (IP-10), also known as CXCL10, is an inflammatory chemokine belonging to the CXC chemokine family. CXCL10 is chemotactic for many inflammatory cells including macrophages, and altered expression of CXCL10 is associated with inflammatory diseases, including lupus nephritis and other autoimmune diseases. The Fli-1 transcription factor is a member of the Ets gene family and regulates the immune response, along with other cellular processes including its role in the pathogenesis of renal injury and SLE. Previous data has shown that Fli-1 heterozygous NZM2410 mice, a murine model of lupus with decreased Fli-1, had significantly decreased infiltration of inflammatory cells including macrophages in kidney. We hypothesize that Fli-1 is a critical regulator in directly modulating the expression of CXCL10. From our preliminary data, Fli-1 protein expression in endothelial cells transfected with Fli-1 specific siRNA was significantly decreased compared to the expression of Fli-1 in cells transfected with control siRNA. Additionally, endothelial cells transfected with Fli-1 specific siRNA produced significantly lower amounts of CXCL10 compared to cells transfected to control siRNA after stimulation by Toll-like receptor (TLR) 4 ligands, lipopolysaccharide (LPS). Chromatin immunoprecipitation (ChIP) assay was performed to show that Fli-1 binds to the CXCL10 promoter. The CXCL10 gene promoter was cloned into the pGL3 expression vector to create a reporter construct. And we will perform a luciferase assay to determine if Fli-1 drives CXCL10 expression. Thus far, the results indicate that Fli-1 is a novel, critical transcription factor in regulating the expression of the inflammatory chemokine CXCL10. *NIH R01 AR056670; Ralph H. Johnson VAMC*

089 Hypertension and Type 2 Diabetes Mellitus As Co-factors for Microbleed Presence in Stroke Patients

, Maham Awan, Daniel Lackland; *Neurology, MUSC*.

Cerebral microbleeds are small hemorrhages of the brain resulting from damage over time to the cerebrovasculature. They have been implicated as markers for small vessel disease and associated with an increased risk of several disease states, including cerebrovascular events. Furthermore, because they are visible on MRI imaging modalities, they have been strongly considered as potential diagnostic and prognostic tools in preventative treatments of patients with stroke and vascular dementia. Because microbleeds have been seen as a product of diseases affecting vasculature, diseases that impact blood-brain permeability and increase endothelial dysfunction, such as type II diabetes and hypertension, may contribute to microbleed occurrence and quality. In this study, we will examine how hypertension and diabetes mellitus impacts the number, location, and size of microbleeds in patients who have recently had a stroke. Preceding this, we will first examine if hypertension and diabetes mellitus are co-factors for the presence of microbleeds in these patients. To perform this, we will be performing a retrospective chart analysis looking at 100 MRIs of patients admitted to the MUSC hospital system for stroke care. Microbleed characteristics will be read by radiologists and patient demographic and medical history data will be collected. Univariate and bivariate analysis will be performed to describe the patient population and determine if having hypertension and diabetes has an impact on one's microbleed status. This study has determined that using a retrospective chart analysis is not a feasible method of study to pursue this question, due to its limitations in accurately assessing patients' past medical history and lack of the ability to account for reoccurring strokes. This study proposes for future research to scrutinize their methodology in a way to account for these variables for more accurate conclusions to be made. *NIDDK*

090 Internet-Based Health Tracking Software As an Intervention to Improve Blood Pressure Awareness Among Young African American Men

, Jamel LF Brown, Daniel Lackland; *Neuroscience, MUSC*.

Hypertension is a major health problem in the United States. It afflicts about 32.6% of adults living in the United States; interestingly only 51.8% of people living with this condition have their disease under control. Hypertension is a large contributing factor to morbidity and mortality worldwide. It has been well documented that the prevalence of hypertension (BM 44.9%, WM 32.9%, HM 29.6%, BF 46.1%, WF 30.1%, HF 29.9%) is higher in the African American community compared to that of the other races in the United States. Studies have shown that African Americans develop hypertension earlier in life than do Whites and Hispanics. African American men have poorer rates of control of hypertension when compared to their White counterparts. It is also important to recognize the disparity in the rates of awareness, treatment and control of hypertension among younger age groups. Older individuals have higher rates of control, awareness and treatment. These factors along combined with disparities in access to care puts young African American males at an even higher risk for developing complications due to hypertension earlier in life. It will be beneficial to increase awareness of blood pressure in this high-risk population in an effort to stave off hypertension and complications later in life. This can be achieved with the utilization of at home blood pressure monitors. The unanswered clinical question is can an education intervention be developed to effectively increase blood pressure awareness among young African American men?. For this feasibility study we plan to recruit young African American men from community clinics, hospitals, primary care practices, churches and barbershops in the greater Charleston area. We will assess their willingness to participate in a future study. We will then determine their reasons for willingness to participate in the study or reasons for their unwillingness to participate.

091 Prognostic Significance of Extracapsular Spread, Perineural and Lymphovascular Invasion in Patients with HPV and Non-HPV Related Oropharyngeal Squamous Cell Carcinoma, Robert B Borucki[1], Shaun A Nguyen[2], Elizabeth Nicolli[2], Shaum Sridharan[2], Terry A Day[2], David M Neskey[2]; *[1]COM, MUSC, [2]Otolaryngology, MUSC*.

Abstract not available.

092 Trends in Psychotropic Medication Use and Caregiver Education: Identifying Mental Health Concerns of Children in Foster Care in South Carolina, Morgan S Goodyear, Elizabeth M Wallis; *Pediatrics, MUSC*.

Abstract not available.

093 Diabetes Clinical Interventions Improve Patient Outcomes, Kendall W Headden[1], Deborah Bowlby[2], Katherine Lewis[2], Remberto Paulo[2]; *[1]College of Medicine, MUSC, [2]Pediatric Endocrinology and Diabetes, MUSC*.

Background: Diabetic ketoacidosis (DKA) is an acute, life-threatening complication of diabetes. A previous study showed that in 2011, there were 33 pediatric patients with established diabetes admitted to the Medical University of South Carolina (MUSC) in DKA 52 times. There were 12 patients admitted in DKA more than once within a year. This population of patients consisted of primarily adolescents with longstanding diabetes, poor glycemic control and psychological diagnoses. In response to these findings, a variety of clinical interventions were instituted to reduce the number of DKA admissions: a Diabetes Transition Program, a Diabetes Intensive Program, and a Diabetes Care Coordinator position. Objective: The purpose of this study was to compare the DKA cohort from 2011 to 2014 to determine the impact of clinical interventions on patient outcomes. Design/Methods: An IRB-approved retrospective chart review was conducted. Data was collected on patients with established diabetes including clinical presentation at DKA admission, demographics, preceding diabetes management, glycemic control and psychological diagnoses. Results: The demographics of the DKA populations from 2011 and 2014 were similar with respect to age, gender, severity of DKA, and A1C at admission. The overall number of DKA admissions decreased from 2011 to 2014 from 52 to 34. There was a decrease of patients with recurrent admissions from 12 to 4. There was an increase in the average number of clinic visits in 12 months prior to admission in 2014 from 2.5 ± 1.69 to 3.46 ± 1.37 ($p = 0.03$). The average time interval from recent clinic appointment to DKA decreased from 5.12 months to 3.11 months. Fewer patients admitted in DKA had a psychological diagnosis in 2014. More patients with Medicaid were admitted in 2014 in DKA than in 2011. Conclusions: These findings suggest that our clinical interventions have shown improvement in patient outcomes.

094 Transcranial Direct Current Stimulation (tDCS) Enhances Mindfulness Meditation in Meditation-Naïve Individuals, Christopher W Austelle[1], Bashar W Badran[1], Nicole Smith[1], Chloe E Glusman[1], Brett Froeliger[2], Eric Garland[3], Mark S George[1], Baron Short[1]; *[1]Brain Stimulation Laboratory, MUSC, [2]Neuroscience, MUSC, [3]University of Utah*.

Background: Mindfulness meditation is a practice of meditation that instructs individuals to maintain a state of awareness and openness to their surroundings in the present moment. Mindfulness has been shown to lower anxiety, stress, and depression. Transcranial direct current stimulation (tDCS) is non-invasive brain stimulation method that has been proven to be safe and inexpensive while also having the ability to focally increase or decrease cortical activity. This study combines tDCS with mindfulness practice in order to enhance the effects of meditation alone. Methods: This study recruited healthy, meditation-naïve volunteers (n = 15, 7 female, avg. age: 28.2 y/o) in a double-blind, randomized, sham-controlled, cross-over study. Each participant attended 3 different 20-minute meditation sessions. During each session the subject listened to a 5-min guided meditation recording followed by 15 minutes of individual meditation while receiving one of three randomized 20-minute stimulation conditions per session (Sham, Active 1mA, Active 2mA). The anode was placed over the right EEG electrode position F8 (right temple) and the cathode over left supraorbital region. Two mindfulness scales, a mood visual analog scale, and a time dilation visual analog scale were administered. Results & Conclusions: Participants receiving either dose of active stimulation reported greater decreased feelings of anxiousness, sleepiness, nervousness, irritability, and grogginess as compared to sham stimulation. Participants also reported increases in the feelings of calmness, restless and feeling excited during both active stimulation sessions. This data suggests that tDCS can be used to enhance the effect of mindfulness meditation. A complete efficacy and statistical analysis will be presented at the poster. *Brain Stimulation Laboratory, MUSC*

095 Parental Stress Levels in Kinship Care Guardians, Leslie K Ruffing[1], Maggie J Wilkes[2], Madison Hyer[3], Carrie Papa[4], Sudie Back[5], Ellen Maher[1], Eve Spratt[4]; *[1]College of Medicine, MUSC, [2]Child Psychiatry, MUSC, [3]Public Health Science, MUSC, [4]Developmental Pediatrics, MUSC, [5]Psychiatry and Behavioral Science, MUSC*.

Background: In 2013, 3% of children in the United States were living with relatives or someone close to the child (kinship care) rather than biologic parents. Often these children have experienced multiple types of adversity and it is stressful for the caretakers. It is unknown if there is a relationship between the number of types of adversity and the parenting stress of kinship caregivers. The number of types of childhood adversity can be scored using the Adverse Childhood Events (ACE) questionnaire and types of parental stress can be assessed using the Parenting Stress Index (PSI) and its subdomains. This study assessed if there is an association between the total ACE Score and the PSI. Methods: Thirty-five children living in kinship care and their guardians were recruited from MUSC and local community groups. Guardians were asked to complete ACE and PSI questionnaires. A repeated measure, negative binomial regression was utilized to measure the association between the two scales. Results: Of the 35 children in this study, the majority were male (n = 21, 60.0%), African-American (n = 24, 68.6%), and under the care of their grandmother (n = 23, 65.7%). The average age of the participants was 12.4 (sd = 3.1) years of age. There was an association between total PSI and the number of types of ACE [p = 0.014]. Moreover, of the PSI subdomains, ACE scores were associated with difficult child [p = 0.014] and parent-child dysfunctional interaction [p = 0.010]. Discussion: Kinship caregivers who are caring for children that have experienced significant adversity are at increased risk for unhealthy levels of stress. *NIH R25 DA020537. NIH/NCATS UL1TR000062*

096 A Bilateral Anomaly: Vertebral Arteries Originating From Aortic Arch

, Christen E Chaconas, Michael Antonucci; *MUSC*.

Abstract: We present a rare case of a bilateral anomaly, both vertebral arteries arising as the fourth and fifth vessels from the aortic arch. This case is exceptionally unique, in that the right vertebral artery (RVA) is the fifth branch off the aortic arch, arising distal to the left vertebral artery (LVA). A 58 year old man presented to the emergency department with aphasia, the CT to evaluate a possible brain attack revealed the anatomic variation. Although this variant is exceedingly rare it should be noted prior to a surgical or interventional approach to the, chest, head and neck. The course of the RVA is unique, as it crosses from the left side of the aortic arch to ascend posterior to the esophagus. The atypical ascension of the RVA has a variety of clinical, surgical, and interventional implications physicians must be aware of when treating a patient with this type of anatomical variant.

097 Methotrexate-induced Myelopathy of the Dorsal Column Following Intrathecal Therapy of a Patient with Spinal Involvement of Burkitt Lymphoma

, Ross M Hansen[1], Mike Antonucci[1], Amy-Lee Bredlau[2], Michelle Hudspeth[2]; *[1]Radiology, MUSC, [2]Pediatrics, MUSC*.

Abstract not available.

098 Multireader Evaluation of Advanced Image-Based Virtual Monoenergetic Reconstruction of Dual-Energy CT Data At Low KeV Improves Image Quality of Liver Imaging

, Parker W Leland, Andrew Hardie, Carlo De Cocco, Damaino Caruso; *Radiology, MUSC*.

The purpose of this study was to compare the image quality of optimal window/level settings for lesion characterization for various liver lesions between dual-energy computer-tomographic (DECT) linearly-blended (mixed) 120kV images, monoenergetic reconstructions (70 mono) at 70kV, and advanced image-based virtual monoenergetic (50 mono+) reconstructions at 50kV, via multireader analysis. Twenty-nine subjects with a variety of liver lesions who underwent third-generation abdominal multiphasic DECT scans were prospectively evaluated and had dual energy and monoenergetic reconstructions prospectively for clinical evaluation. Multiple readers created ideal optimal windows for a linear blended study, a monoenergetic reconstruction study, and a third generation monoenergetic+ reconstruction study in arterial and portal phases. The signal and noise of the aorta were also measured for each phase. Mean liver window/level and signal were found to be significantly different at the 50 mono+ reconstruction. The mean signal (HU) of the aorta was significantly higher in the 50 mono+ than the mixed and 70 mono in arterial and portal phase density. In the arterial phase, the mixed window and the 70 mono window were not found to be significantly different in window and level, and the 50 mono+ window was found to be significantly different than both the mixed and 70 mono window and level. In the portal phase all window and level settings were found to be significantly different. The implementation of a single advanced image-based monoenergetic reconstruction at 50keV in liver DECT demonstrated improved objective image quality by increasing the signal, likely improving lesion conspicuity compared to routine linear blended images. The 50 mono+ reconstruction also showed a greater SNR than the 70 mono reconstruction, yielding a higher quality image. As this image reconstruction at 430/130 (W/L) can be incorporated into the scan protocol, this technique ought to be considered for routine clinical use when using monoenergetic+ reconstruction. *MUSC SHP Program*

099 A Noise-Optimized Virtual Monochromatic Reconstruction Algorithm Improves Stent Visualization and Diagnostic Accuracy for Detection of In-Stent Stenosis in Lower Extremity Run-Off CT Angiography

Andrew C Stubenrauch, U Joseph Schoepf, Stefanie Mangold, Carlo De Cocco, Ricardo Yamada, Akos Varga-Szemes, Damiano Caruso, Julian Wichmann; *Radiology, MUSC*.

Purpose: To evaluate the impact of a noise-optimized virtual monochromatic imaging algorithm (VMI+) on stent visualization and diagnostic accuracy for the detection of in-stent re-stenosis at dual-energy CT (DECT) angiography (CTA) of the lower extremity run-off. Material and Methods: We evaluated dual-energy CTA studies of the lower extremities performed on a 3rd generation dual-source CT system in 31 patients (18 female, mean age 62.0±11.0 years) with prior stent placement. Images were reconstructed with standard linear blending (F_0.5) and the VMI+ algorithm at 40-150keV in 10-keV increments. In-stent luminal diameter was measured to determine stent lumen visibility. The contrast-to-noise ratio (CNR) of vessel segments with and without stents was calculated. A five-point scale was used to determine diagnostic confidence. In the 21 patients who underwent additional invasive catheter angiography, diagnostic accuracy for the detection of significant in-stent re-stenosis (≥50% lumen narrowing) was assessed in F_0.5 and 80-keV VMI+ datasets. Results: CNR was significantly higher with VMI+ at ≤80 keV (range, 17.9±6.4 to 33.7±12.3) compared to F_0.5 images (16.9±4.8; all p<0.0463); luminal stent diameters were increased at ≥70 keV (5.41±1.8 to 5.92±1.7 vs. 5.27±1.8, all p<0.001). Diagnostic confidence was highest in the 70 and 80-keV VMI+ series compared to F_0.5 (4.90±0.48 and 4.88±0.63 vs 4.60±0.66, p=0.001 and 0.0042, respectively). Sensitivity, negative predictive value, and diagnostic accuracy for in-stent re-stenosis were higher with 80-keV VMI+ (100%, 100%, and 96.4%) compared to standard F_0.5 images (90.9%, 94.1%, and 89.3%). Conclusion: The noise-optimized VMI+ algorithm at 80-keV improves image quality, diagnostic confidence, and accuracy for stent evaluation at DE-CTA of the lower extremity run-off compared to standard image reconstruction.

100 Bilateral Transradial Approach to Alcohol Septal Ablation for Symptomatic Hypertrophic Obstructive Cardiomyopathy

Shawn Shaji[1], Barbara E Griffin[1], Alexandria Panuccio[1], John M Neathawk[2], Stewart M Benton[3], Jeremy D Rier[3], Valerian L Fernandes[3], Christopher D Nielsen[3]; *[1]College of Medicine, MUSC, [2]Internal Medicine, MUSC, [3]Heart and Vascular Center, MUSC*.

Abstract not available.

101 The Incidence and Risk Factors of Hepatocellular Cancer Recurrence Following Liver Transplantation

Edward D Colhoun[1], Carl G Forsberg[1], David Taber[2], Kenneth D Chavin[2], Prabhakar Baliga[2]; *[1]COM, MUSC, [2]Transplantation, MUSC*.

Abstract not available.

102 An Analysis of Orthotopic Liver Transplant Data Seeking to Improve 30-day and 1-year Overall Survival

Adam F Hernandez[1], Richard Slay[2], Ken Chavin[1]; *[1]Transplant Surgery, MUSC, [2]Science, Clemson*.

Abstract not available.

103 The Mechanism of Action of the Anti-fibrotic Drug MMS-350 Includes Activation of the Transcription Factor C-Ets-1

Catherine M Svetcharnik[1], Logan Mlakar[1], Peter Wipf[2], Carol Feghali-Bostwick[1]; *[1]Medicine, MUSC, [2]Chemistry, University of Pittsburgh*.

Abstract not available.

104 The Role of P97 in DNA Crosslink Repair

Halley B Rycenga, David T Long; *Biochemistry, MUSC*.

Accurate repair of DNA lesions, such as interstrand-crosslinks (ICL), is critical to prevent genomic instability and uncontrolled cell growth. Cumulatively, it is estimated that cells acquire up to one million individual DNA lesions per day. Cells that accumulate an overwhelming amount of DNA damage, or that no longer effectively repair lesions, can enter one of three possible states: (1) an irreversible state of dormancy called senescence, (2) programmed cell death, or (3) unregulated cell division, which can lead to the formation of a cancerous tumor. Resolving the mechanisms that cells employ to fix DNA lesions will yield a better understanding of cancer progression and tumor development. Specifically, we know that when a replication fork collides with an ICL, the CMG helicase (comprised of Cdc45, MCM2-7, and GINS) must be removed from chromatin in order for repair enzymes to access the lesion. Although the mechanism whereby CMG is loaded onto chromatin has been studied extensively, relatively little is known about how the helicase is unloaded. In 2014, it was shown that the CMG complex is actively unloaded at replication termination sites by the ubiquitin-selective segregase p97, also called VCP. Our lab recently demonstrated that when p97 is inhibited, both helicase unloading and ICL repair are blocked, arguing that the mechanism of unloading is conserved. Based on this data, we have

identified several important questions about how p97 regulates CMG removal during crosslink repair, how this process promotes cellular resistance to DNA crosslinks, and whether p97- mediated helicase unloading plays a role in the cellular response to other fork-stalling drugs. By pursuing these questions, we aim to provide a more comprehensive interpretation of p97's role in genome maintenance and tumor formation. *SCTR TL1 Fellowship; NIH R00 GM102325*

105 Development of Novel Penicillin Binding Protein 2 (PBP2) Inhibitors As Drug Candidates for Penicillin- and Cephalosporin-resistant Neisseria Gonorrhoeae

Jonathan M Turner[1], Patrick M Woster[2], Christopher Davies[1]; *[1]Biochemistry and Molecular Biology, MUSC, [2]Drug Discovery and Biomedical Sciences, MUSC*.

Gonorrhea is the second most common sexually transmitted infection in the United States, with nearly 350,000 cases reported in 2013 by the Centers for Disease Control. Untreated infections can lead to pelvic inflammatory disease, infertility, gonococcal arthritis, and increased risk of contracting and transmitting HIV. Strains of N. gonorrhoeae with decreased susceptibility to extended-spectrum cephalosporins (ESC) have emerged, marking this pathogen as a major public health concern. Two strains exhibiting high-level ESC resistance have now been isolated, one in Japan (H041) and one in France (F89). Cephalosporin resistance in N. gonorrhoeae is conferred by mosaic penA alleles encoding penicillin-binding protein 2 (PBP2) variants containing several amino acid changes compared to wild type. Although H041 is classified as the first multidrug-resistant strain of N. gonorrhoeae, it does retain some susceptibility to ertapenem and meropenem, suggesting that discovery of new carbapenems is a viable approach to developing anti-gonococcal agents. The aim of this study is the design and synthesis of novel carbapenem-based compounds exhibiting greater PBP2 inhibition compared to known β -lactams. The Davies lab has solved a high-resolution crystal structure of a mutant PBP2 construct in complex with meropenem, allowing for design of ligands with enhanced complementarity to the altered binding pocket. From the molecular structures of meropenem and ertapenem, a virtual library of 311 derivatives was designed employing functional group variation and isosterism. Each compound was docked to the PBP2 construct in silico to simulate the dynamics of binding. Using this data, and considering such factors as drug-like properties (ClogP, metabolism, toxicity, etc.) and tractability of synthesis, a group of lead compounds was identified. A facile synthetic route involving the reaction of thiols with p-nitrobenzyl-(4R,5S,6S)-3-(diphenyloxy)phosphoryloxy-6-[(1R)-1-hydroxyethyl]-4-methyl-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylate was developed and adapted for the production of the selected compounds. The synthesized leads will be tested against PBP2 variants with a range of cephalosporin resistances. *NIH R01 GM066861-10; TL1 TR001451*

106 Translational Regulation of ILEI Contributes to Vemurafenib Resistance in BRAF V600E/PTEN-null Melanoma Cells

Ken Noguchi, Buckley J McCall, Alec N Woosley, Bidyut Mohanty, Laura A Link, Philip H Howe; *Biochemistry and Molecular Biology, MUSC*.

Malignant melanoma has been an incurable disease until the recent development of immunotherapies and targeted kinase inhibitors. One such kinase inhibitor is vemurafenib, which targets the most common mutation in melanoma V600E BRAF. While vemurafenib is initially effective, it succumbs to rapid relapse due to many factors including mutation of PTEN, which encodes a negative regulator of AKT signaling. Because of the rapid relapse, a major question in cancer biology is to understand the mechanism of vemurafenib resistance. Herein we focus on the contribution of a novel metastasis-related cytokine Interleukin-Like Epithelial-to-Mesenchymal Transition Inducer (ILEI). Our research group has shown previously that the expression of ILEI is controlled at the translational elongation step. Under homeostatic conditions hnRNP-E1 binds and inhibits the translation of ILEI mRNA, but TGF-β treatment releases hnRNP-E1 from ILEI mRNA, and allows for active translation. We and others have observed that ILEI is necessary for several cancer-related phenotypes including epithelial-to-mesenchymal transition (EMT) and cancer stem cell (CSC) formation. In the present study we sought to discover a more specific biological context for ILEI. Through a series of serendipitous events we stumbled upon the observation that PTEN-null (PTEN-) melanoma cells have increased ILEI protein when compared to PTEN-wild type (PTEN+), but there was no difference in ILEI mRNA. This suggested that ILEI may be translationally regulated in PTEN- melanoma cells, providing a novel context for the hnRNP-E1-mediated translational regulation mechanism. Next, we wanted to know if the presence of ILEI in PTEN- cells has any functional significance. As stated previously, ILEI contributes to several cancer-related phenotypes including EMT and CSC, both of which contribute to chemoresistance. Thus, we developed the hypothesis that translational regulation of ILEI contributes to vemurafenib resistance in PTEN-null melanoma cells. In order to test this hypothesis we transduced shILEI lentivirus into PTEN- cells and used immunoblot and MTT assay to observe that ILEI knockdown attenuates vemurafenib resistance. *Abney Foundation Scholarship, NIH GM08716, CA055536, and CA154663*

107 Targeting the Protein Kinase HUNK in Triple-Negative Breast Cancer

Carly Bess Williams[1], Melissa Abt[1], Lewis Chodosh[2], Elizabeth Yeh[1]; *[1]Cell and Molecular Pharmacology & Experimental Therapeutics, MUSC, [2]Cancer Biology, University of Pennsylvania*.

Breast cancer is a disease that continues to evade intervention with many gaps still existing between its

underlying mechanisms and treatment. Triple-Negative Breast Cancer (TNBC) is a breast cancer subtype with a particularly aggressive phenotype, representing ~15% of all breast cancer cases. TNBC is characterized by the absence of the estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor-2 (HER-2), all of which are commonly used breast cancer markers. Even though TNBC lacks these three common receptors, it over-expresses EGFR in 50-75% of its cases. The overexpression of EGFR in TNBC makes EGFR an obvious therapeutic target. However, EGFR inhibitors (e.g. cetuximab, gefitinib, erlotinib) have shown to be unsuccessful in slowing metastatic disease, or increasing the overall survival of patients with TNBC. One explanation for the difficulty in impairing EGFR in breast cancer is that continued receptor recycling through endocytosis sustains EGFR activation, thereby impeding effective targeted inhibition while leading to breast cancer progression. Our lab has identified Hormonally Up-regulated Neu Associated Kinase (HUNK), a protein kinase, which we can show to maintain EGFR stability in TNBC cells. We have been able to show the absence of HUNK deregulates EGFR stability, increases phosphorylation of tyrosine residue 1045 (Y1045) on EGFR, increases c-Cbl protein levels, and prohibits tumor growth. Furthermore, we find that targeting HUNK enhances the activity of EGFR inhibitors in both in vitro and in vivo mammary tumor models. *American Cancer Society IRG-97-219-14; Concern Foundation Conquer Cancer Now; NIH R01 CA187305; SCTR*

108 The Role of TAK1 in Sinoatrial Node Differentiation

, Yunkai Dai[1], Ann Foley[2]; [1]*Bioengineering, Clemson University,* [2]*Regenerative Medicine and Cell Biology, MUSC*.

Pacemaker cells are exceedingly rare, accounting for <10,000 of the 10 billions cells of the whole heart. Damage or failure to pacemaker cells in the sinoatrial node (SAN) leads to bradyarrhythmias and eventually, heart failure. We are very interested in the regulators that direct SAN differentiation. Our preliminary data show that TAK1-overexpressing Embryonic Stem (ES) cells are more likely to differentiate into pacemaker-like cells as compared to untransduced ES cells. Besides, markers for SAN were significantly upregulated while cardiac contractile proteins are downregulated. In order to understand the underlying mechanisms by which TAK1 overexpression directs myocardial progenitor differentiation toward the cardiac pacemaker fate, we set up an ES cell line in which the expression of both TAK1 and a red fluorescent reporter are driven by a doxycycline-inducible promoter. This conditional TAK1 ES cell line also harbors a green fluorescent reporter driven by the cardiac specific promoter, Myosin Heavy Chain-alpha gene (MHCα::GFP). The goal of this research is to study the role of TAK1 during cardiac differentiation and this dox-inducible TAK1 ES cell line enables us to turn on/off the expression of TAK1 at specific times after the formation of Embryonid bodies (EB), such as d0, d6, d8, etc. TAK1 mRNA over-expression would be validated by qRT-PCR and Green & Red fluorescent would be checked each day. The fluctuation of TAK1 downstream signaling, like p38, JNK, PI3K and the acquisition of SAN fate will be measured by qRT-PCR and physiological studies.

109 Access to Quality Care for People Living with Systemic Lupus Erythematosus: Use of Ambulatory Care Sensitive Conditions As a Predictor of Access

, Elizabeth A Brown[1], Kit Simpson[2]; [1]*Health Professions, MUSC,* [2]*Healthcare Leadership and Management, MUSC*.

Background: Limited access to primary care decreases the likelihood that patients with systemic lupus erythematosus (SLE) are diagnosed and referred to specialty care increasing the risk for lupus flares and high utilization of hospital care. Objective: To investigate the association between rates of ambulatory care sensitive conditions (ACSC) hospitalizations and SLE hospitalizations across selected geographic areas. Methods: Data from the Healthcare Cost and Utilization Project (HCUP) for South Carolina (SC), North Carolina (NC), and Florida (FL) were used to identify rates of ACSC hospitalizations and SLE hospitalizations by county. Results: ACSC hospitalizations and SLE hospitalizations from 213 counties were used. The adjusted linear associations between ACSC hospitalizations and SLE hospitalizations were significant in all three states: SC ($r^2=0.37$, $p<0.001$), NC ($r^2=0.26$, $p<0.001$), and FL ($r^2=0.06$, $p=0.025$). Blacks, compared to Whites, had the highest average rate of SLE hospitalizations in all three states: SC (10.8 vs. 4.5), NC (10 vs. 3.8), and FL (11.9 vs. 6.4). The association between ACSC hospitalizations and SLE hospitalizations was the highest for Whites, compared to Blacks, in SC and NC. In NC, for the Black population, no linear association was found between ACSC hospitalizations and SLE hospitalizations ($r^2=-0.00$, $p=0.861$). However, in FL, the adjusted linear association between ACSC hospitalizations and SLE hospitalizations was highest for Blacks ($r^2=0.18$, $p<0.001$) compared to NC and SC. Conclusions: People with lupus who live in counties where there is poor access to primary care have higher risk of hospital admissions. Blacks have a higher average rate of SLE hospitalizations (almost double that of Whites), which may be due to higher SLE disease severity in Blacks. Future research should examine methods to alleviate barriers to specialist care for people with lupus, especially for those in geographic areas with high rates of preventable hospital admissions. *Southern Regional Education Board (SREB)-State Doctoral Scholars Program & Fellowship*

110 Evaluation of 3,5-diamino-1,2,4-triazoles As Epigenetic Modulators for the Treatment of Periodontal Disease (PD)

Joy E Kirkpatrick, Mark A Johnson, Patrick M Woster; *Drug Discovery and Biomedical Sciences, MUSC*.

Lysine specific demethylase 1 (LSD1) is an epigenetic eraser enzyme in the amine oxidase family that removes methyl groups from specific lysine residues on histone "tails", resulting in altered gene expression. This enzyme has been a recent target for cancer therapeutics based on its ability to promote re-expression of tumor suppressor genes.1, 2 In our laboratories, we have discovered a series of small molecules, the 3,5-diamino-1,2,4-triazoles, that act as reversible inhibitors of LSD1 and promote increases in methylation at histone 3 lysine 4 (H3K4).3 Our recent studies demonstrated that the 3,5-diamino-1,2,4-triazole known as C1 protects against ischemic reperfusion injury in mice via an epigenetic mechanism (unpublished observations). These encouraging results prompted us to target other inflammatory injuries that may benefit from epigenetic modulation via LSD1 inhibition. Periodontal disease (PD) is an oral inflammatory syndrome affecting nearly 50% of the adult population in the United States. When left untreated, PD causes alveolar bone loss and ultimately tooth loss due to an exacerbated inflammatory response. We have recently initiated studies to determine the effects of LSD1 inhibition on the development and progression of PD in an ex vivo model in RAW264.7 cells. These cells will be stimulated with lipopolysaccharide from E. coli to simulate PD. Following treatment with C1, cells will be screened for osteoclast markers and morphology after RANK-L stimulation and changes in inflammatory cytokine transcription via real time polymerase chain reaction (RT-PCR) measurement of gene expression. Our PCR data will then be validated using Western blotting. Our overall goals are to determine whether there is a link between PD pathogenesis and LSD1 activity, to develop a cell-based assay for evaluation of novel inhibitors of LSD1, and ultimately to identify a novel therapeutic intervention for PD. *NIH RO1 CA149095*

111 Validation of Theoretical Pathway Between Discrimination, Diabetes Self-Care and Glycemic Control

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This study examined the mechanisms through which discrimination influences diabetes self-care and glycemic control in patients with diabetes by using structured equation modeling. 615 patients were recruited from an academic medical center and a Veteran's medical center in the southeastern United States. Measures were based on a theoretical model and included perceived discrimination, social support, social cohesion, and perceived stress. Structured equation modeling examined the relationship with diabetes self-care and glycemic control. The final model ($chi2(211)=328.82$, $p=0.0001$, $R2 = 0.99$, $RMSEA=0.03$ and $CFI=0.98$) shows that higher stress was significantly related to decreased self-care ($r= -0.43$, $p < 0.001$) and increased HbA1c ($r= 0.14$, $p=0.048$). Increased discrimination ($r= 0.27$, $p < 0.001$), decreased social support ($r= -0.43$, $p < 0.001$), and increased social cohesion ($r= 0.11$, $p=0.01$) were significantly related to increased stress. These results support the hypothesized pathway of stress, showing both a direct and indirect influence of stress on HbA1c in adults with diabetes, with an indirect influence of discrimination through this stress pathway. Understanding the pathways through which discrimination influences diabetes outcomes is important for providing more comprehensive and effective care. These results suggest future interventions targeting patients with diabetes should take stress into account. *NIDDK K24 DK093699*

112 Mechanistic Implications of Advanced Glycation End-products to Prostate Cancer and Racial Disparity

Danzell Smith[1], Dion Foster[1], Van Phan[1], Victoria J Findlay[1], Lourdes M Nogueira[1], Judith D Salley[2], Marvella E Ford[3], David P Turner[1]; *[1]Pathology, MUSC, [2]Bio. and Phys. Sci., SCSU, [3]Public Health Science, MUSC*.

Poor diet, low income, obesity and a lack of exercise are established lifestyle factors that are known to increase cancer burden and are often more prevalent in African American communities. As our understanding of tumor biology advances it is becoming clear that these factors have distinct molecular consequences on the biological make-up of tumors, altering cell signaling events and gene expression profiles to contribute to cancer disparity outcomes such as its earlier development or progression to more aggressive disease. Advanced glycation end products (AGEs) are reactive metabolites produced as a by-product of sugar metabolism. Failure to remove these metabolites can lead to protein damage, aberrant cell signaling, increased stress responses, and decreased genetic fidelity. Critically, AGE accumulation is also directly affected by factors such as poor diet, low income, obesity and a lack of exercise. We recently reported a potential mechanistic link between AGEs and prostate cancer (PCa) which may provide a molecular consequence of our lifestyle choices that can directly impact tumor biology and contribute to cancer disparity. We examined circulating and intra-tumoral AGE levels in clinical specimens and identified a race specific, tumor dependent pattern of accumulation in PCa serum and tumor. Further mechanistic studies in immortalized PCa cell lines show that AGE treatment increases the expression of the receptor for AGEs (RAGE) to activate cancer-associated signaling cascades. Loss of function studies show that AGE mediated increases in cancer associated processes was dependent upon RAGE expression. Significantly, we show that AGEs are secreted by cancer cells and may function as signaling

molecules to promote immune cell recruitment. These data implicate the AGE-RAGE signaling axis as a potential biological mechanism promoting PCa and may represent a factor promoting PCa disparity. AGE metabolites may have high potential impact as prognostic/diagnostic markers and/or as a novel area of potential therapeutic intervention to reduce cancer disparity.

113 Genome-scale Genetic Knockout Screen Identifies Modifiers of EGFR Dependence in Non-small Cell Lung Cancer

, Jon DiMaina[1], Chris Duckworth[1], Starr E Hazard[2], Gerard Hardiman[3], Hiu Wing Cheung[1]; *[1]Pathology and Laboratory Medicine, MUSC, [2]Computational Biology Resource Center, MUSC, [3]Medicine, MUSC*.

Abstract not available.

114 Interruption of GAB2-CRKL Interaction in Ovarian Cancer

, Nathaniel R Jensen, Christopher Duckworth, Hiu Wing Cheung; *Pathology, MUSC*.

We recently found that the scaffold adapter GAB2 is amplified and overexpressed in a subset of primary high-grade serous ovarian cancers and cell lines. GAB2 mediates signal transduction from receptor tyrosine kinases to various downstream pathways. Although increasing evidence suggests an oncogenic role of GAB2 overexpression in tumor growth and metastasis, the underlying mechanisms remains poorly defined. We hypothesized that overexpression of GAB2 in ovarian cancer cells activates CRKL signaling to enhance invasion and metastasis. In this study, we identified 6 putative binding sites for adapter CRKL on the GAB2 protein. To investigate the significance of GAB2-CRKL interaction, we disrupted the putative CRKL binding sites by performing site-directed mutagenesis of GAB2 expression vector. Additionally, 5 of the putative sites are closely grouped in a CRKL Binding Region (CBR). We also created a mutant with a targeted deletion of the CBR. We will assess if expression of GAB2 mutants with disrupted CRKL binding ability will affect transforming ability and cell morphology. We also showed that GAB2 and CRKL suppression in ovarian cancer cells affects cell morphology and invasion. We will utilize a complementation approach to determine if exogenous expression of wildtype GAB2 or GAB2 mutants with disrupted CRKL binding ability in shGAB2-expressing ovarian cancer cells will restore the invasive behavior. Furthermore, there are many downstream effectors of CRKL such as C3G, SOS1, and DOCK1. We will assess the functional significance of alteration in their activation resulting from disrupted GAB2-CRKL interaction in ovarian cancer cells. We will also perform in situ proximity ligation assay to characterize the GAB2-CRKL interaction and its downstream pathways in primary high-grade serous ovarian cancers and cell lines. Therefore, this study will establish CRKL as a novel downstream effector of GAB2 overexpression to mediate ovarian cancer cell invasion and metastatic growth. *Ovarian Cancer Research Fund (292377), Department start-up fund, Abney Foundation Scholarship*

115 Comparison of Multiple Sites Monitoring Ambient Air Quality in Charleston, South Carolina

, Raymond M Boaz[1], John Pearce[2]; *[1]Biostatistics, MUSC, [2]Epidemiology, MUSC*.

Air quality monitoring is an important epidemiologic endeavor that allows for exposure assessment in public health studies relating air pollutants to health outcomes. Effective and accurate monitoring is paramount in developing clear associations in this area of public health research. Charleston, South Carolina has proposed expansion of their existing port, which could dramatically affect air quality in specific portions of the region. In order to establish whether there are differences in air quality on a community level, we have compared historic data at air quality monitoring sites that are over 10 miles apart in the Charleston area. We are looking at the air pollutants: particulate matter with 2.5mm diameter (PM2.5), particulate matter with 10mm diameter (PM10), elemental carbon, organic carbon, sulfates, nitrates, ozone, and NOx. The data at each of the three observed monitoring sites is incomplete with respect to all of the pollutants, so comparisons were made where data was present at least two of the sites. Comparisons were made by evaluating whether time series models of pollutants at individual sites were statistically significantly different from their counterpart sites. In this preliminary study, using only the existing Charleston area monitoring sites, very little variation was shown in PM2.5, sulfates, and nitrates. Comparisons on elemental carbon, organic carbon, ozone, and NOx were not possible, as there was not sufficient data from multiple sites. Elemental carbon represents the most probable air pollutant to impact the region with the expansion of the ports, as it is commonly associated with the burning of diesel fuel, which is used by both the container ships and the container trucks used to transport from the ports. Further research will involve air quality monitoring campaigns in the Charleston area, using portable monitoring equipment in order to better understand the heterogeneity of air pollutants at the community level. *NIH - R00*

116 The Current State of HIV Self-Testing Globally: A Literature Review

, Caroline J Vrana[1], Danielle R Stevens[1], Raviv Dlin[2], Jeffrey Korte[1]; *[1]Public Health Sciences, MUSC, [2]Public and Community Health, Ithaca College*.

The technology of HIV testing has evolved greatly over the years, from the first commercial blood test approved to test antibodies in blood in 1985 to the first over-the-counter rapid HIV self-test approved in in the United States in 2012. The effectiveness of these self-test kits and the ethics surrounding said tests has been greatly debated in recent years. However, HIV self-test kits have

the potential to improve testing rates around the globe, and thereby reduce HIV-related incidence and mortality. A literature review was conducted on the acceptability, feasibility, and effectiveness of HIV self-testing (HST) around the world. Study participants in the included articles were required to collect their own specimen, perform their own HIV test, and interpret some form of test results, either from their own specimen or sample results. Of the 18 articles abstracted, several aspects of HST were explored, including comparisons between oral and blood-based, supervised versus unsupervised, demonstration versus written/pictorial instructions, ability to perform the test correctly, accuracy of the test (i.e. specificity and sensitivity), user acceptance of HST, cost of the test, linkage to care, point-of-care HST, partner testing, and risk compensation. Overall, this literature review found that this diverse group of participants generally performed HST correctly with a few exceptions, were accepting of the test if available at a relatively low cost, and preferred the oral-based HST over the blood-based test. This review highlights the benefits of HST in the global population, but suggests the need to perform more research on the role of counseling in HST as well as risk compensation behaviors.

117 Role of Folate in Endometriosis Associated Ovarian Cancer (EAOC): a Case-Control Study From the Ovarian Cancer Association Consortium

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Background: Folate plays an important role in DNA synthesis and methylation. Previous studies suggested a dual role of folate in carcinogenesis: higher intakes may be protective in healthy cells but high-folate supplementation may promote progression of precursor neoplastic lesions. One important risk factor of ovarian cancer is endometriosis, which is believed to be a precursor lesion of some histological subtypes of ovarian cancer. Our aim was to evaluate the joint effects of high dietary folate intake and endometriosis on the risk of ovarian carcinoma (EAOC). Methods: We pooled data from 5 case-control studies in the Ovarian Cancer Association Consortium, including 846 endometrioid and clear cell ovarian cancer cases, and 5521 controls with folate intake and self-reported endometriosis. The strength of association between the risk of EAOC and the joint effects of folate intake and endometriosis was measured by the odds ratio (OR). Unconditional logistic regression was used to estimate ORs and 95% confidence intervals (95%CI). The initial model included all risk factors for EAOC and potential confounders. Variables in the final model were retained based on the method of backward selection and "10% change in estimate" rule to include potential confounders. Results: Among women diagnosed with endometriosis (N=484), women having above-median folate intake based on the control distribution (≥ 369 mcg/day) (N=225) were not at elevated risk of EAOC, compared to women with regular or low folate intake (< 369 mcg/day) (N=259) (OR=0.94, 95%CI=0.61, 1.45), after adjusting for study sites, age, race, menopause status, oral contraceptive use, breastfeeding status, full-term births, smoking status, and education. Conclusion: we found no evidence that high folate intake is associated with increased risk for EAOC. Studies on the joint effects of different histologic types of ovarian cancers remain a priority for future research. *NIH P30 CA138313, R01 CA54419, R01 CA83918, R01 CA112523, R01 CA87538, R01 CA58598, P30 CA072720, P50 CA105009, K07 CA095666*

118 The Role of ADAMTS5 in Dynamic Proteoglycan Turnover During Temporomandibular Joint Development and Maintenance

, Alexandra W Rogers, Christine B Kern; *Regenerative Medicine and Cell Biology, MUSC*.

Abstract not available.

119 The Effect of Asthma and Bullying on Suicidal Behaviors in Adolescents

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Introduction: Positive associations between suicidal behaviors (ideation, plan, attempt, and injuries from attempt) and asthma have been established in previous studies involving adolescents. While these studies have controlled for socioeconomic status, few have accounted for the impact of social risk factors, such as bullying (in person or electronic "cyberbullying"). This study involved an analysis of suicidal behaviors and asthma, but also includes an assessment of whether these relationships were modified by the co-occurrence of bullying. Methods: Data included responses from 13,583 participants in the 2013 Youth Risk Behavior Survey, collected by the U.S. Centers for Disease Control and Prevention. Logistic regression models appropriate for complex survey designs were used. The findings were summarized in percentages, odds ratios (OR), and 95% confidence intervals (95% CI). Results: Suicidal behaviors were common, with 17% of adolescents reporting ideation and 14% having planned a suicide attempt in the past year. Eight% had made a suicide

attempt, and 3% sustained injuries from an attempt. Both asthma and being bullied were found to be associated with suicidal behaviors. When comparing asthmatic adolescents bullied at school to asthmatics not bullied at school, the odds of suicidal ideation were increased by 40% (OR: 1.4, 95% CI: 1.1-1.8), and the odds of creating a suicide plan were 90% higher (OR: 1.9, 95% CI: 1.3 - 2.7). The odds of suicide attempt were 40% greater (OR: 1.4, 95% CI: 0.9 – 2.1), and the odds of injuries from a suicide attempt were raised by 30% (OR: 1.3, 95% CI: 0.8 - 2.2). Similar increases in the odds of suicidal behaviors were observed for asthmatics who were cyberbullied when compared to those who were not cyberbullied. Conclusion: When comparing asthmatic adolescents bullied at school or electronically to asthmatic adolescents who were not bullied, the odds of suicidal behaviors were markedly increased. *NIGMS GM072643*

120 Rapid Anastomosis of Scaffold Free Endothelial-Fibroblast Constructs

, Sanket Pattanaik, Heather Bainbridge, Stephen A Fann, Sarah Grace Dennis, Michael J Yost; *General Surgery Research, MUSC*.

Background: When the scale of tissue damage, especially in muscles, expands beyond the body's capacity to initiate its own efficient repair process, a carefully constructed patch of cells to facilitate healing seems an obvious solution. However, these constructs are subjected to stressors impacting survival of cells within a few days of implantation. To identify and contend with these stressors two strategies come to mind. The first considers whether we can decrease the time to anastomosis or perfusion of the tissue engineered construct and whether the early availability of vascular support impacts cell survival. To that end, we employ a rod-shaped scaffold free prevascularized endothelial-fibroblast construct (SPEC), which relies on human endothelial cells and fibroblasts to generate an extracellular matrix that approximates the host matrix architecture. The second strategy addresses inflammation during the early days of implantation using a connexin 43-mimetic, JM2, which interferes with purinergic signaling thought to contribute to reactive-oxidant species mediated cell death. Methods: Nine Sprague-Dawley rats were engrafted with rod-shaped SPECs into the vastus lateralis. Rods with a 5:1 mixture of fibroblasts and endothelial cells were placed into this pocket. Seeded cells were stained with a cell tracker (DiO). Three rats were implanted without additional treatment, three were provided SPECS seeded with rat satellite cells, and three were provided constructs seeded with satellite cells and provided a 20 uL JM2 solution. Rats were euthanized 24h, 72h, or 5 days following implantation. Constructs were embedded in paraffin, sectioned, and stained with hematoxylin/eosin. Results:Vessels perfused with host red blood cells were found within the constructs within all rats implanted with SPECs one day following implantation, an improvement over previously reported anastomosis of the SPEC at three days following implantation. Vessel diameter and density changes will be confirmed following immunostaining with antibodies to rat CD31/PECAM-1. DiO stained seeded cells were still visible within a day following implantation, implying successful incorporation of the SPEC. Quantification of the inflammatory infiltrate will be completed by immunostaining for myeloperoxidase (activated neutrophils) and CD68 (macrophages). *NIH T32 GM08716-13*

121 Comparing Grip Strength of the Strong and Weak Hands on the Age Continuum: A Population-based, Cross-Sectional Study of Adults with and Without Stroke in the United States

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Introduction. Stroke-related declines in strength may augment the effects of sarcopenia, the age-related loss of skeletal muscle mass and strength with negative outcomes related to hospitalization and mortality risk. A useful clinical tool in predicting these prognoses is handgrip dynamometry. The purpose of this study is to determine the effects of age on handgrip strength in community-dwelling adults with and without stroke. Methods. Using the 2011-2012 National Health and Nutrition Examination Survey (NHANES), this cross-sectional analysis included 2,092 non-stroke and 153 stroke adults (≥ 50 years) with available bilateral handgrip strength measures. Participants used a handheld dynamometer to complete three maximal isometric contractions, with the maximum average of the trials classified as the strong hand and the minimum as the weak hand. Analyses were performed with sampling weight procedures to account for the multi-stage stratified, clustered sampling method of NHANES. To determine the effect of stroke on bilateral strength, separate linear regression models were utilized. Additional separate regression models were conducted to determine the interaction effects of stroke and age on grip strength. Results. Handgrip strength in both hands was significantly less in adults with stroke. Stroke incident, age, gender, and race had significant main effects on handgrip strength ($p < 0.001$), explaining 61.9% of variance in the strong hand and 57.3% of variance in the weak hand. There was a significant interaction of stroke and age on handgrip strength in the strong hand ($p = 0.012$), but not in the weak hand ($p = 0.450$). Conclusions. Community-dwelling adults ≥50 with previous stroke showed greater declines in dominant handgrip strength across the age continuum. Given the predictive value of handgrip dynamometry for hospitalization and mortality risk, clinicians should treat strength deficits of both hands in older adults with previous stroke.

122 Anticipating Upper Extremity Motor Recovery Based on Response Patterns Produced During a Virtual Reality Game Intervention

, Scott D Hutchison, Michelle L Woodbury; *Health Science & Research, MUSC*.

Introduction: The majority (>75%) of stroke survivors exhibit moderate-severe motor impairment limiting functional hand use. There are few evidence-based therapy methods for this population. We investigated the use of Virtual Reality (VR) games as an effective therapy for such clients. Our overall goal is to explore assumptions that clients exhibit a linear recovery pattern and that this response is the same for all individuals. We hypothesize that treatment response may evolve in different ways for different people, and that response may depend on personal factors such as baseline severity and time post-stroke. Objective: To observe the day-to-day evolution of paretic upper extremity (UE) elbow extension while playing Duck Duck Punch (DDP), a Kinect®-based custom designed stroke rehabilitation VR game. Methods: Analysis of 2 case studies. Subjects played DDP for 12 sessions, ~60 minutes/session. Elbow joint angle and movement repetitions were measured continually during DDP play. Results: Subject (1), a 59 year-old female 12.6 months post left hemorrhagic CVA with moderate UE motor impairment, exhibited decreased elbow extension during the first week of game play. Then, beginning with the 6th visit, exhibited dramatic gains in elbow extension. Furthermore she did not plateau through the end of the 4-week therapy period. Subject (2), a 37 year-old female 24.9 months post left ischemic CVA, with severe UE motor impairment, exhibited no change in elbow extension over the 4-week therapy period. Conclusion: These subjects exhibited unique treatment responses that may have been influenced by motor severity level or time post-stroke. This intervention could be an innovative intervention for some moderate-severely impaired clients. A pending study will cluster response patterns categories and predict category membership based on personal factors. This information will inform therapists to identify their client's category and guide therapist to provide personalized, category specific and evidence-based intervention protocols. *Ralph H. Johnson VAMC; Rehabilitation Research and Development Merit Award; NIH/NGMS COBRE for Stroke Recovery*

123 Association Between Self-Reported Exercise and Major Depressive Disorder in Chronic Spinal Cord Injury

, Catherine J VanDerwerker, Yue Cao, Chris M Gregory, James S Krause; *Health Sciences and Research, MUSC*.

Introduction: Rates of depression after spinal cord injury (SCI) are greater than the general population. Exercise has established anti-depressant benefits in neurologically healthy individuals, but evidence supporting exercise as a modifiable risk factor for depression post-SCI is inconclusive. The purpose of this study is to investigate the association between depression and self-reported exercise in persons with chronic SCI. Methods: Cross-sectional study of 1871 individuals (74.5% male; 15.9±10.1 yrs. post-injury; 29.7% ambulatory) with chronic SCI who responded to a self-report assessment in 2014. Depressive symptomatology was assessed using the Patient Health Questionaire-9 (PHQ-9), a screening measure for depressive disorders based on DSM criteria, with a score >10 suggesting presence of major depressive disorder (MDD). Participants also answered questions regarding planned exercise and amount of exercise completed compared to others with SCI. Personal factors and injury severity were controlled for in the analysis. Results: Planned exercise twice a month to twice a week resulted in 78.60% lower odds of MDD (OR= 0.214, CI95 [0.14, 0.33], p<0.0001) while individuals who exercised ≥ 3 times a week had a 83.50% lower odds of MDD (OR= 0.165, CI95 [0.11, 0.26], p<0.0001) compared to those that planned exercise once a month or less. Furthermore, compared to those who reported exercising less than others with SCI, exercising as frequently as others with SCI lowered the odds of MDD (OR= 0.506, CI95 [0.35, 0.74], p=0.0005), as did exercising more than others with SCI (OR= 0.318, CI95 [0.21, 0.48], p<0.0001). Conclusion: This study identified a negative association between amount of self-reported exercise and odds of depression in chronic SCI. Further research is needed to explore the longitudinal relationships between exercise and depressive symptoms, and the role of exercise as a protective factor for depression as well as the potential effects of exercise as an anti-depressant treatment following SCI. *NIDRR H133B090005*

124 Disruption of MGluR/SK Inhibition in VTA Dopamine Neurons By Exposure to Stress Potentiates the Responsiveness to Cocaine

, Jeffrey Parrilla, Bethany Pavlinck, Carries Bayle, Art Riegel; *Neuroscience, MUSC*.

Environmental stressors and drugs of abuse cause enduring cellular adaptations in the ventral tegmental area (VTA) that contribute to addiction. In rats with a history of cocaine use, stressors promote relapse of drug seeking by enhancing glutamate transmission in VTA dopamine neurons. This interaction involves both corticotrophin-releasing factor (CRF) signaling and glutamate, but the relationship remains poorly understood. At ionotropic receptors, glutamate exerts excitatory actions. At postsynaptic metabotropic glutamate receptors (mGluRs), however, glutamate exerts an inhibitory action via mobilization of intracellular calcium stores to activate inhibitory sK channels. Using whole cell patch clamp electrophysiology recordings from VTA dopamine neurons, we investigated mGluR/sK channel inhibition after single or repeated exposure to the ecologically valid stressor TMT (a component of fox odor) and repeated exposure to cocaine. We observed that mGluR/sK channel inhibition was potentiated by

single exposure to TMT, but attenuated by repeated TMT exposure (4d; 15 min per day). CRF-1 and CRF-2 receptors were required for the TMT-potentiation, but not the repeated TMT-attenuation. Instead, repeated TMT exposure resulted in an unexpected increase in the frequency of spontaneous miniature outward currents (SMOCs) representing spontaneous and unsynchronized stimulation of sK channels that persisted in the presence of TTX. SMOCs were blocked by depletion of intracellular calcium stores with CPA, or by the irreversible sK channel blocker apamin. Pharmacological stabilization of ryanodine receptors (RyRs) with JVT-519 significantly decreased the frequency of SMOCs, suggesting that repeated stress causes a spontaneous leak of calcium from intracellular stores. Repeated (but not single) exposure to TMT was also associated with a robust potentiation of cocaine sensitization. We propose that repeated stress alters mGluR inhibition in VTA dopamine neurons through impairment of intracellular Ca2+ signaling and this is sufficient to facilitate cocaine related behaviors *IDA R01 DA033342; NIDA P50 DA015369*

125 The Effects of a TrkB Agonist on the Rodent Stress Response

, Jonathon A Koerber, Chantelle Ferland, Torry S Dennis, Erica Herzig, Jacqueline F McGinty; *Neuroscience, MUSC*.

Brain derived neurotrophic factor (BDNF) promotes neuronal survival and modulates the rodent stress response through activation of its high affinity tyrosine receptor kinase, TrkB. Although BDNF has tremendous preclinical value, it is hindered by its limited ability to cross the blood-brain barrier. In contrast, the selective TrkB agonist 7,8-dihydroxyflavone (7,8- DHF), readily crosses the blood-brain barrier and has therapeutic effects in several rodent studies modeling stress and learning. Furthermore, our lab has previously demonstrated that rodents repeatedly exposed to 2,4,5-trimethylthiazoline (TMT), a fox fecal extract, have an increased level of peripheral corticosterone, exhibit anxiety-like behavior in behavioral tests, and show increased reinstatement of meth-seeking that persists weeks after the initial predator odor exposure. Based on these findings and others suggesting BDNF is a modulator of stress, we decided to investigate 7,8-DHF's effect on the rodent stress response and cocaine SA. We exposed rats to a filter paper soaked in TMT (10 ul, 1% solution, 15 min. sessions) or saline (10 ul, 15 min. sessions) once daily for five days in open field boxes, after three days of pre-exposure habituation. Two hours before the trials, we administered either 7,8-DHF (5 mg/kg, i.p.) or vehicle to investigate whether 7,8-DHF would attenuate any component of the stress response induced by exposure to the predator odor. Rats were then allowed to self-administer cocaine in 2h sessions and tested in various reinstatement paradigms. Immediately following the final reinstatement test, rats were decapitated without anesthesia, their brains were extracted, and tissue was collected from the dorsomedial prefrontal cortex (dmPFC), amygdala (AMY), paraventricular nucleus (PVN), and hippocampus (HIP). Protein and mRNA levels will be analyzed using the WES system (Protein Simple) and qPCR, respectively. It is expected that the TMT-exposed rats will have augmented levels of bdnf mRNA and p-TrkB, which will be prevented by 7,8-DHF. *DA033479 and GAANN*

126 The Representation of Semantic Content and Attentional State in Temporal Lobe During Visual Processing of Natural Scenes: an ECoG Study

, Zahraa N Sabra, Jessica Breedlove, Leonardo Bonilha, Thomas Naselaris; *Neurosciences, MUSC*.

Brain areas within the medial temporal lobe (MTL) are critical for a variety of cognitive functions, most notably declarative memory. MTL is also anatomically and functionally connected to areas within the ventral visual stream. However, the role of MTL in ventral stream visual processing is currently unclear. MTL may act primarily as a source of purely cognitive, top-down signals that modulate visual processing; it may also be possible that it has a more purely sensory role in the ventral stream representation of the semantic content of scenes. To address this issue, we recorded electrocorticographic (ECoG) potentials from the MTL to determine if variation in neural activity in MTL is driven by changes in attentional state or in stimulus content. Six patients implanted bilaterally or unilaterally with depth electrodes in MTL and surrounding areas (amygdala, insula, anterior cingulate gyrus and middle temporal gyrus) viewed a stream of natural scenes that prominently featured a face, building, or car. Subjects were instructed to attend to one stimulus category across 15 blocks of 30 images each. The attended category was fixed during each block, while the stimulus category was randomly interleaved. For each attentional/stimulus condition (e.g. attend face/view car), we estimated a distinct finite impulse response function (FIR) and quantified the variation in the FIR due to changes in the attended category, as well as due to changes in the stimulus category. We observed that FIR responses to changes in attended category or stimulus category were lateralized in several regions within the temporal lobe and that the hippocampus encodes both attentional and stimulus variations. We then utilized a linear regression classifiers to decode the response of MTL regions to attentional/stimulus conditions. The classifier was able to decode responses from the middle temporal lobe and anterior cingulate with significant difference compared to random guess. Our results suggest that variation of activity in MTL is not only driven by the attended category, but also by variation in stimulus category indicating that visual processing of natural scenes also occurs beyond the conventional visual processing sites. *R01 EY023384*

127 Are Pericytes Liaisons Between Neurons and Vascular Smooth Muscle Cells?

David A Hartmann, Andy Y Shih; *Neuroscience, MUSC*.

Abstract not available.

128 Right Inferior Frontal Gyrus Inhibitory-Control-Associated BOLD Activation and Grey Matter Volume Independently Predict Smoking Cessation Outcomes

, Patrick A McConnell[1], Amanda Mathew[1], Maggie Sweitzer[2], Joseph F McClernon[2], Brett Froeliger[1]; *[1]Neurosciences, MUSC, [2]Psychiatry & Behavioral Sciences, DUKE*.

Abstract not available.

129 Predictive Coding Model of Mental Imagery

, Jesse L Breedlove[1], Nicholas DeSisto[2], Thomas Naselaris[1]; *[1]Neurosciences, MUSC, [2]Computer Science, CofC*.

Rationale: Mental images play an essential role in our daily cognitive experiences including memory recall and spatial navigation. However, when these internal perceptions are distorted or invasive, they can be associated with pathological conditions. Despite the immense clinical and cognitive relevance, little is known about the mechanisms underlying this perceptual phenomena. Recently, neuroimaging studies have revealed that mental imagery engages the same brain areas as those used for vision, but its function as a visual phenomenon is still unclear. Our overall hypothesis is that mental images are the result of predictive coding. This theory describes vision as a constant exchange of predictions and errors between higher and lower visual areas. Within this model, mental imagery is equated with top-down prediction signals that are transmitted to lower visual processing nodes. If true, this would imply an upper bound on the resolution of imagined scenes in primary visual areas. We predict that receptive fields (RF) in V1/V2 during mental imagery will be no smaller than the size of receptive fields in intermediate areas during perception. Methods: We measured the BOLD activity in the brains of participants as they viewed, and then imagined, visual scenes within the fMRI scanner. After preprocessing and de-noising the data, a voxel-wise population-RF model was applied to estimate the size and location of RFs belonging to voxels of the visual cortex. Results: Our early results have suggested that seeing and imagining visual scenes results in differing but related patterns of RFs in the visual areas of the brain. The population-RF model has demonstrated that receptive field sizes during participation in mental imagery are larger and more spread out about the center of the visual field. Conclusions: These preliminary results demonstrate the feasibility of quantifying mental imagery RFs as way of exploring the functional role of imagery in vision. *NEI RO1-EY023384*

130 More Than Meets the Eye: What Visual Cortex Reactivity to Cues May Tell Us About Neural Processing in Addiction

, Logan T Dowdle[1], Thomas Naselaris[2], Brett Froeliger[2], Colleen A Hanlon[1]; *[1]Psychiatry, MUSC, [2]Neurosciences, MUSC*.

Aims: The visual cortex has not received a large amount of attention in fMRI drug-cue reactivity literature, despite its consistent and significant response in drug users who are exposed to substance cues. This literature review has two discrete sections – 1) results from a recent meta-analysis on visual cortex reactivity and 2) pilot data from a prospective study on visual cue reactivity. Results: The meta-analysis revealed that 86% of drug-cue reactivity neuroimaging studies found significantly more activity in the visual cortex (BA 17 and 19) to drug cues versus neutral cues. This was consistent across diverse drug classes, including nicotine, cocaine, alcohol, and opiates. These findings were then directly tested in a prospective manner using multiband imaging in a cohort of nicotine smokers and non-smokers viewing cigarette images and neutral images, resulting in different patterns of activation within the primary visual cortices of smokers, as compared to healthy controls. Conclusions: Together these data demonstrate that the visual cortex, though often overlooked, in our discussions of the neural circuitry of addiction, consistently discriminates drug cues from neutral cues in substance dependent populations. Although it is unclear whether this is related to the rewarding properties of the drug or attentional mechanisms, these data suggest that this is a fruitful new area of exploration in addiction research. *NIDA R01 DA033459B*

131 Alterations in Cortical Laterality Among Individuals At Risk for Stroke: A Functional MRI Study in Controls and Patients

, Daniel H Lench, Christopher Austelle, Colleen Hanlon; *Neuroscience, MUSC*.

It is well-known that the first year after a stroke is a dynamic period for brain recovery. One of the hallmarks of this period is that stroke patients begin to use both the left and right hemisphere motor circuitry to perform a unimanual task. Although this pattern may be positive during acute stroke recovery, chronic stroke patients that are unable to restore the typical pattern of lateralized activity often have the worst outcomes. The goal of this study was to test the hypothesis that this bilateral activity is actually present before the stroke in individuals at risk for stroke. Functional MRI data and a comprehensive battery of motor assessments were acquired from 22 individuals - a cohort of 11 chronic stroke patients with upper extremity weakness (and 11 participants at-risk for stroke (at least 2 cardiovascular risk factors). During the neuroimaging session, the participants performed a squeezing task with their left and right hands. Percent BOLD signal change was extracted from the caudate, pallidum, precentral gyrus, putamen, SMA and thalamus

during the hand pulsing task and rest. These preliminary data were compared with a previous cohort of individuals that did not have these risk factors. As expected precentral gyrus percent signal change increased when using the contralateral hand in controls. The laterality index in the at-risk participants was lower (less lateralized) than the healthy control, but it was not as low as in the stroke patients. This was particularly true in the cortical areas including the motor and premotor corticies. These data suggest that there is a high degree of variability in the laterality indicies among individuals that have not had a stroke. It is possible then that some of these premorbid patterns may account for the lack of "relateralization" that is observed many chronic stroke patients. *P20 GM109040; P20 GM109040; TL1 TR001451*

132 In Vivo Exposure Phenotype and Stem Cell Transcriptomics to Determine If Dioctyl Sodium Sulfosuccinate (DOSS) is a Bona Fide Obesogen

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The percentage of obese children and adults has increased at an alarming rate over the last three decades. While diet, exercise and genetics play are central to obesity, environmental exposures to obesogens may also contribute. Identification of obesogens will aid our understanding the etiology of obesity. Previously we evaluated MC252 oil and Corexit 9500 dispersant mixtures for obesogens and identified DOSS as a putative obesogen. Our current focus is on validating DOSS as an obesogen through phenotyping after exposures in mice and by comparing the transcriptional responses to DOSS using mouse-derived mesenchymal stem cells (MSCs), the progenitors of fat cells and human induced pluripotent stem cells (iPSCs) via next generation RNA-sequencing. Phenotyping results indicate that in vivo exposure to DOSS upregulates a key player in fat cell differentiation, PPARγ in liver and adipose tissues. Similarly, MSCs isolated from exposed mice display increased adipocyte differentiation and gene expression analysis indicates an upregulation of adipogenic genes in these cells. In addition, iPSCs exposed to DOSS display a unique transcriptomic profile compared to iPSCs exposed to the PPARγ agonist rosiglitazone. Upregualted pathways include those involved in lipid homeostasis and steroid biosynthesis. MSCs exposed to DOSS display similar gene expression profiles. Together these data can help predict and assess health risks associated with DOSS exposure in terrestrial and marine organisms.

133 Role of the N-terminal Domain of Major Ampullate Spidroin 1 of Nephila Clavipes in Spider Silk Formation

James H Atkison, Mirko Hennig, Shaun K Olsen; *Biochemistry and Molecular Biology, MUSC*.

Spider dragline silk is a naturally occurring polymer that has the potential to be used in many biomaterials, such as skin graft scaffolds and cartilage repair matrices, due to its elasticity, high tensile strength, and biocompatibility. However, natural large scale production of spider silk is unfeasible due to the cannibalistic nature of spiders kept in captivity. Therefore, it is critical to understand the mechanisms by which individual proteins, called spidroins, are formed in the glands of the spider, then spun into insoluble fibers for web construction, so that this process can be replicated ex vivo. Spidroins consist of long, repetitive blocks flanked by distinct N- and C-terminal domains. The N-terminal domain (NTD) is critical to the organization of the individual spidroins so they can form insoluble fibers. Using the NTD of major ampullate spidroin 1 (MaSp1) of Nephila clavipes as our model, we have generated a series of point mutations and have employed covalent crosslinking, size exclusion chromatography, and tryptophan fluorescence to confirm the effects of pH and salt concentration on NTD dimer formation. NMR relaxation and pH and salt titrations were used to investigate the residue-specific dynamics of dimer formation. X-ray crystallography was employed to solve the structures of the WT and point-mutants in specific conditions. We conclude that the dimerization process relies on oppositely charged residues to form intersubunit salt bridges to align two monomers for dimerization. Handshake interactions between two sets of acidic residues within each subunit are responsible for rotating the helices involved in the dimer interface. We suspect that this novel rotation mechanism provides a degree of flexibility that facilitates the dimer formation during spider silk formation.

134 Biomechanics of Temporomandibular Joint on Body Level

Feng Wei[1], Mark H Van Horn[2], Jeffrey C Nickel[3], Hai Yao[1]; [1]Bioengineering, Clemson University, [2]Radiology and Radiological Sciences, MUSC, [3]Orthodontics and Dentofacial Orthopedics, UMKC.

Abstract not available.

135 The Effect of Education on Wealth: Trends and Predictors of Wealth in Kenya Between 1993 and 2008-09

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In developing sub-Saharan countries wealth at individual level is difficult to measure due to a lack of reliable data on income and expenditures. A relative measure of

wealth at the household level, however, is provided by the Demographic and Health Surveys (DHS) wealth index. This index is constructed from the household assets and can be used to compare household wealth in one country at a given point in time. To generate an absolute measure of wealth for comparison over time, we developed a harmonized wealth index for Kenya using four DHS surveys conducted in 1993, 1998, 2003, and 2008-09. Categories from later surveys were collapsed (harmonized) to match earlier surveys with fewer categories, and then factor analysis was performed on the pooled data. Possible predictors of wealth were selected from household variables available for all four years. To correct for over-sampling or under-sampling, household sampling weights were used in the analyses. When determining predictors of wealth, stratification by rural or urban regions was used because the wealth index was more specific to urban areas. For urban areas, the observed means indicate an increase in wealth over time, whereas the model based means indicate a non-linear relationship between wealth and time, with a decrease in wealth from 1993 to 1998 and a steeper increase from 2003 to 2008/2009. For rural areas, both observed and model based means suggest a linear increasing trend in wealth over time. Wealth consistently increased with higher levels of education. For both urban and rural regions, education was the strongest predictor of wealth. Additionally, where a woman was head-of-household or head-of-household had a partner, households had a higher corresponding wealth index in urban areas, but lower in rural areas, after adjusting for age, level of education and district.

136 Mechanism of 5-Hydroxytryptamine 1F Receptor Stimulation of Mitochondrial Biogenesis in the Kidney

Mechanism of 5-Hydroxytryptamine 1F Receptor Stimulation of Mitochondrial Biogenesis in the Kidney, Whitey S Gibbs, Craig C Beeson, Rick G Schnellmann; *Drug Discovery and Biomedical Sciences, MUSC*.

Background: Pharmacological induction of mitochondrial biogenesis (MB), the process of creating new mitochondria to replace damaged mitochondria, is a potential therapeutic target for AKI. Our laboratory has demonstrated that LY344864, a selective 5-HT1F receptor agonist, promotes recovery from AKI as demonstrated by an increase in MB and decreased BUN and Kim-1 in a mouse model of ischemia/reperfusion AKI. While the 5-HT1F receptor is a Gi- coupled GPCR, the mechanism of 5-HT1F receptor mediated MB is unknown. Methods: Mitochondrial respiration was measured in renal proximal tubule cells (RPTC) using a Seahorse XF Extracellular Flux Analyzer. Signaling pathways were explored using pharmacological inhibitors and immunoblot analysis. Results: LY344864 (10 nM) increased FCCP-uncoupled respiration in RPTC, a marker of MB. LY344864 induced FCCP-uncoupled respiration was attenuated by pretreatment with gallein, L-NAME, and ODQ, pharmacological inhibitors of Gβγ, nitric oxide synthase, and soluble guanylyl cyclase, respectively. LY344864 upregulated p-Akt and p-eNOS protein expression after 15 min and 1 hr exposures, respectively. Gallein blocked increases in both p-Akt and p-eNOS following LY366864 treatment. Following pretreatment with MK2206, an Akt inhibitor, the increase in p-eNOS protein expression was attenuated. Conclusion: This study reports the novel finding that Gβγ heterodimer initiates MB and does so through a new pathway. Specifically, 5-HT1F stimulation of Gβγ activates Akt and eNOS, leading to the induction of MB. The identification of this pathway provides additional therapeutic targets for a drug intervention which could treat AKI. *NIH R01 GM084147; T32 DK083262; VA BX-000851*

137 Susceptibility of Mitochondrial Mutant Zebrafish to Sublethal Levels of Common Toxicants

Susceptibility of Mitochondrial Mutant Zebrafish to Sublethal Levels of Common Toxicants, Tucker J Williamson, Jennifer J Rahn, Sherine SL Chan; *Drug Discovery and Biomedical Science, MUSC*.

Abstract not available.

138 Self-Efficacy and Its Impact On Post-Stroke Rehabilitation

Self-Efficacy and Its Impact On Post-Stroke Rehabilitation, Kelly R Anderson, Scott Hutchison, Michelle Woodbury; *Health and Rehabilitation Science, MUSC*.

Introduction: Stroke is the leading cause of disability in South Carolina. Self-efficacy (SE), which is defined as a person's belief in their ability to reach their goal or accomplish a task, has been shown to affect the effort a person is willing to put into rehabilitation. Therefore it is important to understand the factors contributing to a person's self-efficacy and if self-efficacy impacts rehabilitation outcomes. Objectives: 1) Determine if there are personal factors correlated with baseline self-efficacy levels 2) Determine the impact of self-efficacy level on response to rehabilitation treatment. Methods: Setting: Secondary analysis of ongoing upper extremity (UE) rehabilitation intervention study focused on task specific practice. Participants: 34 subjects (10 female), ages 19-77, 3-116 months post stroke, without cognitive or orthopedic impairment. Measurement: UE functional use (Wolf Motor Function Test), baseline stroke severity (Fugl-Meyer Upper Extremity Assessment), Self-efficacy (Fatalism Scale), Perceived recovery (self-report on the Stroke Impact Scale). Analysis: Spearman's rho correlations ($p<0.05$). Results: Age($r=0.04$, $p=0.83$), stroke severity ($r=0.05$, $p=0.79$) and time post stroke ($r=0.03$, $p=0.88$) were not significantly correlated with initial level of self-efficacy. Baseline level of self-perceived recovery was significantly correlated with self-efficacy level ($r=0.37$, $p=0.04$). Changes in activity level($r=-0.27$, $p=0.89$) functional use of the arm ($r=0.25$, $p=0.19$), and perceived recovery ($r=-0.06$, $p=0.78$) after 1 month of rehabilitation did not correlate with baseline self-efficacy levels. Conclusion: Results suggest that self-efficacy may influence a person's initial perception of their recovery but does not affect their response to rehabilitation treatment. One major limitation of the study is that participants volunteered to participate in research

therapy and therefore may not fully represent the typical post-stroke community dwelling population. *Ralph H. Johnson VAMC, Rehabilitation Research and Development Merit Award NO7799-R*

139 Use of the Rasch Measurement Model to Investigate Measurement Properties for the Dynamic Gait Index in Stroke

, Stacey E Aaron[1], Ickpyo Hong[1], Mark G Bowden[1], Chris M Gregory[1], Aaron E Embry[1], Craig A Velozo[2]; *[1]Health Sciences and Research, MUSC, [2]Occupational Therapy, MUSC*.

Introduction/Rational: Many individuals post-stroke experience balance and mobility issues. These functional limitations can result in an increased risk of falling, which can have severe implications for independence and quality of life. The Dynamic Gait Index (DGI) is a clinical assessment commonly used with stroke to evaluate functional stability during gait activities, as well as risk of falling. The use of this instrument can assist in treatment selection and tracking progress. The purpose of this study was to use Rasch measurement to examine if the DGI 1) meets suggested psychometric guidelines (unidimensionality, fit statistics, local independency, and test reliability) and 2) if the item difficulty hierarchical order of the 8 items are consistent with clinically logical progression from easiest to hardest. Methods: Secondary data analysis from multiple studies included 117 individuals with stroke (mean age= 50±12.8; 70 males; 55 right hemiparetic). The psychometrics of the DGI was tested with Rasch measurement model using the WINSTEPS program. Dimensionality was tested with confirmatory factor analysis (CFA) with 1-factor solution using the Mplus program. Results: Overall, the DGI demonstrated acceptable psychometric properties: dimensionality (CFA: RMSEA=0.098, CFI=0.975, TLI=0.965), no misfit items to the Rasch model, local independent (all item residual correlations<0.2), and a good test reliability (Cronbach alpha of 0.86). The item-level analysis revealed a clear item difficulty hierarchical order that is generally consistent with clinical observation and expectations. While the instrument is separating the individuals into 3 significant strata, person distribution is 0.70 logits higher than instrument items. Conclusion: The DGI demonstrated good item-level psychometric properties and an expected hierarchical order when used in individuals with stroke. However, adding more challenging items may improve precisions and person-item matching. Therefore, individuals can receive treatments that better fit their needs and therapists can track functional changes over time.

140 Characterizing Patterns of Thyroid Function and Regulation in the Late-Stage Embryonic American Alligator

, Thomas M Galligan[1], Ashley SP Boggs[2], Benjamin B Parrott[1], Louis J Guillette[1]; *[1]Obstetrics and Gynecology, MUSC, [2]National Institute of Standards and Technology*.

The thyroid gland is an endocrine organ involved in many physiological and developmental processes in vertebrates, including regulation of metabolism and formation of the pulmonary, skeletal, and central nervous systems. Disruption of the thyroid, especially during early development, can lead to serious metabolic and developmental disorders. The American alligator (Alligator mississippiensis) is an important sentinel species for environmental endocrine disruption. However, little is known about the development of thyroid in the alligator, limiting its current utility as a sentinel species for thyroid disruption. The purpose of this study is to characterize patterns of thyroid function and regulation in the late-stage embryonic alligator. In the domesticated chicken (Gallus gallus domesticus), a closely related species, thyroid hormone (TH) production begins between embryonic days 7-10 (ED7-10; analogous to embryonic stages 19-21 in A. mississippiensis), and increases progressively during the final trimester of development, peaking at hatch. Therefore, we expect to observe a progressive increase in the productive capacity of the thyroid during the final trimester of development in the alligator, as indicated by increasing expression of genes required for TH biosynthesis. To test this hypothesis, A. mississippiensis eggs were collected from a wild population at Lake Woodruff National Wildlife Refuge, Florida, USA in June 2015, and were incubated in the laboratory. Embryos were euthanized between stages 17-27, and thyroid tissues were collected. Thyroidal RNA will be extracted, and RT-qPCR will be used to measure expression of thyroglobulin, sodium/iodide symporter, pendrin, thyroid peroxidase, and thyrotropin receptor, all of which are critical for TH production. This study will lend insight into the functional development of the thyroid in the American alligator, and enable future studies of thyroid disruption in this ecologically relevant sentinel species. *Smart State SC Centers of Economic Excellence*

141 Mercury Found in MC252 & CWAF Depleted MC252 Can Be Transmitted Through the American Alligator Eggshell to the Embryo

, Frances M Nilsen[1], Stephen E Long[2], Louis J Guillette[3], Demetri D Spyropoulos[4]; *[1]Environmental Chemical Sciences, NIST, [2]Chemical Sciences, NIST, [3]Obgyn, MUSC, [4]Pathology, MUSC*.

The American alligator (Alligator mississippiensis) is an ideal bio-accumulating and bio-concentrating sentinel species. It is a long-lived top predator with high location fidelity, endemic to the coastal wetlands of Southeastern

United States (North Carolina to Texas). Anthropogenic contaminants, including coastal oil spills present a threat to these sentinels and their ecosystem. This is especially the case for heavy metals such as mercury, which has known potent and deleterious impacts on human and wildlife development. Here, we measured the total mercury fraction of MC252 oil, COREXIT water accommodated MC252 oil (CWAF), CWAF-depleted MC252, and standard cell culture media (the aqueous 'water' portion of CWAF). We find that both MC252 and CWAF-depleted MC252 have concentrations of mercury above the limits of our detection and, within the range of concentrations that have previously been shown to elicit deleterious effects on developing organisms (2.9 ± 2.1 ng/g, 6.8 ± 4.4 ng/g, respectively). We next asked whether transmission of mercury occurs through the alligator eggshell. As proof of principle, we applied varying doses of methylmercury to the outside of the eggshell (5ng/g, 96ng/g, and 375ng/g) and determined that a greater proportion of lower doses of mercury transited through the chorioallantoic membrane into the embryo after 14 days, but the higher doses transited faster, and more profoundly influence early stages of development. We will present data comparing mercury transmission of MC252 oil and CWAF-depleted MC252 oil and their impacts on alligator development as well as an eggshell pore density comparison used to determine the variability within and between nests. This study lends insight into to the potential added risk of mercury from oil spills impacting developing alligator and other wildlife embryos, and possibly impacting the human population of this important coastal wetland. *NIST*

142 SPARC Influences Collagen Fiber Morphology and Monocyte Activity in a Murine Model of Periodontal Disease

, Emilie Rosset[1], Jessica Trombetta-eSilva[1], Amy D Bradshaw[2]; *[1]Dental Medicine, MUSC, [2]Medicine, MUSC*.

The periodontal ligament (PDL) is a fibrous connective tissue anchoring tooth into alveolar bone with a high collagen turnover rate within the extracellular matrix (ECM). Secreted protein acidic and rich in cysteine (SPARC) is a matricellular collagen-binding protein expressed in the PDL. SPARC-null mice demonstrate that collagen fiber thickness and total content is regulated in the ECM of the PDL by SPARC. Studies in long bone homeostasis implicate SPARC in osteoblast defects leading to osteopenia. Our current study aims to determine differences in collagen morphology and bone turnover in tissues of the periodontium in response to inflammation. To induce periodontal disease, the 2nd molar was ligated in WT and transgenic mice with abrogated expression of SPARC. PSR staining showed significant decreases in total collagen I content as well as thick fiber volume fraction in the PDL of SPARC-null mice compared to WT. Inflammatory cells play key roles in regulating the ECM. We sought to determine differences in inflammatory cell numbers in SPARC-null and WT. A significant decrease in alveolar bone was observed in mice of both genotypes. Alveolar bone loss was further exaggerated in SPARC-null compared to WT. Although, SPARC-null mice exhibited increased bone loss, TRAP staining indicated decreased osteoclast activity compared to WT. An increase in osteoclast activity contrasts previous results in long bones of SPARC-null mice where differences in osteoblast function were more significant. Macrophages detected with anti-F4/80 antibody indicated a trend toward fewer macrophages in SPARC-null compared to WT. Osteoclasts are known to derive from macrophages; decreases in osteoclast activity might be associated with decreases in macrophage numbers in injured PDL. Future studies to elucidate mechanistic roles of SPARC in inflammatory cell recruitment and collagen turnover in bone and PDL will provide novel insight into the role of the ECM in the inflammatory response in periodontal disease. *VA 1BX001385, AHA 13GRNT16500000, P30 GM103331, T32 DE017551*

143 Inhibition of Class I Histone Deacetylases At Reperfusion Attenuates Ischemia-Reperfusion Injury and Modifies Mitochondrial Acetylation

, Daniel J Herr[1], Sverre E Aune[1], Donald R Menick[2]; *[1]Medicine, MUSC, [2]Ralph H. Johnson VA Medical Center*.

Although rapid reperfusion of ischemic tissue is the treatment of choice for myocardial infarction, much of the resultant damage occurs as a result of reperfusion itself. Previously, we have shown that pretreatment with MS-275, a selective class I histone deacetylase (HDAC) inhibitor, rescues left-ventricular (LV) function and substantially reduces the area of infarcted tissue in isolated rat hearts subjected to ischemia-reperfusion (IR) injury. Here, we tested the hypothesis that MS-275 treatment at reperfusion reduces LV tissue damage and improves post-ischemic LV contractile function. To do this, hearts from male Sprague-Dawley rats were isolated and perfused ex vivo on a Langendorff perfusion apparatus. A saline-filled balloon was inserted into the left ventricle of the heart to monitor ventricular pressure development throughout the experiment. Hearts were subjected to 30 minutes of ischemia, followed by 60 minutes of reperfusion. MS-275 was administered during the entire reperfusion phase, and resultant functional data were compared to untreated hearts. There was no difference in any metric of pre-ischemic contractile function between groups. Class I HDAC inhibition at reperfusion significantly improved multiple measures of LV function, including dP/dtmax, -dP/dtmax, developed pressure and minimum diastolic pressure. We also observed a 60% reduction in infarct area of MS-275 treated hearts compared to control, as measured by 2,3,5-triphenyltetrazolium chloride (TTC) staining. Unexpectedly, mass spectrometry analysis revealed significant changes in acetylation state of multiple mitochondrial enzymes. Administration of MS-275 during the reperfusion phase of IR is sufficient to partially preserve LV function during ischemia reperfusion injury. This study emphasizes the importance of exploring class I HDAC inhibitors for protection against ischemia-

reperfusion. *VA merit award BX002327-01; NIH/NCATS TL1 TR 000061 and UL1 TR 000062, T32 GM008716, and T32 HL007260*

144 Neural and Behavioral Correlates of Inhibitory Control and Cigarette Smoking,

Spencer Bell[1], Christie Eichberg[1], Patrick McConnell[1], F J McClernon[2], Brett Froeliger[1]; *[1]Neurosciences, MUSC, [2]Psychiatry and Behavioral Sciences, Duke University*.

Introduction: Addiction is associated with inhibitory control deficits; however the bio-behavioral mechanisms underlying inhibitory control and cigarette smoking behavior remain poorly characterized. The present study examined relations between inhibitory control and smoking behavior, a greater understanding of which may provide valuable predictors for lapse/relapse vulnerability among smokers attempting to quit. Methods: Healthy non-smokers (n=28) and sated smokers (n=28) performed a Go-NoGo task during functional MRI. Task-related BOLD response was examined within an inhibitory-control network (bilateral inferior frontal gyrus [IFG], precentral gyrus, insula, and pre-supplementary motor area [SMA]). Smokers then completed a smoking resistance task in which a monetary incentive was provided to refrain from smoking and smoking topography was subsequently measured. For comparison, the nonsmoker group performed a time-control version of the task. Results: Groups did not significantly differ in performance on the Go-NoGo task or the smoking resistance task (p's>0.25). However, among smokers, inhibitory control (i.e. NoGo accuracy) was associated with longer latency to initiate smoking (Beta=.391, t=2.028, p=.05) and a fewer number of puffs (Beta=-0.347, t=-1.799, p=0.09). With regard to inhibitory control-BOLD response, as compared to nonsmokers, smokers exhibited less activation in multiple nodes of the inhibitory control network; including bilateral posterior insula, left IFG, right precentral gyrus, and right SMA. Conclusions: Inhibitory control during the Go-NoGo task predicts capacity to resist smoking and degree of nicotine self-administration, suggesting that this measure may reflect vulnerability for lapse and/or relapse among smokers during a quit attempt. Further, these findings may provide neuroanatomical biomarkers to target treatment for inhibitory control deficits and smoking cessation (e.g. rTMS, cognitive training). *NIH NIDA: T32 DA 7288-23 S1; NIH NIDA R01 DA033459*

145 Cocaine Self-administration and Cue-reinstatement Disrupt Kv7 (KCNQ) Channel Inhibition in the Prefrontal Cortex,

William Buchta, Arthur Riegel; *Neurobiology of Addiction Research Center, MUSC*.

Abstract not available.

146 Investigating the Developmental Etiology of Altered Ovarian Responsiveness to Gonadotropin in the American Alligator, Alligator Mississippiensis,

Matthew D Hale, Jessica Cloy-McCoy, Thomas M Galligan, Brenna Doheny, Satomi Kohno, Louis J Guillette, Benjamin B Parrott; *Obstetrics and Gynecology, MUSC*.

Lake Apopka (Orange County, FL) is a site well-characterized by decades of anthropogenic pesticide and nutrient pollution. A large body of work from this site on the American alligator has uncovered similarly elevated levels (mg/kg) of DDT and metabolites in adults and in eggs, which are endocrine-disrupting chemicals (EDCs). Exposure to these chemicals at Apopka has been associated with: reduced fertility and hatch rates; altered steroidogenic capacity and hormone levels; and altered gonadal development and morphology. Furthermore, recent work in our lab utilizing animals collected as embryos from Lake Apopka and a reference site, Lake Woodruff, has described significantly attenuated ovarian responsiveness to exogenous gonadotropins and a general loss of sexually dimorphic gene expression in Apopka animals. We hypothesize that the origins of this altered responsiveness are putatively developmental, and result from exposure to sex hormone-like EDCs prior to and during the window of sex determination. To further explore these observations and to probe and recapitulate the effects of developmental exposure to EDCs, we returned to these sites and collected embryos post-oviposition. Eggs were incubated at female-producing temperatures, topically exposed to estrogen or a non-aromatizable androgen (DHT) immediately prior to sex determination, and then raised post-hatching for 5 months. At that point, animals received repeated intramuscular injections of follicle-stimulating hormone (FSH) for one week and were subsequently sacrificed. Endpoints assessed include: body and tissue morphometrics; growth rates; circulating hormone levels; ovarian morphology, follicle number and developmental stage; and induction of FSH-responsive genes. These data will be presented. Future directions include the continued elucidation of mechanisms underlying the phenotype of altered responsiveness, such as altered methylome patterning, and the extension of this question into the context of human reproductive health and function. *SC SmartState CoEE Marine Genomics*

147 Eicosanomics: Novel Approaches to Investigate the Effect of Oil/dispersant Exposure on Eicosanoid Synthesis in the Chorioallantoic Membrane of Sentinel Species,

Theresa M Cantu[1], Alexis Temkin[2], John Bowden[1], Demetri Spyropoulos[2]; *[1]Obstetrics and Gynecology, MUSC, [2]Pathology, MUSC*.

Abstract not available.

148 MK2 Signaling Regulates Monocyte Plasticity During Aggregatibacter Actinomycetemcomitans-induced Inflammatory Bone Loss

, Bethany A Herbert, Heidi Steinkamp, Keith L Kirkwood; *Oral Health Sciences and the Center for Oral Health Research, MUSC*.

Aggregatibacter actinomycetemcomitans (A.a.) is associated with aggressive periodontal disease (PD) characterized by inflammation coupled with bone loss. Monocyte precursors differentiate into macrophages or bone resorbing osteoclasts, both of which are critical in PD pathogenesis. Furthermore, macrophages secrete inflammatory cytokines that drive osteoclast formation. Interestingly, a mitogen activated protein kinase, MK2, regulates pro-inflammatory cytokines and osteoclast formation. Therefore, the objective is to demonstrate that MK2 signaling is critical for monocyte precursor differentiation during A.a. infection. Mk2+/+ and Mk2-/- mice were treated with live A.a. or PBS control at the mid-sagittal suture for 3-5 days. Calvariae were harvested for uCT, histological staining, RNA, and protein. Peripheral blood (PB) and bone marrow (BM) were harvested for flow cytometry and cytokine multiplex assays. In vitro, BM derived macrophages were differentiated by CD11b+ magnetic bead sorting and M-CSF stimulation. Calvarial tissue and BM macrophages stimulated with A.a. had increased MK2 and p-MK2 levels. Nanostring analysis of tissue RNA revealed that macrophage markers Emr1/F4/80 ($P \leq 0.01$) and Itgam/CD11b ($P \leq 0.05$) were reduced in Mk2-/- mice during A.a. challenge. Osteoclastogenesis stimulating Tnfsf11/RANKL was also attenuated in the absence of MK2 ($P \leq 0.05$). Additionally, tissue ($P \leq 0.05$) and circulating IL-6 were regulated by MK2. Calvariae resorption pits enumerated by uCT were significantly reduced in Mk2-/- compared to Mk2+/+ mice after A.a. treatment ($P \leq 0.01$). Osteoclast formation, delineated by TRAP positive staining, was also positively regulated by MK2. During A.a. challenge, mice up-regulated PB macrophage and osteoclast progenitors with shared CD11b+Ly6ChiCCR2hi lineages independent of MK2 signaling, demonstrated by flow cytometry. Thus, MK2 signaling regulates monocyte/macrophage and osteoclast formation during A.a. infection. These results provide insight into modulation of MK2 as a potential PD therapeutic. *NIH F30 DE02436, T32 DE017551, R01 DE021423, and P30 GM103331*

149 Elucidating Oncogene Targets in the 8p11-p12 Amplicon to Treat Breast Cancer

, Alexandria C Rutkovsky, Stephen P Ethier; *Pathology and Laboratory Medicine, MUSC*.

Abstract not available.

150 The Role of PTEN in Basal-Like 2 Triple Negative Breast Cancer

, Ericka L Smith, Christiana Kappler, Stephen P Ethier; *Pathology, MUSC*.

Triple negative breast cancer (TNBC) is a highly heterogeneous and aggressive disease, lacking expression of estrogen receptor (ER), progesterone receptor (PR), and epidermal growth factor receptor 2 (HER2). Molecular profiling has shown that there are six different subtypes of TNBC including the basal-like 2 (BL2) subtype. Gene expression profiling of the BL2 subtype, shows heavy enrichment for signaling pathways such as EGFR and Wnt signaling. Common molecular alterations observed in the BL2 subtype are mutated p53, epidermal growth factor receptor (EGFR) over-expression, and loss of phosphatase and tensin homolog (PTEN) expression. PTEN, functions primarily by antagonizing the PI3K pathway, leading to a reduction in downstream signaling. Studies from our lab have shown that SUM-149, a BL2 TNBC cell line, has high levels of phosphorylated Akt (downstream effector of PI3K) and increased levels of Wnt signaling pathway components. To understand how Wnt signaling is functioning in our cells, SUM-149's were transduced with a GFP reporter construct, driven by β-catenin binding of TCF/LEF in the nucleus, and were plated in 3D culture in stem cell media. This showed a distinct subpopulation of cells displaying active Wnt/β-catenin signaling. Wnt signaling has been implicated in regulating embryonic development, self-renewal of stem cells and cancer progression. Based upon these findings, we hypothesize that PTEN loss, resulting in high levels of phosphorylated Akt, leads to activation of canonical Wnt/β-catenin signaling in a subset of cells within BL2 breast cancers. We have taken a panel of PTEN-null, EGFR overexpressing TNBC cell lines (SUM-149, SUM-229, and MDA-MB-468) and overexpressed PTEN using a lentiviral overexpression vector. Over-expression of PTEN has led to differential levels of phosphorylated levels of Akt. Future studies will be aimed at characterizing the Wnt active cells within each cell line to determine if they are cancer initiating cell population.

151 WHSC1L1 and Estrogen-independent Activation of Estrogen Receptor-alpha in 8p11 Amplicon-bearing Cell Lines

, Jamie N Mills[1], Jon Irish[2], Brittany Turner-Ivey[1], Stephen Ethier[1]; *[1]Pathology, MUSC, [2]Wayne State University*.

The 8p11-p12 genomic region is amplified in breast and lung cancers and is associated with poorer prognosis. This genomic region harbors several oncogenes; three are epigenetic modifiers of chromatin (WHSC1L1, KAT6A, ASH2L). WHSC1L1 is a histone methyl-transferase expressed in 2 isoforms. We have shown that the short isoform is consistently more highly expressed than the long isoform. shRNA knockdown of WHSC1L1 resulted in reduced expression of several important genes, including CD44, HER4, and ESR1,

which encodes estrogen receptor alpha (ER-alpha). The SUM-44 cell line harbors the 8p11 amplicon and overexpresses WHSC1L1 and ER-alpha. Knockdown of WH-short in this line resulted in decreased ER-alpha expression. ER-alpha ChIP-seq in revealed that ER-alpha retains the ability to bind chromatin and participate in gene transcription in the absence of estrogen. Estrogen response elements and FOXA1 sites were identified as the most common binding motifs for ER-alpha, and RT-PCR following siRNA knockdown of ESR1 or FOXA1 demonstrated decreased transcription of a panel of genes bound by ER-alpha. Knockdown of WHSC1L1 abolished the ability of ER-alpha to bind chromatin without estrogen. Despite estrogen-independence, shRNA knockdown of ESR1 in this cell line demonstrated that these cells are dependent on ER-alpha for growth and survival. Similarly, treatment with Fulvestrant, a selective estrogen receptor degrader (SERD), resulted in downregulation of ER-alpha and growth inhibition in SUM-44 cells. Together, these results indicate that WHSC1L1 overexpression is associated with ER-alpha overexpression, leading to several downstream changes in gene expression dependent upon ER-alpha and FOXA1 but independent of estrogen signaling. Ongoing studies focus on identifying the alterations in gene expression due to WHSC1L1 directly as opposed to indirectly by its effects on ER-alpha. These mechanistic studies are essential to understanding the role of the 8p11 amplicon in ER+ breast cancer and how this genomic alteration can be exploited to improve patient outcomes. *Internal Funding*

152 Noise-induced Hearing Loss Is Mediated By the Activation of AMPK Signaling

Kayla Hill, Hu Yuan, Xianren Wang, Su-Hua Sha; *Pathology, MUSC*.

Abstract not available.

153 Phosphorylation Dynamics of PTH Receptor Signaling In Osteoblasts with Biased and Unbiased Agonists

Grace R Williams[1], Mary N Berkaw[1], Jennifer R Bethard[1], Louis M Luttrell[2], Lauren E Ball[1]; *[1]Pharmacology, [2]Medicine*.

The PTH1R is a key regulator of calcium homeostasis and bone remodeling. Human PTH1-34 (Forteo) is the only FDA approved drugs used for treatment of osteoporosis which acts via anabolic actions on osteoblasts (OB). A functionally-selective agonist of the PTH1R, PTH(7-34), stimulates the anabolic action without inciting the release of RANKL. Characterization of the phosphorylation-mediated signaling network engaged by the PTH1R will provide insight into osteoporotic treatment and the developing field of GPCR biased agonism. Studies are focused on dynamic phosphorylation events following acute stimulation with hPTH1-34 and bPTH(7-34). Ten-day cultures of differentiating SILAC-labeled murine MC3T3-E1 osteoblasts were stimulated ± hPTH(1-34) or bPTH(7-34) for 5 min (n=5 with 2 label swaps). Tryptic peptides were fractionated by SCX and phosphopeptides enriched by TiO2. Peptides were analyzed by nLC-CID or ETD MS/MS using a decision tree approach (Orbitrap Elite). The threshold for change in the extent of phosphorylation was set using the R-program Limma test with a p-value limit of 0.1. Downstream data analysis was performed using Perseus, NetworKIN, and Ingenuity Pathway Analysis. We identified 9,576 unique site-localized phosphopeptides and 294 phosphopeptides from 160 proteins including 15 kinases were regulated by 5 min stimulation with hPTH(1-34). Regulation of key mediators of the Wnt, IGF-1, BMP/TGF-β pathways was observed. Bioinformatic pathways analysis of the phosphoprotein datasets revealed that Gs, Gq/11 and G12/13 signaling; Rho, Rac and Cdc42 small G protein activation; cytoskeletal rearrangement, and cell motility were the dominant biological processes regulated by hPTH(1-34) after 5 min stimulation. On-going studies are evaluating the effect of a functionally selective agonist bPTH(7-34) on phosphorylation mediated signaling. This study revealed novel proteins and sites of phosphorylation involved in the response of osteoblasts to PTH. *NIH R01 DE020925; S10 D010731; R01 DK055524*

154 Improved Disease Burden Modeling Based on Administrative Healthcare Data

Ralph C Ward[1], Mulugeta Gebregziabher[1], Leonard Egede[2]; *[1]Public Health Sciences, MUSC, [2]HEROIC COIN, Ralph H. Johnson VAMC*.

Objectives: In order to mitigate the potential for bias, adjustment for disease burden or comorbidity is essential in statistical models of health outcomes research. Commonly used adjustment methods include Deyo-Charlson, Elixhauser or including selected diagnostic indicators of individual comorbidities. In this study, we develop a new summary measure of disease severity based on ICD-9-CM codes for use in predictive models, and compare its performance to existing indices. Methods: We propose a measure of disease severity developed by comparing machine learning and maximum likelihood approaches for dimension reduction in determining a latent comorbidity score. The operating characteristics of the proposed measure are examined using the receiver operating characteristics (ROC) and cross-validation techniques. Results: We applied this approach to retrospective data involving two large cohorts of Veterans, including 892,223 with diabetes, and 168,521 with a history of traumatic brain injury. We showed that improved risk adjustment over existing comorbidity indices can be achieved through a summary measure derived through the predictive modeling techniques demonstrated here. Conclusions: The proposed summary measure of disease severity leads to higher levels of risk adjustment. Instead of categorizing the count of diagnostic indicators from ICD-9 codes, the proposed measure provides for more robust adjustment for disease severity. Impact: Researchers should consider alternative methods to previously validated

comorbidity scores when adjusting for risk in outcomes research. Such gains in risk prediction modeling can have a wide applicability, including better predictions of patient outcomes or hospital re-admissions. *Veterans Affairs HSR&D CIN 13-410; Charleston Health Equity and Rural Outreach Innovation Center (COIN)*

155 Predicting Long-term Functional Outcome After Moderate to Severe Traumatic Brain Injury with Biomarkers: A Practical Tool, Liqiong Fan[1], Bethany J Wolf[1], Michael Frankel[2], David W Wright[3], Sharon D Yeatts[1]; *[1]Public Health Sciences, MUSC, [2]Neurology, Emory, [3]Emergency Medicine, Emory*.

Background: Traumatic brain injury (TBI) is a leading cause of emergency room visits, hospitalizations and death worldwide. In the acute evaluation of a TBI patient, drug and/or alcohol use is common and confound the assessment of brain injury severity and subsequently, long term prognosis. ProTECT was a randomized phase III clinical trial evaluating intravenous progesterone started within 4 hours of TBI. Bio-ProTECT, an ancillary biomarker study, was designed to evaluate the association of four promising biomarkers with functional recovery assessed via the Extended Glasgow Outcome Scale (GOS-E) at six months. Objective: To develop a predictive model for long-term functional outcome using Bio-ProTECT data. Methods: Biomarkers (S100B, GFAP, UCH-L1 and SBDP150) were collected within 4 hours of randomization. Additional prognostic variables included age, gender, injury severity defined via the Glasgow Coma Scale (GCS), and the Rotterdam CT score. Logistic regression, classification and regression trees and ensemble tree approaches were considered for model development. A split sample approach was adopted to identify the best prediction model using 100 bootstrapping samples generated from the original data. The average area under the ROC curve (AUC) was used to assess model performance. A web app was created through the R package shiny to increase the clinical utility of the model. Results: Logistic regression outperformed the other approaches. The final prediction model includes S100B, GFAP, age, gender, GCS and Rotterdam. The average AUC is 0.85 with sensitivity 0.69 and specificity 0.84. The average AUC of a model without biomarkers decreases to 0.81. Conclusion: The prognostic model can reasonably predict the long-term functional outcome following TBI. Prognostic ability is improved when the biomarkers S100B and GFAP are added to a model which includes only the clinical variables. *NETT; U01NS059041*

156 Engineering Alginate As Bioink for Bioprinting, Jia Jia, Dylan J Richards, Richard P Visconti, Thomas C Trusk, Michael J Yost, Hai Yao, Roger R Markwald, Ying Mei; *Regenerative Medicine and Cell Biology, MUSC*.

Recent advances in three-dimensional (3-D) printing offer an excellent opportunity to address critical challenges faced by current tissue engineering approaches. Alginate hydrogels have been used extensively as bioinks for 3-D bioprinting. However, most previous research has focused on native alginates with limited degradation. The application of oxidized alginates with controlled degradation in bioprinting has not been explored. Here, a collection of 30 different alginate hydrogels with varied oxidation percentages and concentrations was prepared to develop a bioink platform that can be applied to a multitude of tissue engineering applications. The authors systematically investigated the effects of two key material properties (i.e. viscosity and density) of alginate solutions on their printabilities to identify a suitable range of material properties of alginates to be applied to bioprinting. Further, four alginate solutions with varied biodegradability were printed with human adipose-derived stem cells (hADSCs) into lattice-structured, cell-laden hydrogels with high accuracy. Notably, these alginate-based bioinks were shown to be capable of modulating proliferation and spreading of hADSCs without affecting the structure integrity of the lattice structures (except the highly degradable one) after 8 days in culture. This research lays a foundation for the development of alginate-based bioink for tissue-specific tissue engineering applications. *NSF EPS-0903795; Clemson Univ; NIH P20 GM103444*

157 Silicon Nanowires Induced Maturation of Cardiomyocytes Derived From Human Induced Pluripotent Stem Cells, Yu Tan[1], Dylan Richards[1], Donald R Menick[2], Bozhi Tian[3], Ying Mei[1]; *[1]Bioengineering, Clemson, [2]Cardiology, MUSC, [3]Chemistry, University of Chicago*.

The current inability to derive mature cardiomyocytes from human pluripotent stem cells has been the limiting step for transitioning this powerful technology into clinical therapies. To address this, scaffold-based tissue engineering approaches have been utilized to mimic heart development in vitro and promote maturation of cardiomyocytes derived from human pluripotent stem cells. While scaffolds can provide 3D microenvironments, current scaffolds lack the matched physical/chemical/biological properties of native extracellular environments. On the other hand, scaffold-free, 3D cardiac spheroids (i.e., spherical-shaped microtissues) prepared by seeding cardiomyocytes into agarose microwells were shown to improve cardiac functions. However, cardiomyocytes within the spheroids could not assemble in a controlled manner and led to compromised, unsynchronized contractions. Here, we show, for the first time, that incorporation of a trace amount (i.e., approximately 0.004% w/v) of electrically conductive silicon nanowires (e-SiNWs) in otherwise scaffold-free cardiac spheroids can form an electrically conductive network, leading to synchronized and significantly enhanced contraction (i.e., >55% increase in average contraction amplitude), resulting in

significantly more advanced cellular structural and contractile maturation. *NIH 8P20 GM103444; U54 GM104941; HL 085847; R01 HL095696, R01 HL094545; Clemson Univ; NSF EPS 0903795; NIH T32 HL007260; VA BX002327*

158 Facilitators and Barriers to Lung Cancer Screening Among Veterans

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Introduction: The United States Preventive Services Task Force recommends annual low dose computed tomography (LDCT) screening for high-risk individuals. Compared to the general population, Veterans have a 76% higher age-specific incidence of lung cancer and lower survival rates. Limited information exists about factors influencing lung cancer screening among Veterans. We explored perceived facilitators and barriers to receiving lung cancer screening among Veterans at the Charleston VAMC, one of eight Lung Cancer Screening Demonstration Project sites in the country. Methods: We conducted an exploratory qualitative study using grounded theory with 28 Veterans (6 focus groups) meeting criteria for lung cancer screening. All participants completed a survey before the focus group. Interview guides included questions about their perceptions of risk factors for lung cancer, pre-screening discussions had with primary care providers, the subsequent process of undergoing LDCT, and suggestions to aid decision-making related to screening. Focus group sessions were recorded, transcribed verbatim and analyzed with NVivo 10. Results: Most Veterans identified smoking as a risk factor for lung cancer. They were concerned about additional factors, such as asbestos, environmental exposures, and family history. They also identified other diseases in addition to cancer risk as reasons to stop smoking. Most participants had limited discussions related to the pros and cons of screening with their primary care providers, but still choose to undergo LDCT. Screening convenience (64.3%) and test accuracy (82.1%) were of highest interest to the participants. They believed that access to informational brochures and videos and use of risk prediction models could further enhance decision-making around screening. Conclusions: Veterans identify smoking as a personal risk factor for lung cancer and are willing to participate in LDCT screening. Interventions at both the systems and patient level are required to improve Veterans' understanding of test benefits and limitations and shared decision-making with healthcare teams. *Health Equity and Rural Outreach Innovation Center (HEROIC), Ralph H. Johnson VAMC*

159 Ceramide is A Key Factor That Regulates The Crosstalk Between TGF-β and Sonic Hedhehog Signaling At The Basal Cilia To Control Cell Migration and Tumor Metastasis

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Recent studies show that ceramide species with different fatty-acid chain lengths play diverse biological functions in various cellular processes, highlighting the importance of ceramide synthases (CerS) in these processes. Migration and cell mobility, a part of these processes, also are effected by ceramide metabolism. However, the molecular mechanism of CerS/and ceramide involved is unknown. Here, we investigated the effect of CerS/and ceramide on migration and its related signal pathways in situ and in vivo model. Interestingly, our data show that among CerS only CerS4/ceramide is involved to cell migration and tumor metastasis. Here, we also have generated CerS4-/- mice for in vivo studies. Interestingly, we observed that genetically loss of CerS4 resulted in irreversible alopecia, which was associated with hyper-proliferation and migration of keratinocytes. Mechanistically, we show here that genetic loss or shRNA-mediated knockdown of CerS4 enhances cell migration by which ligand-independent signaling of TGF-β receptors I and II in various cell types, including keratinocytes, mouse embryonic fibroblasts and cancer cells. Moreover, we found that ceramide directly interact with Smad7 and this interaction was decreased by shRNA-mediated knockdown of CerS4. Thus, ceramide-Smad7 binding modulates plasma membrane association of TGF-βR1 at primary basal cilia, and inhibits its signaling through Sonic-hedgehog (Shh) for migration. Furthermore, Ceramide accumulation into the primary basal cilia was decreased by knockdown of CerS4, and this was associated with direct interaction of TGF-βR1 and SMO receptors in cilia. In fact, inhibition of TGF- βR/Shh signaling or cilia formation using molecular or pharmacologic inhibitors almost completely prevented cell migration in response to CerS4 knockdown. These data revealed that CerS4/ceramide signaling plays key roles in the regulation of cell migration and metastasis via controlling the TGF-βR and Shh axis at primary basal cilia. *NIH R01 DE016572*

160 Discovery of a Novel Alanine-substituted Cyclic Peptide That Acts As a Potent Inhibitor of Lysine-specific Demethylase 1 (LSD1)

, Isuru R Kumarasinghe, Patrick M Woster; *Drug Discovery and Biomedical Sciences, MUSC*.

Discovery of a novel alanine-substituted cyclic peptide that acts as a potent inhibitor of lysine-specific demethylase 1 (LSD1) Isuru R. Kumarasinghe and

Patrick M Woster Department of Drug Discovery and Biomedical Sciences, Medical University of South Carolina, 70 President Street, Charleston, South Carolina 29425, United States The enzyme lysine specific demethylase-1 (LSD1) is a chromatin remodeling enzyme that is a validated drug target for the anticancer drug discovery. Recent literature indicates that LSD1 is overexpressed in many tumor types, where it demethylates the activating chromatin mark histone 3 lysine 4 (H3K4me2) and promotes silencing of tumor suppressor genes important in human cancer. As such, inhibition of LSD1 is a rational strategy for antitumor therapy. We and others have developed multiple series of LSD1 inhibitors that increase H3K4me2 and promote re-expression of tumor suppressor proteins in vitro. These compounds significantly limit tumor growth in combination with 5-azacytidine in murine xenograft models. We previously described a cyclic peptide, c[Lys5, Glu10] [Met]4 H3K4 (1-21)-NH2, 7, which acts as a potent inhibitor of human recombinant LSD1/CoREST in vitro (IC50 2.1 μM; Ki 385 nM). However, it is not known which amino acid residues in this lead peptide are pharmacophoric are non-pharmacophoric. In the present study, each amino acid of the lead peptide, c[Lys5, Glu10] [Met]4 H3K4 (1-21)-NH2 was sequentially substituted with an alanine residue, and the resulting peptides were evaluated for LSD1 inhibition using the recombinant LSD1/CoREST assay. The results indicate that two of the resulting alanine-substituted cyclic peptides produce potent LSD1 inhibition {peptide 9: c[Lys5, Glu10] [Met]4 [Ala]3 H3K4(1-21)-NH2 IC50 = 136 nM and peptide 14: c[Lys5, Glu10] [Met]4 [Ala]11 H3K4(1-21)-NH2 IC50 = 107 nM}. Structural superimposition of alanine substituted peptides 9 and 14 with the previously reported cyclic peptide 7 revealed that 9 and 14 assume similar backbone and side chain conformations to 7. In this presentation, the synthesis and biological evaluation of cyclic alanine-substituted peptides and new derivatives related to 7 will be described. *NIH R01 CA149095*

161 Hypersensitive Esophagus: The Truth, The Myth, And The Reality

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Aim To investigate the clinical effectiveness of PPI therapy in patients with refractory “reflux” symptoms. Background The role of acid in producing gastroesophageal reflux symptoms and esophageal mucosal injury is well established. However, some patients still experience reflux-like symptoms despite having achieved normal esophageal acid exposure on PPI therapy. A hypersensitive esophagus (HE) has been traditionally defined to have a lower threshold for perception of symptoms. The triggers of these symptoms could be mechanical, chemical, emotional, or combinations, which implies the underlying etiology is still unknown. The criteria of hypersensitive esophagus on reflux testing are normal esophageal acid exposure and positive symptom association. Methods We analyzed 24 hr pH-impedance data for the duration of different esophageal pH levels in patients who met the criteria of hypersensitive esophagus. We compared three groups; 36 patients OFF PPI therapy and 49 patients ON therapy were first studied. Since the esophageal acid exposure may not be an accurate measure of reflux in those ON PPI, a third group of 49 patients with normal esophageal acid exposure, positive symptoms association and high number of reflux episodes (> 48) on impedance was studied. The 24 hr pH-impedance study was analyzed for duration of esophageal acid in minutes at pH range (< 1, 1-2,2-3,3-4,4-5,5-6,6-7 and > 7) Results The first two groups showed no significant difference (t-test; p = 0.99) in the durations of different esophageal pH levels. Also no difference was found (X2; p = 0.6) for time < 4 pH > 4. Finally, no significant difference (ANOVA; p = 0.99) in durations pf pH levels for all groups. Conclusion The results of this study raise several questions about “hypersensitive esophagus”. What are the validity and clinical implications of this term? Is it wise to use PPI therapy in these patients? Is measuring symptom association a useful criterion in interpreting esophageal reflux studies?

162 Examining the Feasibility of an In-Home Stroke Rehabilitation Computer Game Designed to Promote Repetitive Arm Practice for Individuals with Chronic Hemiparesis

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Introduction: High repetition, challenging movement practice is critical to promote motor recovery post-stroke. However, many therapy programs do not provide these optimal practice conditions and individuals have limited access to therapist-supervised programs. Home exercise programs (HEP) are often provided, but adherence is low. New self-directed programs that are motivating and enable arm practice are needed. An interactive computer game called Duck Duck Punch (DDP) may offer an innovative alternative for individuals to engage in high repetition arm practice. Methods: We conducted a randomized controlled trial comparing two self-directed 7 day in-home repetitive arm movement programs: DDP vs. HEP. Feasibility (DDP usability, pain/fatigue), adherence to self-directed activity (number of minutes/sessions measured by accelerometer), and paretic arm use (Arm Activity Ratio (AAR) comparing paretic to non-paretic) were examined. Descriptive analyses were conducted for feasibility and Mann-Whitney U tests were performed to compare adherence and arm use between groups. Results: Twenty participants (10 per group; moderate-severe paresis) were enrolled. Six participants reported 35 problems using DDP which were resolved. Four DDP participants reported pain (7 occurrences) and 3 HEP participants reported pain (6 occurrences). Fatigue was reported by

6 DDP participants (10 occurrences) and 1 HEP participant (1 occurrence). Subjects demonstrated greater adherence to DDP than the HEP (DDP: median of 7/7 days; HEP: median of 5/7 days). DDP subjects spent significantly (p=0.01) more time (median=431.0 minutes) engaged than HEP subjects (median=162.5 minutes). The AAR ratios indicated that DDP subjects used their paretic arm more than their non-paretic arm compared to HEP subjects (Median AAR: DDP, 2.69; HEP,1.89) but this difference was not statistically significant (p=0.06). Conclusion: DDP is feasible for home use and individuals spent more time practicing arm movements using DDP than HEP. These data suggest that DDP promotes unilateral repetitive motions (paretic arm), while the HEP elicited bilateral repetitive motions. *NIH/NGMS IDEA De-Accel CTR U54GM1049-01, MUSC Pilot Project Award*

163 Resilience and Psychological Distress Among Surrogate Decision Makers of Critically Ill Patients

Nadig Nandita[1], Huff Nidhi[2], Cox Christopher[2], Ford Dee[1]; *[1]MUSC, [2]Duke*.

Rationale: Previous research has emphasized the negative consequences from stress. However, resilience is the ability to undergo a traumatic event without suffering post-traumatic stress. Understanding surrogate resilience and its relationship to symptoms of psychological distress, could provide better insight to the mental health of patient surrogates. Our aim was to determine the relationship between resilience, post-traumatic stress, anxiety and depression for surrogates in the ICU. Methods: We undertook a consecutive, cross-sectional survey analysis of all surrogate decision makers of mechanically ventilated patients discharging from all ICU's at Duke University and MUSC. The study included 59 surrogates. Resilience and patient-centered care were measured using the Conner-Davidson Resilience Scale (CDRS) and the Patient Centeredness of Care Scale (PCCS), respectively. Post-traumatic stress, anxiety and depression were measured using the Post-Traumatic Stress Scale (PTSS) and the Hospital Anxiety and Depression Scale (HADS). Results: On analysis, our study population was primarily female (76%); 41% were African-American. The relationship of the surrogate to patients included spouses (31%), children (33%), or parents (17%). Mean (SD) scores for study questionnaires were CDRS 41 (SD 6), PCCS 41 (SD 6), HADS 28 (9), and PTSS 24 (11). CDRS scores correlated well with HADS (-0.41, p=0.003), though weakly with PCCS (0.13, p=0.38) and PTSS (-0.20, p=0.17). PCCS showed a moderate correlation with the HADS (-0.27, p=0.06) though a weak correlation with the PTSS (-0.13, p=0.39). Conclusions: In this exploratory study, we found that psychological distress was moderately severe among surrogates in the hospital after an ICU admission. A low level of resilience correlated strongly with depression and anxiety but not with post-traumatic stress. These early findings suggest that specific intrinsic personality traits may help to identify those at high risk for persistent distress and an eventual subgroup analysis could help identify surrogate characteristics that are important in predicting mental health and coping strategies.

164 Kallistatin Induces Breast Cancer Cell Apoptosis and Autophagy By Modulating Wnt Signaling and MicroRNA Synthesis

Pengfei Li, Youming Guo, Bledsoe Grant, Zhirong Yang, Lee Chao, Julie Chao; *Biochemistry and Molecular Biology, MUSC*.

Kallistatin is an endogenous protein that regulates differential signaling pathways and biological functions. Our previous studies showed that kallistatin gene therapy inhibited angiogenesis, tumor growth and metastasis in mice, and kallistatin protein suppressed Wnt-mediated growth, migration and invasion by blocking Wnt/beta-catenin signaling pathway in breast cancer cells. In this study, we showed that kallistatin reduced the viability, and increased apoptotic cell death and caspase-3 activity in MDA-MB-231 breast cancer cells. Kallistatin also induced cancer cell autophagy, as evidenced by increased LC3B levels and elevated Atg5 and Beclin-1 expression, however, addition of Wnt3a abolished these effects. Moreover, kallistatin via its heparin-binding domain antagonized Wnt3a-induced cancer cell proliferation. Kallistatin inhibited oncogenic miR-21 synthesis associated with reduced Akt phosphoration and Bcl-2 synthesis, but increased BAX expression. Kallistatin via PKC-ERK activation reduced miR-203 levels, leading to increased expression of suppressor of cytokine signaling 3 (SOCS3), a tumor suppressor. Conversely, kallistatin stimulated tumorigenic suppressor miR-34a and p53 expression. Kallistatin's active site is essential for suppressing miR-21 and miR-203, and stimulating miR-34a and SOCS3 expression. This is the first study to demonstrate that kallistatin's heparin-binding site is essential for inhibiting Wnt-mediated effect, and its active site plays a key role in regulating miR-21, miR-203, miR-34a and SOCS3 synthesis in breast cancer cells. These findings reveal novel mechanisms of kallistatin in inducing apoptosis and autophagy in breast cancer cells, thus inhibiting tumor progression by regulation of Wnt signaling, as well as miR-21, miR-203 and miR-34a synthesis. *NIH HL118516*

165 Effect of HIV Infection on Alpha-1 Antitrypsin Function: Role in Emphysema?

Sarah E Stephenson, Carole L Wilson, Kristina Crothers, Irina Petrache, Lynn M Schnapp; *Medicine, MUSC*.

Pulmonary complications are one of the leading risk factors of mortality in the HIV-positive individuals. Of these complications, emphysema, which is characterized by irreversible destruction of the alveolar tissue, is evident in approximately 20% of the HIV-positive patients. The pathogenesis of HIV-induced pulmonary emphysema remains unclear; however, pathological

changes within the lungs of HIV positive patients are similar to emphysema patients with a genetic deficiency in alpha-1 antitrypsin (A1AT), a key elastase inhibitor in the lung. HIV-positive patients reportedly have reduced levels of circulating A1AT, suggesting that lack of this inhibitor contributes to emphysema development in this patient population. To investigate the functional role of A1AT in relationship to HIV infection, we analyzed plasma and bronchoalveolar lavage fluid from a cohort of HIV-positive and-negative patients with normal and reduced lung function (defined by DLCO). ELISAs were used to measure circulating and local A1AT levels in the plasma and bronchoalveolar lavage (BAL) fluid of patients, respectively. In addition, potential modifications in A1AT were assessed by western blot analysis and functional assays. In contrast to our hypothesis, we found that total A1AT is increased in the BAL of HIV-positive patients, compared to HIV-negative patients, regardless of lung function status. However, we detected decreased anti-elastase activity in HIV+ patients, suggesting impaired A1AT function. We detected modifications of A1AT, including the polymerized and oxidized form, in HIV+ patients, which may account for decreased A1AT anti-elastase activity. These findings suggest that in the lungs of HIV positive patients, conformational changes in alpha-1 antitrypsin produce a "functional deficiency" in this critical elastase inhibitor, which may contribute to emphysema development.

166 FLI1 Levels Impact CXCR3 Expression and Renal Infiltration of T Cells and Renal Glycosphingolipid Metabolism in the MRL/lpr Lupus Mouse Strain

, Kamala Sundararaj, Thirumagal Thiyagarajan, Ivan Molano, Fahmin Basher, Thomas Powers, Richard Drake, Tamara Nowling; *MUSC*.

The Ets factor FLI1 is a key modulator of lupus disease expression. Over-expressing FLI1 in healthy mice, results in the development of an autoimmune kidney disease similar to that observed in lupus. Lowering the global levels of FLI1 in two lupus strains significantly improved kidney disease and prolonged survival. Lowering the global levels of FLI1 in MRL/lpr lupus mice (Fli1+/-) reduced activation and IL-4 production, Neuraminidase1 (Neu1) expression, and the levels of the glycosphingolipid (GSL) lactosylceramide (LacCer) in T cells. Here we demonstrate that MRL/lpr Fli1+/- mice have significantly decreased renal Neu1 and LacCer levels, which are significantly elevated in lupus mice and human patients with nephritis. This corresponds with a significant decrease in the number of total CD3+ cells, as well as CD4+ and CD44+CD62L- T cell subsets in the kidney of MRL/lpr Fli1+/- mice compared to the Fli1+/+ nephritic mice. We further demonstrate that the percentage of CXCR3+ T cells and CXCR3 message levels in T cells are significantly decreased and corresponds with a decrease in renal CXCR3+ cells in the MRL/lpr Fli1+/- compared to the Fli1+/+ nephritic mice. Results of an adoptive transfer experiment demonstrate that T cell intrinsic levels of FLI1 are important in renal infiltration. Together, our data demonstrate that down-regulation of CXCR3 due to reduced levels of FLI1 in MRL/lpr mice may be protective against development of nephritis by reducing renal T cell infiltration and GSL metabolism. *VA BX000115; NIH AR053376; NCI R01 CA135087; DOD W81XWH-10-1-0136; Lipidomics Shared Resource*

167 The Effect of Dietary Heptadenoic Acid Enrichment on Adiponectin Multimerization and Serum Levels in Bottlenose Dolphins with Metabolic Syndrome

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Introduction: Adiponectin is an insulin sensitizing adipokine secreted primarily as trimers, hexamers, and high molecular weight (HMW) oligomers. Reduced circulating levels of the HMW form have been associated with hyperinsulinemia and obesity. Mutagenic studies demonstrated that hydroxylation and glycosylation of lysine residues is important in the assembly and secretion of HMW adiponectin. Our laboratory has previously demonstrated bottlenose dolphins with hemochromatosis had an elevation in the proportion of adiponectin lacking glycosylated Lys-75 (%unmodified) compared to controls. We hypothesized that the amount of %unmodified adiponectin measured via parallel reaction monitoring mass spectrometry (PRM-MS) is a proxy for HMW adiponectin, and that the %unmodified adiponectin will decrease appropriately in dolphins with metabolic syndrome that have been fed a diet rich in heptadenoic acid which has been reported to reduce serum factors indicative of metabolic syndrome. Methods: Depleted dolphin serum was separated on NativePAGE™ gels and lysine modifications were detected by LC/MS/MS. Total and %unmodified adiponectin was measured using PRM-MS. Results: Densitometry of NativePAGE™ Western blots demonstrated a shift from HMW adiponectin to lower molecular weight oligomers over the 24-week study. Total adiponectin was significantly ($P<0.01$) elevated in study dolphins at weeks 12, 18, and 24 versus time 0 (mean pmols/mL±s.d.): 0-weeks, 776±401; 3-weeks, 937±531; 6-weeks, 806±382; 12-weeks, 1147±477; 18-weeks, 1189±640; 24-weeks 1196±467. Mean %unmodified (±s.d.) adiponectin was reduced ($P<0.03$) at all collection intervals versus control: 0-weeks, 23.8±6.0; 3-weeks, 18.9±6.0; 6-weeks, 18.4±5.8; 12-weeks, 18.0±3.9; 18-weeks, 16.0±4.2; 24-weeks, 15.2±5.3. The %unmodified adiponectin values were positively correlated with insulin ($\rho=0.425$, $p=0.01$) and ferritin ($\rho=0.422$, $p=0.01$) whereas total adiponectin was inversely correlated with iron ($\rho=-0.433$, $p=0.01$) and ferritin ($\rho=-0.425$, $p=0.01$). Conclusion: The data suggest that the %unmodified is correlated with increased HMW and that a diet rich in heptadenoic acid led to an

increase in serum total adiponectin and reduction in %unmodified adiponectin 2h postprandial. *DoD/ONR N000141410361*

168 Live-Cell Imaging of the Bystander Effect in Retinal Pigment Epithelial Cell Monolayers

Masaaki Ishii, Bärbel Rohrer; *Ophthalmology, MUSC*.

Purpose: The “bystander effect” in biology refers to the phenomenon of induction of biological effects in cells not directly targeted, and may be caused by intercellular communication via gap junctions (GJ). The “dry” type of Age Related Macular Degeneration (dAMD) is associated with formation of drusen under the macular Retinal Pigment Epithelium (RPE) cells. Interestingly, drusen, followed by geographic atrophy occurs focally in many patches. However, the cellular signaling pathway(s) involved in this non-uniform spreading of information is unknown. Thus we investigated the phenomenon of the bystander effect of ROS and Calcium spreading in RPE cell as a dAMD model. Methods: ARPE-19 cells were cultured for 14 days on glass-bottom culture dishes to establish well-connected monolayers. Fluorescent dyes CellRox Green (CRG) and CellRox Orange to detect ROS and Fluo8 AM to indicate calcium were used. For data acquisition and photo-stimulation, the UltraView Vox live imaging system controlled through Volocity software (Perkin Elmer) was used. Imaging data was analyzed using Igor Pro (Wave Metrics). Results: Oxidative stress was initiated in a single cell using stimulation with a 488 nm laser spot on cytosolic area at 1 Hz. Within minutes, in some but not all neighboring cells the CRG signal was increased. This change was further spread to additional select cells surrounding the secondary cells. Interestingly, the GJ blocker prevented the spreading of the Fluo8 response but not the CRG and CRO signal. Conclusions: These results demonstrate that local oxidative stress in a donor cell can trigger the spread of information leading to changes in mitochondrial homeostasis and ROS production in a limited number of connected recipient cells. Changes in mitochondrial homeostasis were dependent upon the transfer of a calcium signal via GJs, whereas the spreading of the ROS signal occurred both through GJs as well as across the plasma membrane. *NIH/NEI R01 EY019320*

169 Systemic Response of IL-17 Following Choroidal Neovascularization in a Mouse Model for Age-Related Macular Degeneration

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Abstract not available.

170 Thyroid Hormone Exposure Drives SFRP4 Overexpression and WNT Antagonism in Calvarial Suture Cells

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Introduction: Perturbation in thyroid hormone levels can disrupt growth and development pre and postnatally. Recent data has linked exposure of exogenous thyroid hormone (thyroid replacement drugs) to birth defects of the craniofacial skeleton. Here we test the hypothesis that exogenous thyroid exposure increases expression of osteogenic genes and IGF1 in cells derived from the sites of cranial growth, the cranial sutures. Materials and Methods: We isolated cells from the coronal suture of 4 litters separated by sex to result in an N=8 cell populations and exposed the cells to exogenous thyroxine hormone in culture. Bioassays were conducted for cell proliferation and differentiation, RNA isolated for genome wide expression array and confirmatory gene expression experimentation, and protein isolated for Western Blot. Results: Results suggest increases in proliferation and differentiation (ALP activity) overtime in culture, but no difference by thyroxine exposure. Thyroxine exposure was observed to drive increased expression of two Secreted Frizzled Related Proteins (SFRP1, 40% increase; SFRP4, 400%) which are known WNT antagonsists. There was a slight increase observed in HTRA1 after 7 days of thyroxine exposure, but no changes to IGF1 expression. WNT antagonism was confirmed as Lef1 and TCF, canonical WNT targets, were observed to be downregulated after 3 days of thyroxine exposure. Discussion/Conclusions: Results suggests thyroxine exposure drives WNT antagonism of cells garnered from the growth sites of the cranium. Although HTRA1 was overexpressed after 7 days of thyroxine exposure no concomitant increase in IGF1 expression was observed. We postulate this is due to the heterogeneous mix of cells isolated from the cranial sutures (mesenchymal stem cells, fibroblasts, pre-osteoblasts, and osteoblasts). Although WNT antagonism is generally associated with negative bone phenotypes, SFRP4 is known to have other functions specifically as a marker of stem cell differentiation. Future research will focus cell specific effects of thyroid hormone exposure. *NIH/NIDCR RDE023350A, NIH/NCATS UL1 TR000062, NIH/NIGM P30 GM103331, and SMART award*

171 Tristetraprolin is Required for Alveolar Bone Homeostasis

Heidi M Steinkamp, Mary Gray, Hong Yu, Keith L Kirkwood; *Oral Health Sciences, MUSC*.

Abstract not available.

172 Time-Driven Activity-Based Cost Accounting for Total Hip Arthroplasty At a Large University Academic Medical Center,

John Palsis[1], Jacob Drew[1], Gayle Wadford[1], Thomas Brehmer[2], Shana Dykema[3], Kathleen Plummer[1], Brian Whittsit[4], Barton Sachs[1]; *[1]Orthopaedics, MUSC, [2]Health Professions, MUSC, [3]Performance Improvement, MUSC, [4]Business Management, MUSC*.

Unsustainable healthcare expenditures in the United States have forced providers and organizations to increase value, or to deliver higher quality care at a lower cost. To accomplish this aim, we must first understand our true costs. Economists introduced time-driven activity-based costing (TDABC) as a methodology to determine patient-level costs as traditional accounting lacks this micro-costing approach. We applied time-driven activity-based costing (TDABC) at our university academic medical center to estimate the cost for the primary total hip arthroplasty (THA) care cycle (i.e., from the day surgery was scheduled to 90 days post-surgery). We then compared the results to the traditional accounting methodology used at our institution. The total cost per case using traditional accounting compared to the TDABC method was $22,077 versus $12,443, respectively. Our results suggest that traditional accounting overestimates the personnel costs associated with THA by $3,600, space and equipment costs by $3,400, and indirect costs by $2,400 per patient. These substantial cost differences highlight TDABC's focus on only resources used directly by the patient while traditional accounting allocates all operating costs, including all indirect costs and unused capacity. Our aim is to increase value by reducing cost of THA while maintaining or improving patient outcomes. Recently, we have implemented new vendor contracts that reduce our cost of THA implants by 24%-45% depending on implant type, and we continue to redesign the care pathway to improve process efficiencies to further enhance our value of care.

173 Personal Economic Impact of Performing Elective Saturday Hand Surgery, Jonathan S Katz[1], Dil Patel[2], Ann Peterson[1], Eric Angermeier[1], Kyle Kokko[1]; *[1]Orthopaedics, MUSC, [2]SOM, MUSC*.

Introduction: To date, the economic impact of performing elective hand surgery on Saturdays has yet to be studied. The purpose of this study was to evaluate patient preferences and factors for them electing to undergo Saturday hand surgery. In addition, we sought to analyze the personal economic and societal costs regarding missed days of work or paid leave for elective hand surgery. Methods: An anonymous quality improvement questionnaire was distributed to 125 patients seen at our institution in our outpatient clinics who were planning to undergo outpatient elective hand surgery. Demographics included age, gender, zip code, education level, occupation, income level, and interest in Saturday hand surgery were collected. IBM-SPSS Statistics 20 for Windows (SPSS, Chicago, IL) was used for data analysis. Categorical and dichotomous variables were analyzed with chi square. Independent t-tests were used to compare continuous variables. Results: Forty-five males and eighty females answered the questionnaire. Seventy-eight (62.4%) of patients responded they would want to participate in elective Saturday hand surgery. Of those who reported income (n=66), the average daily salary of these patients was estimated to be $269.50. If these patients had been given the opportunity to have Saturday hand surgery, a total of $17,787.48 in lost income or paid leave would have been saved. We did not identify any significant factors (age, gender, education, job type, income, and distance from medical center) that correlated to patient's decision to undergo elective Saturday hand surgery. Discussion and Conclusion: Over half (62.4%) of our respondents would request Saturday elective hand surgery. Patients with higher earning potential were not more likely to elect for Saturday hand surgery. If 62.4% of operative hand surgery patients at our institution were to elect for Saturday surgery, we estimated a savings of over $100,000 in lost wages or paid leave annually. If extrapolated to a national scale, the savings potential for patients could total in the hundreds of millions.

174 Effect of External Beam Irradiation on the Pathway of Bone Fracture Healing, Yongren Wu[1], Evan L Hanna[1], William R Barfield[1], Zilan Lin[1], Daniel G McDonald[2], Kenneth N Vanek[2], Hai Yao[3], Vincent D Pellegrini, Jr[1]; *[1]Orthopaedics, MUSC, [2]Radiation Oncology, MUSC, [3]Clemson-MUSC Bioengineering*.

Abstract not available.

175 Elucidating the Genomic Response to Cochlear Lateral Wall Injury in Adult Mice, Robert G Keller[1], Mary Bridges[2], Michael Moore[1], Yazhi Xing[2], Jeremy Barth[3], Judith Dubno[1], Hainan Lang[2]; *[1]Otolaryngology, MUSC, [2]Pathology and Lab Medicine, MUSC, [3]Bioinformatics, MUSC*.

BACKGROUND: Age related hearing loss (presbyacusis) is a highly prevalent condition in adult humans. Degeneration of the cochlear lateral wall (CLW) is a key feature of presbyacusis and may be linked to diminished regenerative capacity of specialized non-sensory cells within the CLW over time. MicroRNAs (miRNAs) are important regulators of cellular proliferation in various tissues. We hypothesize that miRNAs regulate cellular recovery and proliferation in the CLW after ototoxic injury, ultimately facilitating its structural and functional restoration. METHODS: Using a surgical approach, mice were subjected to round window application of heptanol, a gap- junction inhibitor that provides a specific ototoxic insult to the CLW. CLWs were subsequently harvested on post-operative days

(POD)-3 and 7, and processed for mRNA and miRNA microarray analysis. RNAs differentially expressed between heptanol-treated mice and non-treated controls were analyzed using Ingenuity Pathway Analysis software to identify mRNA targets, highest-ranking pathways and interaction networks. RESULTS: Heptanol exposure resulted in differential expression of 63 miRNAs and 960 mRNAs at POD3. Nine of the miRNAs had putative mRNA targets that significantly changed with heptanol (65 total targets). Cellular growth and proliferation ranked as a top molecular function category to which 350 of the 960 mRNAs mapped, including 28 of the predicted targets. Initial validation analysis confirmed upregulation of two high-ranked candidates, mir-216a and mir-155. Both of these candidates are known to regulate cell proliferation and both had multiple predicted mRNA targets that changed significantly and belonged to cellular proliferation networks. At POD7, 39 miRNAs and 225 mRNAs were differentially expressed. Five miRNAs had putative mRNA targets with demonstrated expression change (22 total targets); 101 of the 225 mRNAs are linked to cellular growth and proliferation. CONCLUSIONS: Numerous miRNAs and their putative mRNA targets are differentially expressed following acute CLW damage. These molecules are linked to cellular function recovery and proliferation. *NIH R01 DC012058, P50 DC00422, P30 GM103342, and P20 GM103499*

176 Clinical Test Performance of Human Cochlear Reflectance Measurements

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The total sound pressure measured in the ear canal is composed of forward and reverse propagating components. Most of the reverse propagating component is due to reflection at the eardrum. However, a measurable contribution comes from the cochlea. Otoacoustic emissions (OAEs) are associated with this component and are an important noninvasive measure of cochlear function. Total ear-canal reflectance (ECR) is the transfer function between forward and reverse propagating components measured in the ear canal, and cochlear reflectance (CR) is the inner-ear contribution to the total ECR. Advantages of CR over current OAE measurements are accounting for characteristics of the stimulus-delivery system to a greater extent, and wider bandwidth (0.14 to 16 kHz). The purposes of this study were to (1) assess the reliability of CR across repeated measurements and (2) determine CR stimulus conditions providing the best clinical test performance. CR measurements were made in 22 normal-hearing and 37 hearing-impaired adults. Data were collected at seven levels (10 – 70 dB SPL, 10-dB steps) using a wideband noise. CR measurement reliability was evaluated by comparing repeated measurements of CR magnitude (CRM). Within-subject correlations between the two best measurements (from three) ranged from 0.78 to 0.94, with higher correlations at mid–frequencies (1– 3 kHz) and mid-levels (30 – 50 dB SPL). The mean absolute difference across level and frequency between the two best test runs for all subjects was 1.1 dB, with few outliers. Test performance was best for frequencies >1 kHz and at mid-levels (levels of 30 – 50 dB SPL), and was correlated with signal-to-noise ratio (SNR). Areas under the receiver operating characteristic (AROC) curve were smaller for CR compared to previously reported AROC for distortion-product OAEs, but the clinical utility of CR may be improved with refinement to the methods for data collection. *NIH/NIDCD*

177 Extracellular Matrix Versican is Critical for the Maintenance of Mouse Auditory Sensitivity After Cochlear Injury

, Yazhi Xing[1], Kenyaria Noble[1], Clarisse H Panganiban[1], LaShardai N Brown[1], Edward L Krug[2], Jeremy L Barth[2], Corey H Mjaatvedt[2], Hainan Lang[1]; *[1]Pathology, MUSC, [2]Regenerative Medicine and Cell Biology, MUSC*.

Versican, a large extracellular matrix (ECM) proteoglycan, is found in various mammalian tissues, including blood vessels, skin, developing heart and central nervous system (CNS). The versican gene (Vcan) encodes 4 isoforms (V0 to V3) based on the presence of central glycosaminoglycan-binding regions. In the CNS, versican assembles ECM surrounding the nodes of Ranvier and regulates nerve plasticity, and knockout versican isoforms V0/V2 in Vcantm1Zim mice led to disorganized nodes in CNS. Function of versican in auditory system has not been determined. The aims of our study are 1) to characterize the expression pattern of versican in mouse cochlea, and 2) to determine its role in maintenance of auditory function. qRT-PCR was utilized to examine different versican isoforms in lateral wall and auditory nerve. V0/V2 knockout mouse model was employed for octave band noise exposure, auditory brainstem response (ABR) measurements, immunohistochemical and ultrastructural examinations. Results: qRT-PCR anlaysis indicated that V0, V1, and V2 isoforms were expressed in auditory nerve and V0, V1 were expressed in the cochlear lateral wall. Ultrastructural observation revealed several abnormities in Vcantm1Zim cochleas including 1) severe disorganization of interdigital processes of marginal and intermediate cells, and 2) distortion of satellite cells and myelin sheaths surrounding spiral ganglion neurons. Young-adult Vcantm1Zim and WT mice had similar auditory brainstem response (ABR) thresholds, but WT mice had larger ABR threshold shifts following noise exposure and recovered after 2-4 weeks, whereas Vcantm1Zim mice had a smaller threshold shifts and lost their ability to recover. Conclusions: Multidisciplinary approaches indicated that: 1) versican isoforms are present in the cochlear lateral wall and auditory nerve, and 2) deletion of versican V0/V2 isoforms causes deficiency in recovery from NIHL, although sensitivity to noise exposure is reduced. These results strongly suggest that versican plays an essential role in

maintaining cochlear structural integrity and proper auditory function. *NIH R01 DC7506; NIH P50 DC0422*

178 MEKK4 Signaling Regulates Sensory Cell Development and Function in the Mouse Inner Ear

, Atul K Pandey, Hong-Wei Zheng, Sha Su-Hua, Puligilla Chandrakala; *Pathology, MUSC*.

Mechanosensory hair cells (HCs) residing in the inner ear are critical for hearing and balance. Precise coordination of proliferation, fate-specification and differentiation during development is essential to ensure the correct patterning of HCs in the cochlear and vestibular epithelium. Recent studies have revealed that Fgf20 signaling is critical for proper HC differentiation. However, the mechanisms by which Fgf20 signaling promotes HC differentiation remain unknown. Here, we show that mitogen-activated protein 3 kinase 4 (MEKK4) expression is highly regulated during inner ear development and is critical to normal cytoarchitecture and function. Mice homozygous for a kinase-inactive MEKK4 mutation exhibit significant hearing loss. Lack of MEKK4 activity in vivo also leads to a significant reduction in the number of cochlear and vestibular HCs suggesting that MEKK4 activity is essential for overall development of HCs within the inner ear. Furthermore, we show that loss of Fgf20 signaling in vivo leads to inhibition of MEKK4 activity while gain of Fgf20 function stimulates MEKK4 expression which suggests that Fgf20 modulates MEKK4 activity to regulate cellular differentiation. Finally, to investigate the mechanisms of MEKK4 regulation, we examined the expression of JNK, a known target of MEKK4, and found no alterations in JNK levels in MEKK4 mutants suggesting a novel JNK-independent function in regulation of cell-fate specification and differentiation. Collectively, this study provides compelling evidence of an essential role for MEKK4 in inner ear development, including normal HC differentiation and morphogenesis, and identifies Fgf20 signaling as a novel upstream regulator of MEKK4 function in the mammalian cochlea. *NIDCD/NIH R00, MUSC*

179 An Observational Review of Pediatric Intraosseous Needle Placement in the Pediatric Emergency Department

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The purpose of this study was to compare success rates and time to placement with Manual intraosseous (IO) vs EZ-IO® needles in pediatric emergency department (PED) patients and in a subset ≤ 8kg. This was a retrospective cross-sectional descriptive study of IO attempts in a tertiary care PED from 2006-2014. Cases were identified through diagnosis and procedure codes for IO infusion, CPR, and cardiac arrest as well as admissions from PED to the intensive care unit. Outcome measures included success rate, complications, and time to placement in children with an estimated severity index of 1. Success rate was defined as number of IO's with documented infusion of fluids per number of attempts. Categorical measures were compared with a Z-test for comparison of 2 proportions and continuous with Student's t-tests. Of 1748 charts screened, 50 had an IO attempted with 41 documenting the specific device type. For all patients, the EZ-IO® had a higher success rate for all attempts at 69% (22/32) versus 58% (19/33) (p=0.351). The Manual IO had shorter time to placement at 5.2 minutes (SD 4 minutes) versus 11.1 minutes (SD 6.2 minutes) for the EZ-IO® (p=0.010). In patients ≤ 8kg, the success rate was slightly higher with the Manual IO at 55% (17/31) than the EZ-IO® at 47% (8/17) (p=0.606). The Manual IO again had a faster time to placement at 4.5 minutes (SD 3.7 minutes) versus 12.8 minutes (SD 7 minutes) (p=0.0151). Two patients had extravasation with the EZ-IO®. Results suggest that the EZ-IO® has a higher success rate in all children. Both devices have lower success rates in children ≤8kg, with the Manual IO having a higher success rate. The difference in success rates was not statistically significant in either group. The Manual IO does have a significantly faster time to placement in all ages.

180 Microgravity Induction of TRAIL in Preosteoclast Cells Enhances Osteoclastogenesis

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Evidence indicates that astronauts experience significant bone loss in space. We previously showed that simulated microgravity (μXg) using the NASA developed rotary cell culture system (RCCS) enhanced bone resorbing osteoclast differentiation. However, the mechanism by which μXg increases osteoclast formation is unclear. RANK/RANKL signaling pathway is critical for osteoclast differentiation/activity. Tumor necrosis factor-related apoptosis inducing ligand (TRAIL) has been shown to increase osteoclastogenesis. We hypothesize that TRAIL may play an important role in μXg enhanced osteoclast differentiation. In the present study, we identified by RT profiler PCR array screening that μXg induces high levels (10-fold) of TRAIL expression in mouse bone marrow derived preosteoclast cells compared to ground based (Xg) cultures. Western blot analysis of total cell lysates obtained from μXg subjected preosteoclast cells further demonstrated increased (5-fold) levels of TRAIL protein expression. Also, real-time PCR analysis showed a significant increase (12-fold) in TRAIL mRNA expression in these cells. We further identified that μXg elevated TRAF-6 protein and mRNA expression in preosteoclast cells. Also, tartrate resistant acid phosphatase (TRAP) expression levels were increased in these cells without RANKL stimulation. We further identified that addition of TRAIL to RAW 264.7 cells cultured in the presence of RANKL and MCSF

potentiated osteoclast differentiation. Interestingly, neutralizing antibody against TRAIL significantly reduced μXg induced osteoclast formation. These results indicate that TRAIL signaling plays an important role in the μXg increased osteoclast differentiation. Therefore, inhibition of TRAIL expression could be an effective countermeasure for μXg induced bone loss.

181 Multiscale Measurement Error Models for Aggregated Small Area Health Data

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Spatial data are often aggregated from a finer (smaller) to a coarser (larger) geographical level. The process of data aggregation induces a scaling effect, which smooths out the variation in the data. To address the scaling problem, multiscale models that link the convolution models at different scale levels through the shared random effect have been developed. One of the main goals in aggregated health data is to investigate the relationship between predictors and an outcome at different geographical levels. In this paper, we extend multiscale models to examine whether or not a predictor effect at a finer level will hold true at a coarser level. To address the predictor uncertainty due to aggregation, we applied measurement error models in the framework of multiscale approach. To assess the benefit of using multiscale measurement error models, we compare the performance of multiscale models with and without measurement error in both real and simulated data. We have found that ignoring measurement error in multiscale models results in attenuation estimates for regression coefficients. On the other hand, accounting for measurement error in multiscale models provides a better model fit and unbiased parameter estimates. *NIH R01 CA172805*

182 Alpha 1-anti Trypsin Protects Islet Grafts From Death Via Alleviation of Instant Blood-mediated Inflammatory Reaction After Intraportal Islet Transplantation

, Jingjing Wang, Zhen Sun, David B Adams, Katherine A Morgan, Hongjun Wang; *Surgery, MUSC*.

As many as 50-60% islets die within the first 3 days of transplantation, even under optimal conditions. A major cause of early islet loss is instant blood-mediated inflammatory reaction (IBMIR) that is characterized by initiation of coagulation cascade and infiltration of leukocytes. Here, we determined whether clinical-grade human alpha1-antitrypsin (AAT), a serum serine-protease inhibitor, can inhibit IBMIR and enhance islet graft survival and function after islet transplantation. A marginal mass of islets (n=250) from C57BL/6 mice was infused into the liver of syngeneic recipients that had been rendered diabetic by streptozotocin. In the AAT group, mice were given AAT (2mg/kg) every three days (Q3Days) or every 2 days (Q2Days) for a total of 8 doses from day 0 of transplantation. Control mice received vehicle only. Blood glucose levels were measured twice per week to monitor graft function. More mice from AAT groups reached normoglycemia (70%, 55.5% and 37.5% for Q3Days, Q2Days and control, respectively, n=10) at 30 days post-transplant (PT), with significantly better glucose tolerance compared with the control group as manifested by the intravenous glucose tolerance test. Moreover, significantly less C-peptide release, and reduced TUNEL-positive islet cells were observed in AAT group, indicating less islet grafts damage and apoptosis. Furthermore, AAT suppressed coagulation pathways by diminishing tissue factor production, reducing plasma thrombin-antithrombin complex level and fibrin deposition on islet grafts. Also, decreased lymphocytes infiltration was observed 6 hours PT, together with reduced serum TNF-alpha levels and repressed NF-kappaB translocation in livers in the AAT groups compare with the control group. In summary, we have demonstrated that AAT significantly reduces the loss of islet grafts after intraportal islet transplantation in diabetic mice by the mitigation of inflammation and coagulation in IBMIR. AAT therapy can be used in human islet transplantation to prevent islet death during peri- and post-transplant periods.

183 Phosphorylation of Membrane Type-1 Matrix Metalloproteinase Regulates Cellular Localization in Primary Aortic Fibroblasts

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Background: Matrix metalloproteinases (MMPs) contribute to extracellular matrix remodeling associated with the development of thoracic aortic aneurysms (TAAs). In particular, membrane type-1 MMP (MT1-MMP) plays a direct role in development, as TAA formation was attenuated in transgenic mice with reduced MT1-MMP. Accordingly, understanding the mechanisms regulating MT1-MMP abundance and activation during TAA development may provide therapeutic insights. Recent evidence suggests that, by virtue of being a type-1-transmembrane protein, MT1-MMP may be subject to protein kinase C (PKC)-mediated mechanisms, which regulate trafficking and intracellular localization of MT1-MMP. Therefore, this study tested the hypothesis that PKC-mediated phosphorylation of MT1-MMP regulates cellular localization and function, which is altered in TAA fibroblasts. Methods and Results: To examine the cellular localization of MT1-MMP, primary cultures of aortic fibroblasts were isolated from control mice and after 4-weeks of TAA induction. Cells were transfected with green fluorescent protein (GFP) tagged MT1-MMP (pCMV-MT1-MMP-GFP, C-terminal GFP). Fixed cells (4% paraformaldehyde) were imaged by confocal microscopy. The results showed that MT1-MMP was

localized on the plasma membrane in the control aortic fibroblasts, while it appeared to be localized in endosomes in the TAA fibroblasts. Aortic fibroblasts from control mice were incubated with a pan-PKC activator (phorbol myristate acetate PMA, 100 nM), a PKC-delta-specific inhibitor (Rottlerin, 3 uM), or both. PKC activation with PMA induced internalization of MT1-MMP. Immunoblotting and zymography revealed that PMA exposure reduced the abundance of the active form of MMP-2 and activated (phosphorylated) Smad-2. Importantly, these effects were inhibited by pretreatment with Rottlerin. Conclusion: Phosphorylation not only mediates MT1-MMP cellular localization, but also alters its function through regulating its access to specific substrates; shifting its role from pericellular proteolysis (activation of MMP-2) to intracellular signaling (TGF-Beta pathway activation). Therefore, targeted inhibition of MT1-MMP phosphorylation/internalization may hold therapeutic relevance as a means to attenuate TAA development.

184 Markers of Adaptive Immunity Decline in Liver During Interferon-free Treatment of Chronic HCV Infection, But Do Not Differ By Treatment Outcome

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BACKGROUND. Chronic infection with hepatitis C virus (HCV) affects 170 million people worldwide. HCV-related deaths are most commonly due to end-stage liver disease and hepatocellular carcinoma. HCV treatment is now possible with oral, interferon-free regimens composed of directly activating antiviral (DAA) agents. Although DAA therapy improves rates of sustained virologic response (SVR, synonymous with cure), virologic relapse can occur after treatment, although mechanisms are unclear. METHODS. To understand how host immunity is impacted by treatment, and to explore differences in immunity that might reflect or impact treatment outcome, we performed immunohistochemistry (IHC) on liver biopsies obtained from subjects treated with DAA agents who achieved SVR or relapsed. Paired pre- and post-treatment liver biopsies from 13 treatment-naïve HCV subjects (n=9 SVR, n=4 relapse) were used. IHC was performed with antibodies specific for CD4, CD8, CD56, CD68, CD20, TIA-1, and alpha-smooth muscle actin (ASMA) to delineate specific cellular populations. Image capture was performed on stained liver sections, followed by manual annotation to demarcate parenchymal and portal triad regions. Quantitative image analysis was performed using Visiopharm software to enumerate total pixel and cellular counts in parenchymal and portal triad regions. RESULTS. CD8+ cells decreased markedly after DAA therapy in both parenchymal and portal triad regions irrespective of treatment outcome. CD20+ signal decreased in parenchymal areas while CD4+ signal decreased in portal triads. Other markers (CD56, TIA-1, KP-1, ASMA) did not change during treatment or differ by outcome. Interestingly, we observed a trend toward lower pre-treatment CD4+ signal in portal triad regions of subjects who eventually relapsed compared to subjects who achieved SVR. CONCLUSION. Our results indicate that DAA therapy results in decreased hepatic markers of adaptive immune cells (CD8, CD4, CD20) while markers of innate immune cells (CD68, CD56), activated stellate cells (ASMA), and apoptosis (TIA-1) did not change.

185 MicroRNA 204 Expression Disrupts Normal Lactation in the Mouse Mammary Gland

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Introduction/Rationale The mammary gland develops through several distinct stages, pre-pubertal and pubertal growth, pregnancy, lactation and involution. However, lactation is the primary function of the mammary gland. Upon pregnancy the combined actions of progesterone and prolactin generate alveoli, which secrete milk during lactation. Lack of demand for milk at weaning initiates the process of involution whereby the gland is remodeled back to its pre-pregnancy state. Our knowledge of mammary gland development has significantly contributed to our understanding of breast cancer and has advanced the discovery of therapies to treat this disease. Until recently, data regarding the role of microRNAs in the mammary gland have been scarce and mainly focused on their abnormal expression in breast cancer. We identified miR-204 as a novel oncomir and are interested in defining its role during normal mammary gland function. Methods In this study, we generated a unique dox-inducible miR-204 transgenic mouse model that allows us to temporally express miR-204 specifically in the ductal epithelium of the mammary gland at specific stages of normal mammary development. We extracted mammary glands for whole mount analysis and performed H&E and immunohistochemical staining. We also extracted RNA and protein to assess miR-204 and direct target expression levels. Results The increased expression of miR-204 during lactation resulted in a defect that led to an inability to nurse efficiently. Histologically, the mammary glands of the lactating miR-204 transgenic mice were distinguished by the lack of glandular structure, an abundance of adipocyte tissue, abnormal/involuting lobuloalveolar structures and an accumulation of large cytoplasmic lipid droplets in the alveolar epithelial cells. Pup weight was significantly lower as a result. Conclusions Our data suggests that miR-204 is important for the normal biology of the mammary gland specifically that the deregulation of miR-204 affects lactation and points to a potential defect in secretory activation. *DOD-W81XWH-10-BCRP-IITA*

186 Contribution of Hematopoietic Stem Cell-derived Osteoblasts in the Osteosarcoma Microenvironment

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Osteosarcoma (OS) is the most common primary bone sarcoma. Recent studies have shown that tumor microenvironment co-evolves with tumor and a better understanding of tumor/bone interactions is the need for developing new therapeutics. Our lab has demonstrated that hematopoietic stem cells (HSCs) give rise to Obs in normal bone and during non-stabilized fracture. We theorize that OS microenvironment would have non-malignant Obs derived from HSCs as well as stromal cells and thus, examined their relative contribution. Conditioned media (CM) from Obs cultured from non-adherent (hematopoietic) portions of bone marrow (BM) increased proliferation, migration and invasion of OS cells to a greater extent than CM from Obs from adherent (stromal) portion of BM. Mice transplanted with non-adherent cell population of the bone marrow (enriched for HSCs) were generated, bone chips digested and cells sorted for GFP- cells (resident cell population) and GFP+ cells (donor or HSC-derived cells). There was an increase in proliferation, migration and invasion of OS cells by GFP+ Obs CM when compared to GFP- Obs CM. Collectively, these data provide important clues about the role of HSC-derived Obs in OS progression. But in order to distinguish it from the role of stromal-derived population, we used the Obs from a dual reporter mouse which expresses GFP in the all hematopoietic-derived cells and Red Fluorescent Protein (RFP) in the non-hematopoietic cells. We digested long bones and sorted the cells for GFP+ (HSC-derived) and RFP+ cells (stromal-derived). CM from GFP+ Obs increased proliferation, migration and invasion of OS cells to a greater extent when compared to CM from RFP+ Obs. This demonstrates that HSC-derived Obs are more tumorigenic than the stromal-derived ones and targeting this subset of the OS microenvironment will be more beneficial in inhibiting tumor progression. *ACS-IRG #IRG-97-219-14; Pathology and Lab Medicine*

187 Presence of Hematopoietic Stem Cells Derived Cells in the Dental Pulp and Periodontal Ligament

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While the complex structural composition of teeth provides hardness and durability, structures like dentin and periodontal ligament (PDL) are vulnerable to damage and require constant maintenance. It is generally believed that regeneration of both odontoblasts (which secrete dentin) and PDL cells is provided by stem cells in pulp and those residing in the PDL. Recent studies have shown that bone marrow (BM) cells can differentiate into pulp cells and regenerate PDL. Using a single hematopoietic stem cell (HSC) transplantation model, we have previously shown that fibroblast and osteoblasts are derived from HSCs. While earlier studies have suggested that cells with HSC markers (CD34, CD45) can be found in dental tissues, it has yet to be established that HSCs can differentiate into cells in pulp and PDL. Previously we have shown that after transplantation of clonal cells derived from a single enhanced green fluorescent protein (EGFP+) HSC into lethally irradiated mice, numerous GFP+ cells can be demonstrated within the pulp and PDL. To conclusively prove that HSC-derived cells are present in the dental tissues, we analyzed the pulp and PDL from a dual reporter mouse which expresses GFP in the all hematopoietic-derived cells and Red Fluorescent Protein (RFP) in the non-hematopoietic cells. Flow cytometric analysis showed that 64 ± 13% of cells in the pulp and 50 ± 20% of cells in the PDL expressed GFP and α-smooth muscle actin (ASMA; marker for fibroblasts in pulp and PDL). Immunofluorescent staining of cells from pulp and PDL also demonstrated the presence of GFP positive cells which co-expressed ASMA. Thus, our studies demonstrate that HSC-derived cells are present in the pulp and PDL, and this may open new avenues of therapy for a number of dental diseases and injuries through the use of this novel source. *NIH P30 GM103331; NIDCR R03 DE024536; Pathology and Lab Medicine*

188 Chemokines Implicated in the Progression of High-Grade Serous Ovarian Carcinomas Overexpressing GAB2

, Christopher M Duckworth, Lixia Zhang, Steven L Carroll, Stephen P Ethier, Hiu Wing Cheung; *Pathology and Laboratory Medicine, MUSC*.

For many women, a diagnosis of serous ovarian cancer sounds like a death sentence. Given that above 80% receive this diagnosis at an advanced stage, and that the 5-year survival rate is only 9-34%, such a woeful outlook could seem justified. High-grade serous ovarian carcinomas (HGSOCs) comprise most of these cancers, and our previous research found 36% of primary ovarian tumors had amplification in the 11q14.1 chromosomal region. From this region, the scaffold adapter GAB2 was identified as a formidable oncogene in HGSOCs. To resolve some mystery concerning GAB2-amplification's role in ovarian carcinogenesis, this study was initiated. We suppressed the function of GAB2 in-vitro and in-vivo in order to determine both the effect on ovarian tumor growth and the nature of its role in tumorigenesis, resulting in reduced tumor burden, reduced PI3K/mTOR signaling, and inhibited proliferation and angiogenesis. We overexpressed GAB2 in ovarian cancer cells to identify, via a large-scale antibody array, which associated signaling molecules were affected by this amplification. Our experiments revealed the chemokines CXCL1, CXCL2, and CXCL8 were dependent on this GAB2 inducibility. By exploring the role of GAB2-induced

chemokines in tumor angiogenesis, we found they promoted tubular formation through CXCR2. We subsequently confirmed that the GAB2-induced chemokines promoted ovarian cancer cell proliferation and survival in an autocrine manner. Through successive experiments with inhibitors, we determined the expression of these chemokines is reliant on IKKB-NF-kB signaling, not PI3K as suspected. This finding was validated via shRNA knockdown. Finally, we investigated effective novel combinatorial therapies, pinpointing one that reduced clonogenic growth and proliferation. In GAB2-amplified ovarian cancers, cell proliferation, angiogenesis, survival, and tumor growth were advanced by the upregulation of chemokine expression. Future directions include in-vivo drug treatment studies with combinatorial therapy co-targeting IKKB and PI3K pathways downstream of GAB2. We are also breeding expression-inducible GAB2 transgenic mice. *Pathology and Laboratory Medicine Start-Up Fund*

189 MicroRNAs As Regulators of Senescence in the Cochlear Lateral Wall of Aged Mouse

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Age-related hearing loss (presbycusis) affects greater than one-third of the population over 60 years old. Pathological alterations to the cochlear lateral wall (CLW) disrupting the maintenance of endocochlear potential are a major cause of presbycusis. In an animal model of presbycusis, we observed an age-dependent decline in spiral ligament fibrocyte turnover. Senescent cells accumulate in aged tissues, leading to a loss of tissue regenerative capacity. With the emergence of microRNAs (miRNAs) as key regulators of senescence and cell cycle, we investigated miRNA expression in the CLW as a function of age. Microarray analysis using RNAs isolated from CLW tissues of young-adult (2-3M) and aged (1.5-2Y) CBA/CaJ mice identified 79 miRNAs differentially expressed (DE) with age. Two of these DE miRNAs have been implicated in controlling transcriptional regulation of senescence in >6 human/mouse models of aging and four have specific roles in cell cycle arrest in multiple species/tissues. Microarray analysis detected 1074 DE mRNAs in aged CLWs. Evaluation of putative miRNA-mRNA relationships using Ingenuity Pathway Analysis software linked 30 of the DE miRNAs with 195 of the DE mRNAs. Enrichment analysis of the 195 predicted mRNAs targets identified cell cycle regulation as a top significant function. Further analysis of the 195 DE mRNAs identified 26 targets whose expression change correlated with an increase in senescence and cell cycle arrest, including four transcription factors and a D-type cyclin involved in the cdk/pRb/E2F pathway. In situ hybridization showed that two DE miRNAs who have multiple senescence-associated predicted targets were highly expressed in strial marginal cells and spiral ligament root cells of the CLW. Our investigation reveals age-related alterations in miRNA and mRNA expression in the CLW that are predicted to influence cellular senescence. These results implicate miRNAs as determinants in maintaining normal CLW homeostasis and as candidates in influencing CLW degeneration and presbycusis. *NIH R01 DC012058, P50 DC00422, P30 GM103342, and P20 GM103499*

190 Informed Consent: Simplifying the Hollings Cancer Center (HCC) Biorepository Form

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Background: Informed consent is an ethical process that provides a potential subject with sufficient information to make an educated and voluntary decision to participate in human research. Many biobank consent forms are overly complex and excessively long, as relevant information and legal elements that are intended to protect the interests of the institution are intertwined and expounded far beyond the average reading level. Thus, the subject is unable to fully understand what he or she is consenting to. The informed consent process ensures that the subject understands what he or she is consenting to, so relevant information should be written at an 8th-9th grade reading level. The primary concern regarding consent should not be to obtain a subject's signature. Rather, the concern should be providing information that the consenting subject understands. Objective: The purpose of this project was to simplify the current Hollings Cancer Center (HCC) consent form with the goal of developing two separate documents: (1) Informed Consent; and an (2) Informed Consent Supplement. Methods: The HCC consent form contains 3,655 words and is written at a grade level of 12.3, both of which are excessively demanding. We used the Readability-Score instrument to evaluate the grade level. We divided the informed consent form into two documents: a simplified consent form and a facts supplement containing additional information pertaining to the simplified consent form. Till now, we have been able to reduce the consent form to 1,530 words (58% reduction) and a reading grade level of 7.7. Conclusions: Further changes may be necessary as our proposal is reviewed by respective authorities. We hope the HCC biobank will adopt some version of this project, and spark conversation throughout the health care and research communities about the appropriate uses of language in conveying required information in consent forms.

191 Indentifying, Understanding, and Addressing Moral Distress

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Title: Identifying, Understanding, and Addressing Moral Distress Background: Moral Distress is an ethical dilemma and under-acknowledged feature of working with patients among all specialties. The first definition was published in 1984, as a phenomenon in which one knows the right action to take, but is constrained from taking it. It can be argued that this definition is not multidimensional or applicable to real life situations. In addition to the vague definition, there is a lacking research on the topic in regards to how to identify, reduce, and address moral distress before it manifests into anger, anxiety, depression, and job dissatisfaction. Right now most of the research and publications on moral distress focus on Nursing, and there is little documented on moral distress in other specialties. Objective: The purpose of this project is to further the research and planning of the moral distress workshop I will be doing at MUSC for nurses, professors of nursing, and nursing students. The goals are to open lines of communication, focus on possible strategies for minimizing moral distress in the MUSC community, and to refine the very definition of this phenomenon to increase applicability in the work place. Methods: A workshop will be held at MUSC this spring. Several volunteers will be asked to contribute anonymous accounts of when they have thought to experience moral distress. These stories will be shared among attendees. The participants will answer a ten question survey at the beginning of the day, followed by plenary sessions, and focus group discussions. A minimum of three speakers will attend, sharing their expertise and/or experience on moral distress in Ethics, Nursing, and Philosophy. Conclusion: The results will follow the conclusion of the workshop. We are anticipating publishing on our findings of moral distress education at MUSC, new strategies for addressing ethical dilemmas, and safe outlets where concerns can be shared.

192 Oxygen Diffusion Based Optimization of Spheroid Size for Human Cardiac Repair

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Objective: Cardiac spheroids have great potential to be an effective cell delivery system for improving cell retention and survival, which are major hurdles for developing clinically applicable cell based therapies for human cardiac repair. The size of cardiac spheroids is a dominating factor for cell viability. This study was designed to develop and validate an oxygen diffusion finite element model to determine the effect of spheroid size on cell viability based on oxygen concentration distribution. Methods: A time-dependent oxygen diffusion model was developed using COMSOL software. The concentration-dependent oxygen consumption rate (OCR) of cardiomyocytes was considered in the model. The cell viability was correlated to the critical oxygen concentration. The model was validated by a spheroid viability assay. The effects of spheroid size, cell metabolic rate, oxygen diffusivity, and hypoxia on cell viability were all quantitatively determined. Results: The predicted viable cell distribution within cardiac spheroids is consistent with the results of the cell viability assay. Increasing spheroid size decreases the oxygen concentration within spheroids. At the baseline, cell death occurs when the diameter of the spheroid is greater than 0.35mm. Increasing OCR due to cardiomyocyte stimulation further reduces the critical diameter to 0.25mm. The oxygen diffusivity, hypoxia, and critical oxygen concentration all impact spheroid cell viability. Discussion: The acute death of cardiomyocytes is dictated by oxygen availability. The oxygen concentration distribution within spheroids is determined by the balance between the oxygen diffusion rate and OCR. Due to the diffusion limit, our results suggested an upper limit value of spheroid size based on cell viability. The lower limit value can be determined by studying the effect of spheroid size on cell function/differentiation, which leads to future works. This study is critical because cell/tissue nutrition and viability are the primary requisites for the biological repair of nearly all tissues. *NIH P20 GM103444*

193 Roles for the Complement Anaphylatoxins C3a and C5a in Regulating Tumor Immunity Following Radiation Therapy

Colleen E Quaas[1], Merry Andersen[1], Andrea Whitfield[2], Andrew Ellis[3], Mario Fugal[3], Kenneth Vanek[3], Melissa Scheiber[1], Stephen Tomlinson[1]; *[1]Microbiology and Immunology, MUSC, [2]Pediatrics, MUSC, [3]Radiation Oncology, MUSC*.

The complement system, comprised of over 30 soluble and cell surface proteins, is a vital component of the both the innate and adaptive immune systems. Complement activation leads to the generation of pro-inflammatory anaphylatoxins, C3a and C5a. These pro-inflammatory mediators have been shown to promote tumor growth. Using a mouse model of subcutaneous lymphoma (EL4), localized radiation therapy (RT) was shown to significantly reduce the tumor growth rate and increase survival in C3aR/C5aR knockout (KO) mice compared to wild-type (WT) mice. Thirty-seven days post initial RT, 66.7% of the KO that received RT had no detectable primary tumor. These six mice were re-challenged with EL4 cells. After an additional 37 days, 5 of the 6 re-challenged KO mice had no detectable primary tumor, suggesting an anti-tumor memory response. Further studies are being done to confirm and determine the mechanism(s) responsible for this anti-tumor immune response. We are also currently investigating the use of C3aR and C5aR antagonists in EL4 tumor-bearing WT mice treated with or without radiation therapy. Using synthetic peptides to block the

complement anaphylatoxin receptors may prove to be a promising strategy to enhance already established cancer therapies. *NIH R01 CA158179*

194 An Examination of Multielectrode Array Recordings in the Nucleus Accumbens of C57Bl6 Mice

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Alcoholism poses grave problems for affected individuals, the economy, and society as a whole. However, the underlying neurobiological mechanisms that predispose certain individuals to habitual, inflexible alcohol seeking and that facilitate the continuance of alcohol consumption remain unclear. Previous findings indicate that neuronal activity in the nucleus accumbens (NAc) is synchronous at certain frequencies during the performance of habitual behaviors. The current study was designed to determine if multielectrode arrays (MEAs) could be used to record from individual units in the NAc, with the ultimate goal of obtaining more detailed information on cellular activity in this region during habitual ethanol seeking. In vivo MEA recordings were taken from the NAc shell of two male C57Bl6 mice. Spike sorting was subsequently performed in order to identify firing activity in individual neurons. Initial findings indicate that activity from single neurons can reliably be observed in the NAc. Future research will investigate the effects of chronic intermittent ethanol exposure (CIE) on neuronal activity in the NAc, thus providing researchers with further insight into the neural circuitry that contributes to inflexible ethanol seeking. *Neuroscience T25 grant*

195 Q12 NAC and 1,25-(OH)2Vitamin D3 Negatively Affects Weight and Behavioral Reflexes After LPS-HI Injury in the Neonatal Rat

, Lauren E Adams[1], Danielle W Lowe[2], Andrew Barbour[2], Inderjit Singh[2], Dorothea Jenkins[2]; *[1]Academic Magnet High School, [2]Pediatrics, MUSC*.

A previous clinical trial suggested NAC dosing could benefit from Q12 treatment. To understand the safety and efficacy of Q12 NAC +1,25VitD, we investigated the effects of this therapy with hypothermia after LPS-HI and hypothesized outcome measures would improve compared to hypothermia alone. Using a HI-LPS model in PND7 rats, we pretreated animals with 0.5 mg/kg LPS 4h before right carotid artery ligation and 90 min 8% O_2 exposure. 5 rats were randomized to Sham (no LPS, sham surgery), 9 to LPS-HI with Hypothermia (Veh), and 14 to LPS-HI with Hypothermia and Q12 NAC 25mg/kg +1,25VitD 0.05µg/kg i.p. (NAC+1,25VitD) for [GSH] quantification Pre-LPS-HI, Post-LPS-HI and Post-Hypothermia by MRS. A separate group of 7-11 rats were randomized to Sham, Veh, or NAC+1,25VitD, and weights and behavioral testing recorded PND6-12. [GSH] was reduced by LPS-HI compared to Pre-LPS-HI levels ($p<0.001$). NAC+1,25VitD improved [GSH] to near baseline, with 12/14 NAC+1,25VitD treated animals improving vs. only 2/9 Veh ($p=0.007$). Behaviorally, LPS pretreatment alone delayed cliff aversion ($p<0.001$) and righting reflex ($p=0.030$) compared to Sham. Veh behavior testing returned to baseline within 24h. NAC+1,25VitD were significantly slower on cliff aversion compared to Veh and Sham on PND8 and PND9 ($p<0.01$) and Sham on PND10 ($p=0.017$) before returning to baseline. For righting reflex, NAC+1,25VitD were slower than Veh and Sham only on PND8 ($p<0.05$). Both LPS-HI groups weighed significantly less than sham after surgery PND8 to 12 ($p<0.001$), and NAC+1,25VitD weighed significantly less than Veh PND9 through 12 ($p<0.05$). In conclusion, NAC+1,25VitD significantly improves [GSH] within 1.5h of treatment, suggesting oxidative stress during acute neuroinflammation can be quickly ablated by NAC+1,25VitD. Negative effects on weight gain and behavioral reflex recovery time in rats treated with Q12 NAC+1,25VitD and observed 1,25VitD accumulation in a phase 0 clinical HI trial suggest VitD dosing needs to be revised.

196 Effects of TMS on Response to Cues in Different ROIs in Cocaine Addicts

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Abstract not available.

197 Developmental Origins of Bicuspid Aortic Valves

, Nicolas E Alcala[1], Josh Mifflin[1], Loren Dupuis[2], Sarah Thibaudeau[2], Kern B Christine[2]; *[1]College of Charleston, [2]Regenerative Medicine and Cell Biology, MUSC*.

Abstract not available.

198 Impedance pH and Esophageal Motility Findings in Chronic Cough Patients

, Aimee C Weber[1], Emily M Green[1], Shaun A Nguyen[2], Lucinda A Halstead[2]; *[1]College of Medicine, MUSC, [2]Otolaryngology-Head and Neck Surgery, MUSC*.

Acid reflux is a major cause of chronic cough, but the contribution of the full spectrum of esophageal disorders to cough is rarely investigated. Utilizing esophageal manometry and multichannel intraluminal impedance pH leads to effective and targeted treatments for chronic cough originating in the upper gastrointestinal tract. A retrospective chart review of chronic cough patients referred to the laryngology clinic, between January 2012 and September 2014 was conducted. Eighty patients, 22 males and 58 females with an average age of 57.12 years (range 17-82), complaining of non-specific chronic cough were included. Associated symptoms of throat clearing, hoarseness, sore throat, globus sensation,

dysphagia, swallowing dysfunction presented in 74/80 patients. Gastroesophageal reflux disease or laryngopharyngeal reflux was previously diagnosed in 58/80 patients, 55 of which were taking a proton pump inhibitor. 64/76 patients that underwent a multichannel intraluminal impedance pH study had reflux; however, only 50.0% were properly managed. Motility issues were identified in 68.8% of patients tested (55/79). 39/80 (48.8%) patients had severe enough issues that the patients were referred to other physicians to address their underlying pathology. 70% of the patients tested experienced an improved outcome as a result of responding to new treatment including altering acid management, adding a promotility agent or baclofen, or through productive referrals. Investigation of the entire spectrum of gastrointestinal disorders that may impact cough with esophageal manometry and multichannel intraluminal impedance pH yields a more complete diagnosis and rapidly suggests comprehensive treatment. Additionally, these studies can quantitatively rule out certain cough etiologies, prompting further investigation and treatment of other causes.

199 Association of Vitamin D and Glucose Tolerance in Pregnant Women

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Background and Objective Vitamin D is linked to glucose metabolism, but its role in gestational diabetes is unclear. This study seeks to determine the effect of vitamin D status on glucose tolerance test results and adverse pregnancy outcomes in pregnant women. Methods A post hoc analysis of two vitamin D supplementation studies with a total of 443 pregnant women was conducted. Vitamin D status (25(OH)D) was determined by radioimmunoassay. Serum glucose levels were evaluated by a 2-step diagnostic screening for gestational diabetes with a cutoff for an abnormal 1-hour screen of 139 mg/dL and 2 abnormal values on a 3-hour oral glucose tolerance test. Adverse outcomes analyzed were preterm birth (<37 weeks), birth weight <1500 grams, macrosomia/large for gestational age (LGA), need for NICU admission, and non-repeat Caesarian section. Results Vitamin D deficiency (<20 ng/ml) and insufficiency (<30 ng/ml) were associated with glucose tolerance test results >139 mg/dl when controlling for BMI >30 and ethnicity (p=0.0048 and p=0.0254, respectively). A screening glucose tolerance test result of >139 mg/dL was also significantly associated with non-repeat Cesarean section deliveries (p=0.0144). Discussion Vitamin D deficiency and insufficiency are associated with an increased risk of failing a screening glucose tolerance test during pregnancy, suggesting that vitamin D deficiency is a risk factor for glucose intolerance and potentially gestational diabetes. *NICHD R01 HD043921; UL1 RR029882; W. K. Kellogg Foundation FDA IND 66,346; HR 20570*

200 Revascularization of Smokers with Claudication Does Not Limit Quality of Life Despite a Higher Risk of Late Failure

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BACKGROUND: Tobacco smoking after lower extremity revascularization for claudication has been shown to increase the risk of major adverse limb events (MALE) and decrease amputation-free survival (AFS). A recent study has suggested that claudicants would experience better overall quality of life with revascularization even if they continue to smoke. METHODS: Patients with symptoms of PAD limited to vasculogenic claudication were examined in a retrospective, cohort study. The primary outcomes of interest were calculated quality of life (cQoL) in smokers undergoing direct revascularization compared with those receiving medical therapy only as well as the recidivism rate for smoking. The cQOL was determined for each patient at follow-up based on the actual treatment received and subsequent outcomes of this treatment. RESULTS: Over a recent 54 month period, among patients referred with vasculogenic claudication, 86 were actively smoking compared with 186 who were not at the time of initial referral. Among initial non-smokers, revascularization was performed by open surgical (27%) or endovascular (44%) intervention, while 28% received medical therapy only. Open surgical (2%) or endovascular (4%) therapies were performed in initial smokers, while 93% were offered only medical therapy. The recidivism rate among initial non-smokers was 12%, while 26% of initial smokers had stopped at the time of last follow-up. Among patients who underwent intervention, the cQOL of patients smoking at the time of last follow-up was not significantly worse than those who were not (.80 + .07 vs .83 + .08, P=.11). CONCLUSION: Significant recidivism for smoking occurs among patients who have stopped smoking in order to receive revascularization. At least in the mid-term, smokers with claudication may benefit more from revascularization than medical therapy alone. The guideline not to directly intervene on smokers with claudication should be re-examined.

201 Ganoderic Acid DM As a Complementary and Alternative Therapeutic Agent for the Treatment of B-cell Lymphoma

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Abstract not available.

202 FCRL As a Target for Immunotherapy of B-cell Lymphoma

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Abstract not available.

203 The Role of Commensal Flora in Osteoclast Differentiation

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Abstract not available.

204 Transoral Robotic Surgery for Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis

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Objective: To determine the effect of transoral robotic surgery (TORS) on sleep-related outcomes in patients with obstructive sleep apnea (OSA) Study Design: Systematic review and meta-analysis Data Sources: PubMed-NCBI and Scopus databases Review Methods: Literature searches by two independent researchers were conducted using the PubMed-NCBI and Scopus database. Studies on TORS for OSA that included pre- and post-operative apnea-hypopnea index (AHI) scores were included. Articles that studied TORS as treatment for diseases other than OSA were excluded. Response was defined as a reduction in AHI >50%, success as a reduction in AHI >50% and a postoperative AHI <20, and cure as a postoperative AHI <5. Results: A total of 6 articles with 353 patients treated with TORS for OSA met inclusion criteria. Pooled analyses (baseline vs. post-surgery) showed a significant improvement in AHI (44.3 ± 23.4 to 17.8 ± 16.9, p <0.00001), Epworth Sleepiness Scale (12.8 ± 5.4 to 5.8 ± 3.7, p <0.00001), lowest O2 saturation (79.0 ± 9.5 to 84.1 ± 6.5, p < 0.00001), and visual analog scale for snoring (9.3 ± 0.8 to 2.4 ± 2.43, p <0.0001). Surgical response rate was 67.1% (95%CI, 61.7% to 72.4%), success rate was 76.7% (95%CI, 56.1% to 92.2%), and cure rate was 25.6% (95%CI, 15.9% to 36.7%). Conclusion: TORS is clinically effective in reducing AHI and symptoms of sleepiness in adult patients with OSA. It is considered successful in a majority of cases, however further studies must be performed to optimize patient selection criteria in order to improve success. *Dept of Otolaryngology*

205 Predicting Motor Outcomes with 3 Month Prone Hip Angles in Premature Infants

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Prematurity is a significant risk factor for cerebral palsy, but brain injury in preterm infants is largely latent, as head ultrasound shows only the most gross injury. White matter injury frequently leads to spastic muscle tone, which precedes and leads to maladaptive motor movements (CP). In a research program designed to detect abnormal tone and motor patterns early, I examined videotapes from an existing cohort of n = 35 preterm infants at 3 months corrected age (CA) who had concurrent Test of Infant Motor Performance (TIMP) scores. Hyperflexion at the hip produces common gait anomalies seen in children with CP, therefore I analyzed hip angle in the prone head lift position at 3 months CA. Magnetic Resonance Spectroscopy (MRS) was performed at term equivalent (n = 23) and Bayley-III neurodevelopmental tests were performed at 1 year (n = 28). I correlated hip angles with TIMP and Bayley-III scores, and neuronal metabolites by MRS. Hip angle positively correlated with TIMP at 3 months (r = 0.642, p = <0.001), but not with Bayley-III at 1 year (r = 0.122, p = 0.529). Hip angle correlated negatively with myo-inositol (mI) ratios in frontal white matter tracts (mI:Cr r = -0.520, p = 0.011). These results suggest that prone hip angle may be a quantitative proxy for the 42-item TIMP at 3 months, and that hypertonicity in the hip flexor musculature is a manifestation of diffuse white matter injury with astrogliosis (mI/Cr). The non-significant correlation between hip angle and Bayley-III may be due to interventions offered to infants with low TIMP scores at 3 months. This suggests that the trajectory of motor development is malleable between 3 and 12 months CA and that interventions at this age are instrumental in improving future motor outcomes.

206 T2* MRI Assessment of Hepatic Iron Distribution in Pediatric Patients with Sickle Cell Hemoglobinopathies

, Hampton B Sasser[1], Heather Collins[2], Anil Rao[3]; *[1]COM, MUSC, [2]Biomedical Imaging, MUSC, [3]Radiology, MUSC*.

Abstract not available.

207 The Role of Antiphospholipid Antibodies in Valvular Heart Disease Among Patients with Systemic Lupus Erythematosus (SLE)

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Purpose: Our aims were to evaluate whether anti-phospholipid antibodies (aPA) levels correlate with heart valve abnormalities and to determine the type & prevalence of hemodynamic dysfunction among patients with SLE. Methods: A nested case-control study was conducted with patients with SLE selected from a longitudinal database based on having either high or low aPA titers. High & low titer groups were matched for age, gender, disease duration, and age at diagnosis. Echocardiograms were assessed for cardiac valve damage and hemodynamic dysfunction. T-tests, Chi-squared, and regression analyses were performed as appropriate. Results: No differences were found in the aortic (p=0.933), pulmonic (p=0.214), or mitral (p=0.309) valves based on aPA titer, but the high titer patients were more likely to have tricuspid valve disease (p= 0.015). Most common abnormality was regurgitation (28 cases), stenosis (4 cases), an artificial valve (2 cases), or other (5 cases). No valve thickening or vegetations

were noted. Other variables examined in a regression model included: aPA titer (OR=4.3, CI 95%= 1.3-14.4, p=0.02), African American (OR=0.9, CI 95%= 0.3-2.6, p=0.782), Gender (OR=1.7, CI 95%= 0.2-16.6, p=0.630), childhood-onset SLE (OR=0.5, CI 95%= 0.2-1.5, p=0.229), visit age greater/equal to 40 (OR=1.8, CI 95%= 0.6-5.0, p=0.283), and disease duration greater/equal to 20 years (OR=1.8, CI 95%= 0.6-5.0, p=0.283). Multivariate logistic regression, adjusted for disease duration and age, showed a significant difference between the two groups for all four valves (OR=3.05, CI 95% 1.1-8.4, p=0.03) and tricuspid valve (OR=4.4, CI 95% 1.2-16.0, p=0.03) Conclusion: High levels of anti-phospholipid antibodies correlated with the presence of valvular abnormalities among patients with SLE, most commonly tricuspid regurgitation. No difference was found between groups regarding African American ethnicity, gender, childhood-onset lupus, visit age, or disease duration. Future directions include a prospective study to examine the effect of lowering aPAs on the risk of future valvular disease. *American College of Rheumatology*

208 The Co-occurrence of Traumatic Brain Injuries and Posttraumatic Stress Disorder in a Rolling Cohort of Veterans

, Deep B Sangani[1], Leonard E Egede[2], Samir M Fakhry[3], Pamela Ferguson[3], Clara E Dismuke[4]; *[1]MUSC, [2]Medicine, MUSC, [3]Surgery, MUSC, [4]Ralph H Johnson VA Medical Center*.

This paper focuses on the association between traumatic brain injury (TBI) and posttraumatic stress disorder (PTSD). Specifically, it explores the potential protective effect of loss of consciousness and the loss of memory against PTSD. A rolling cohort of 152,309 United States Veterans from 2000 to 2010 with confirmed TBI diagnosis codes were isolated. ICD-9 codes for TBI were categorized by blunt vs. penetrating wound and alteration of consciousness. The frequency of these categories and the PTSD code were calculated, and a chi-squared test was used to access the association between PTSD diagnosis and the TBI categories. A logit model was used to examine the association of PTSD with TBI classification while adjusting for Veteran demographics, disability status and survival. Statistical significance was determined at P<.05. All analyses were performed with STATA 12 in the VA Informatics and Computing Infrastructure (VINCI). The most common TBI diagnosis was closed injuries with unknown LOC (73.02%). During the study period, PTSD was diagnosed by ICD9 code in 11.41% of Veterans. In Veterans with a closed injury and LOC <30 minutes, PTSD was diagnosed at a rate of 20.81%. After adjusting for the relevant covariates, closed TBI with LOC<30 minutes had much higher risk of PTSD (Odds Ratio 1.49, 95% CI 1.30-1.70). Other significant covariates were time with the highest risk of PTSD diagnosis in 2009, age with Veterans aged 18-35 with the highest risk of PTSD, gender with males having the highest risk of PTSD, and geography with highly rural Veterans having the highest risk of PTSD relative to urban Veterans. Veterans with any service connected disability rating also had a much higher risk of PTSD relative to Veterans who did not. The analysis of this data suggests an association with PTSD and mild TBI in Veterans. The results suggest that all Veterans diagnosed with TBI should be screened for PTSD and treated appropriately. Acknowledgements: We would like to thank the Ralph H Johnson VA Medical Center for allowing us to use their space and resources for this project. *T35 Grant*

209 In Vitro Stimulation with TGF-beta 1 Accentuates Proliferative and Migratory Properties of Murine Thoracic Aortic Aneurysmal Fibroblasts

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Introduction: Abnormal extracellular matrix (ECM) remodeling occurs with the development of thoracic aortic aneurysms (TAA). Aortic fibroblasts have been implicated in the structural pathology of TAAs and the cytokine transforming growth factor-beta 1 (TGFb1) has been shown to play an integral part in the regulation of ECM degradation and deposition with ECM remodeling. However differences in phenotype between aneurysmal and normal aortic fibroblasts in response to TGFb1 stimulation remain largely uncharacterized. Methods: Thoracic aortic fibroblasts were isolated and cultured from male C57BL/6 mice with (n=8) and without CaCl¬2 induced TAAs (n=6) to examine migration (Transwell) and proliferation (CyQuant) in the presence or absence of 10ng/mL TGFb1 (Control and Control+TGFb1 groups), and on aneurysmal fibroblasts with and without TGFb1 (TAA and TAA+TGFb1 groups). Results: Migration was increased in the TAA fibroblasts as compared to Control (135±23 vs 50±13 cells, p<0.05). Stimulation of TAA fibroblasts with TGFb1 resulted in a further increase in migration (197±18 cells vs 88±14, p<0.05); while having no effect in the migration of Control fibroblasts. Similarly proliferation was increased at 48 and 72hrs (p<0.05) in TAA fibroblasts compared to Control fibroblasts and stimulation with TGFb1 further increased proliferation of TAA fibroblasts at 48 and 72hrs (p<0.05); while having no effect on the proliferation of Control fibroblasts. Discussion: Taken together, these results demonstrate that TAA fibroblasts undergo a stable change in cellular phenotype resulting in increased migration and proliferation and a heightened response to TGFb1. The migratory and proliferative capacities of thoracic aortic fibroblasts may be important components of the cellular pathology underlying TAA development and the TGF-beta signaling pathway may play a significant role in TAA formation and progression. *2I01BX000904-04A2, VA Merit*

210 Transforming Growth Factor Beta 1 Signaling Through the Activin Receptor-Like Kinase-1 (ALK-1) Receptor: Role in the Formation of Thoracic Aortic Aneurysms

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Introduction: Thoracic aortic aneurysms (TAAs) develop as a result of abnormal remodeling of the aortic extracellular matrix (ECM). While the matrix metalloproteinases (MMPs) have been identified in mediating ECM degradation with TAAs, upstream signaling events remain unclear. Transforming growth factor- beta (TGF-beta), which can signal through multiple type-1 TGF-beta receptors, including TGF-betaR1 and ALK-1, plays a role in vascular ECM remodeling. During TAA development, response to TGF-beta signaling switches from TGF-betaR1 mediated to an ALK-1 mediated signaling pathway. This study examined whether changes in type-1 TGF-beta receptors could alter TGF-β signaling, MMP abundance and TAA formation. Methods and Results: Aortic fibroblasts (AoFb) cultures were established from wild-type C57BL/6 mice and mouse strains with targeted interruption of type-I TGF-beta receptors (TGF-betaR1+/- or ALK-1+/-) to determine the effect on modulating the TGF-beta signaling pathway. AoFb were treated with 10 ng/mL TGF-beta1 for 3 hours and collected 21 hours later to determine protein abundance for MMP-2, MMP-13, and MT1-MMP. Exposure to TGF-beta1 increased MT1-MMP in AoFbs from the TGF-betaR1+/- mice, and decreased MMP-13 in AoFBs from ALK-1+/- mice. TAAs were induced in the descending thoracic aorta and aortic diameters were measured at 2, 4, 8, and 16 weeks. Pre-TAA aortic diameters (digital microscopy; μm) were similar to littermate wild-type in TGF-betaR1+/- mice (744±52, n=44 vs 795±42, n=45), and in ALK-1+/- mice (735±22, n=48 vs. 712±46, n=42; (both p=NS). While there was no difference in the trajectory of aortic dilation in the TGF-betaR1+/- group, the change in aortic diameter over time was attenuated in the ALK-1+/- group. Conclusions: These results suggest that signaling through the ALK-1 receptor may lead to enhanced MMP production, and thereby contribute to TAA formation. Specific therapeutic strategies aimed at ALK-1 receptor inhibition may reduce or prevent the clinical progression of thoracic aortic aneurysms. *2I01BX000904-04A2 VA Merit*

211 Transaortic Coarctation (TAC) in Mouse Models

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Heart failure has become an increasingly common and complex disease process and it subsequently has been shown to have a poor prognosis as a result of its difficulty to manage. This disease is characterized by changes in the handling of calcium within myocardial cells and an overall remodeling of the ventricular chambers of the heart. In order to better understand and treat the insidious nature of the disease, pre-clinical models have been developed that mimic human heart disease. The mouse is the species of choice for heart pathology for the following reasons: 1. Availability of many transgenic and knockout lines; 2. Cost efficiency; and 3. The mouse is readily obtainable. Dr. Menick's lab and others have already shown that histone deacetylases (HDAC) can regulate the expression of the Sodium/Calcium Exchanger (NCX1), my hypothesis is that Class I and IIA HDACs play a role in NCX1 regulation in the pressure overloaded ventricle. In order to test my hypothesis I performed a transaortic coarctation, which resulted in the desired hypertrophy. Using the TAC model we demonstrated by Western blot that NCX1 expression is upregulated as a result of pressure overload. This reflects the changes that seen in a patient with congestive heart failure. Further treatment with HDAC inhibitors prevented this upregulation. The TAC procedure proved to be an effective model for mimicking the changes observed in the clinical presentation of congestive heart failure. *NIH R25 HL096316*

212 Environmental Detection of Bacillus Anthracis Spores Using 'bioluminescent' Reporter Bacteriophage

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Abstract not available.

213 Ganoderic Acid (A and DM) Inhibits Tumorigenicity of Malignant Meningiomas Via NDRG2 Overexpression

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Of all brain tumors, meningiomas are the second most common, and a small proportion of which are atypical or malignant. Effective therapies include surgery and radiation, but novel target specific drugs are needed to not only improve survival but also reduce frequent recurrence patterns. Recently, an identified N-myc downstream-regulated gene 2 (NDRG2) protein was shown to be consistently down-regulated in grade III meningiomas, demonstrating its role in tumorigenesis. We used two bioactive triterpene compounds derived from Ganoderma lucidum (ganoderic acid A and ganoderic acid DM) in a preclinical meningioma model, in order to overexpress the tumor suppressor gene NDRG2 that inhibits tumorigenic pathways and proliferation of meningiomas. Our in vitro and in vivo experiments demonstrated that NDRG2 overexpression

by ganoderic acids (A/DM) inhibits proliferation and invasion, and suppressed metastatic potential while preserving normal brain tissue. Our results strongly demonstrate the effect of the novel agent ganoderic acid (A/DM) and establish their translational potential for the treatment of patients with aggressive malignant meningiomas.

214 Prognostic Factors in Myoepithelial Carcinoma of the Major Salivary Glands

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Abstract not available.

215 The Anti-Inflammatory Effect of Resveratrol in a Murine Model of Autoimmune Hepatitis

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Objectives: Autoimmune hepatitis (AIH) is a severe form of liver disease in which the body's own immune system attacks the liver, causing long-term inflammation and liver damage. This study focuses on the effectiveness of resveratrol, a bioactive compound from red grapes, in attenuating T-cell mediated liver inflammation in mice (Concanavalin A model) by suppressing known pro-inflammatory cytokines and modulating important transcription factors. Methods: Blood plasma and serum were collected at 6, 12, 16 and 24-hour time points post-ConA administration to C57BL/6 mice (n=5). Levels of AST and ALT liver enzymes in the plasma were determined by spectrophotometric assays. Liver tissue was H&E stained, and analyzed by light microscopy for histological indications of inflammation, necrosis and cellular infiltrates. Plasma was analyzed for the presence of pro-inflammatory cytokines, TNF-α and IFN-γ, by ELISA assays. qRT-PCR was performed to quantify levels of important transcription factors in liver inflammation (SOCS 1/SOCS3, STAT1/STAT3). Flow cytometry was used to quantify the levels of apoptotic cells, CD62L+ cells, T Helper cells, MDSCs, and Tregs. Results/Conclusions: A single 5 mg/kg dose of resveratrol was found to be highly effective in vivo in attenuating acute liver inflammation induced by ConA by lowering ALT and AST levels (16 hr. time point: P=0.0024/P=0.009; AST 24 hr. time point: P=0.0068), and attenuating the accumulation of cellular infiltrates (P=0.044); 20 mg/kg and 50 mg/kg doses appeared to increase levels of inflammation. Resveratrol significantly reduced levels of pro-inflammatory cytokine, TNF-α (P=0.0029), and increased levels of SOCS1, while decreasing levels of STAT1 and STAT3. Resveratrol also appeared to boost levels of regulatory cells of the immune system (MDSCs, Tregs), while lowering levels of CD62L+ cells. Based on the efficacy of resveratrol observed in mice, it shows promise as an alternative anti-inflammatory treatment for AIH. *Magellan Scholar Grant, USC; Magellan Mini-Grant, USC; Student Undergraduate Research Fellowship, USC Honors College*

216 Effect of Coronary Artery Calcium on Outcomes in Patients Undergoing Lobectomy for Treatment of Lung Cancer

, Joseph P Bethea, James Ravenel; *Radiology, MUSC*.

Abstract not available.

217 A Biodegradable Matrix for Endothelialization of 3-Dimensional Vascular Tubes

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Three-dimensional scaffolds play an important role in vascular tissue engineering as an exogenous matrix that provides the cells with a tissue specific microenvironment and architecture. For cardiovascular applications in particular, the development of biocompatible scaffolds that can maintain their mechanical integrity while being exposed to a high-flow, low-resistance circulation is a necessary criterion. In spite of recent progress in this field, the generation of small-diameter (<6mm) vessel replacements that meet requisite biomechanical strength and stiffness, as well as biological functionality, remain two of the greatest impediments to clinical translation. The objective of this study was to evaluate the suitability of shortened poly-N-acetyl-glucosamine (sNAG) nanofibers as a novel biomaterial for the generation of patient-specific, arterial prostheses. To gain initial insights into the potential use of sNAG as an instructive vascular scaffold, endothelial cells (ECs), vascular smooth muscle cells (VSMCs) differentiated from adipose-derived stem cells (ADSCs), and fibroblasts were co-cultured in cell-aggregates in the presence of sNAG or other known effectors of vascular assembly. Immunohistological analyses revealed a strong angiogenic effect that resulted in significantly higher microvessel density when compared to control spheroids. Immunoblot analyses were performed to assess the impact of sNAG nanofibers on the synthesis of proteins associated with vascular assembly. An interesting finding of these analyses was that expression of elastin, which is not typically observed in post-natal VSMCs, was markedly increased in our sNAG-treated vascular aggregates. This increase was greatest in aggregates comprised of all three vascular cell types, highlighting the importance of cross-talk between ECs and VSMCs in stimulating the synthesis of vascular wall components that provide mechanical strength and stiffness to small diameter vascular structures. Collectively, our preliminary analyses suggest that sNAG nanofibers may provide an instructive, biocompatible matrix for the rapid assembly of vascular cell modules for the development of a tissue-engineered vascular graft (TEVG). *NSF RII EPS-0903795*

218 Determining the Binding Constants of the OAR Domain of PRRX1a with Cofactors Using the Biacore System

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The PRRX1a gene is a homeobox gene. Homeobox genes are developmental master control switches that bind DNA and regulate transcription of nearby genes. The PRRX1a gene encodes a protein that is critical in early cranio-facial development, specifically tooth, palate, and mandible morphogenesis. A single nucleotide change alters the 231st amino acid from alanine to proline (A231P), causing a birth defect known as Agnathia-otocephaly, the phenotype of which is a missing mandible, as well as skull and ear defects. This A231P mutation is found within the OAR domain of PRRX1a. The OAR domain is a highly conserved region of 14 amino acids always observed in the carboxyl region of 16 human proteins of which PRRX1a is one. Mutations or deletions of these OAR domains are involved in various diseases and malformations including diabetes mellitus and hyperplasia of the pancreas. PITX2 is one of the 16 proteins that contains an OAR domain. Past research in the laboratory of Brad Amendt has defined that DLX2, TBX1, and PIT1 all bind to the OAR domain of PITX2. We hypothesize that the OAR domains of the 15 other proteins will also interact with some or all of these cofactors, albeit with modified affinity. By using the Biacore system one can quantify the affinity between proteins and measure the dissociation as well. The following open reading frames (ORF) were cloned into the bacterial expression plasmid pFN29A: PITX2, DLX2, PIT1, TBX1, PRRX1a, and PRRX1a minus the OAR domain. This plasmid allows for expression of each of the ORF with a Histidine tag and a HaloTag (HT). Currently we are have cloned all the necessary plasmids and are in the process of purifying all the fusion proteins for introduction to the Biacore system. This will take us closer to a conclusion of the binding affinity of these proteins to their cofactors and a better understanding of how these proteins associate with each to facilitate normal cranio-facial development and how alterations may cause disease and malformations. *Summer Health Professionals Research Program*

219 Potential Management Strategies To Treat Factitious Bacteremia

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Factitious bacteremia is a rare disorder with limited medical literature, and thus there is a lack of management guidelines. Here, we describe another peculiar case of self-induced bacteremia, while reviewing previous literature and discussing the unique diagnostic and treatment challenges of this disorder. Drawing lessons from the successful treatment of our patient as well as previous patients, we propose a well-planned, compassionate confrontation of the patient as a preferred management strategy. Newly, we present a design of potential patient reactions to confrontation and an algorithm to adequately respond to those reactions.

220 First Report of a Familial Mutation in ARID1B

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Abstract not available.

221 Familial Lipomyelomeningocele: a Case Report and Genetic Analysis

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Lipomyelomeningocele, a type of spina bifida and closed neural tube defect, is a condition of neurological consequence that affects between 3 and 16 in 100,000 live births. Despite extensive research in the field of neural tube defects and folic acid supplementation, little is known about the genetic etiology of lipomyelomeningocele. In this report, we describe the first documented case of transgenerational lipomyelo-meningocele, with a father and subsequently his son born with this defect. This includes the infant's presentation, workup, and management. The genetic component of the study is comprised of a high-resolution chromosome analysis, a microarray analysis, and whole exome sequencing. The search for a gene attributable to lipomyelomeningocele pathogenesis includes querying roughly 20,000 protein-coding genes for a shared mutation related to spine development.

222 Influence of the Method of Fracture Repair on the Rate and Completeness of Bone Healing

E Lex Hanna, Yongren Wu, Robert Holmes, William Barfield, Vincent Pellegrini; *Orthopaedics, MUSC*.

Fractures heal by two different pathways, endochondral (EO) or intramembranous ossification (IO), clinically the pathway followed is determined by the nature of fracture stabilization. Our objective is to characterize the differential features of fracture healing via the EO and IO pathways in the same animal by histologic, biomechanical, and radiographic means to assess the comparative rates and completeness of fracture healing. Sprague-Dawley (SD) rats have been used to develop a bilateral femur fracture model for concurrent study of both healing pathways of bone in the same animal. One side is repaired with a dynamically locked intramedullary device while the other side is rigidly fixed with plate and screws. The morphology and microstructure of the fracture site was quantitatively assessed using micro-

CT. Femurs were harvested and slides were stained with Safranin O and Fast green for differentiation between cartilage, fibrous tissue, and bone. Histomorphometric quantification of the callus and cellular properties were assessed. The biomechanical strength of the femora were assessed using four point bending. The amount of callus formation in femurs repaired using IM nail was consistently greater than those repaired using plate fixation. Specimens fixed with plate and screws exhibited greater stiffness early but significantly less stiffness at later time-points. Tissue histomorphometry demonstrated a significant increase in overall callus size, cartilage area, and fibrous tissue in IM nailed fractures compared to fractures treated by rigid plate fixation. The biological and structural composition of healing fractures differs greatly depending on the pathway of fracture healing as determined by the selected method of fracture fixation. Fractures healing via EO demonstrate a more heterogeneous cellular milieu and biological matrix, in the form of cartilage and fibrous tissue, than those healing by an IO pathway. The biomechanical assessment of specimens from each pathway likewise demonstrates interesting differences in the kinetics of strength acquisition. *DoD W81XWH-13-1-0430*

223 National Case Log Reports for Graduating Otolaryngology Residents: An Analysis of Data Trends From 2004-2014

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Introduction: Case Log reports for graduating surgical residents are used to measure growth in training of a specialty over time, and an analysis of case log data for otolaryngology allows for residents and attending physicians in this field to better gauge their own programs compared to national normative data. Objective: Report National Case Log trends in otolaryngology for residents completing training and analyze possible influencing factors impacting changes in key indicator case numbers over time. Study Design: Data analysis from National Database Setting: Tertiary care hospital Subjects: National data set; no individual subjects Methods: National case log data for otolaryngology were obtained from the ACGME for the total procedural experience for residents completing training from 2005-2014 and consisted of cases where the resident acted as surgeon or supervisor. The total cases per resident per year were obtained and the percentage change from the baseline year of 2005 was calculated. This same process was used to generate analysis for other reported data categories. Results : Total surgical cases, cases grouped by Head and Neck, Otology, Plastics/Trauma, and General/Pediatrics, and individual key indicator cases within the above categories were reported as well as the percent change from the baseline year. Although the number of residents has increased substantially over the past decade, the total number of cases per resident as well as the case numbers per resident in all of the categories have also increased. Rates of change for the different cases in the different categories as well as the growth within MUSC will be discussed in detail. Conclusion: National operative case logs for graduating ENT seniors residents indicate changes in surgical emphasis for resident training and hopefully an increasing quality of training.

224 MicroRNA Mediated Negative Regulation of Caveolin 1 As a Biological Mechanism Driving Breast Cancer Disparities

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Introduction/Rationale In South Carolina, mortality differences between African American (AA) and non-Hispanic white (NHW) women breast cancer patients are amongst the highest in the country. Evidence suggests that the observed racial disparity exists independent of socioeconomic and standard of care issues, suggesting a potential biological factor may be involved. The loss of Caveolin-1 (Cav1) in the tumor stromal compartment has emerged as a novel biomarker for predicting poor clinical outcome in all of the most common subtypes of breast cancer, however the mechanism of Cav1 loss is unknown. We identified miR-510 as a novel oncomir and propose that its elevated expression in breast tumors results in stromal Cav1 loss and a subsequent worse outcome. Methods In this study we used luciferase, western blot and quantitative PCR analysis to study Caveolin-1 as a direct target of miR-510. We used a co-culture system to assess crosstalk between epithelial and stromal compartments in vitro and a mouse model to assess this in vivo. Results Our research shows that Cav1 is a direct target of miR-510 and that overexpression of miR-510 leads to downregulation of Cav1 protein expression, specifically in the stromal compartment. This may be racially significant as our studies also show that miR-510 levels are elevated and Cav1 levels are reduced in AA breast cancer patients compared to their NHW counterparts. Data from our in vivo studies shows that cancer-associated fibroblasts (CAFs) isolated from miR-510 expressing epithelial derived tumors lead to more aggressive tumor growth when co-injected with breast tumor epithelial cells when compared to scrambled control CAF co-injections and breast tumor epithelial cells alone. Conclusions Our results suggest that elevated miR-510 expression in breast epithelial cells leads to stromal Cav1 loss and is a mechanism driving racial disparity in breast cancer.

225 Race in the Role of DIEP Reconstruction and Its Effect on Outcomes

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The deep inferior epigastric perforator (DIEP) free flap has become a highly desired microsurgical procedure for breast reconstruction. Our research sought to retrospectively study the outcome data of high-risk African American females that underwent DIEP procedures at our institution, in the hopes of providing evidence to offer highly beneficial autologous breast reconstruction surgery. A retrospective review was completed of all female post-mastectomy patients who underwent breast reconstruction with DIEP from August 2008 to March 2012 at MUSC. Relationships between co-morbidities and complications were analyzed then compared between AA and Caucasian females. Statistical significance was set at p=0.05. 44 AA patients (mean age of 51.4 years, mean BMI of 32.1 kg/m2) underwent breast reconstruction after mastectomy using the DIEP. A total of 62 flaps were performed, with 59% of these patients being obese (BMI>30), 68% hypertensive, and 36% diabetic. Overall, 33 (75%) had post-operative complications. Three patients had total flap loss (4.8%). No partial flap losses were identified. The most common complications were wound dehiscence (27%) and clinically notable fat necrosis (25%). 95 Caucasian females (mean age of 54.7 years, mean BMI of 28.4 kg/m2) underwent breast reconstruction using the DIEP flap reconstruction. A total of 161 flaps were preformed, with 29 (30.5%) of these patients being obese (BMI>30), 36(37.9) hypertensive and 7 (7.4%) diabetic. Overall 63 patients (66.3%) had post-operative complications. Four patients had total flap loss (4.2%). There was one partial flap loss in this group. The most common complications were clinically notable fat necrosis 29(30.5%) and wound dehiscence 21 (22.1%). The DIEP is a viable option for breast reconstruction following mastectomy in high-risk AA patients. There was not a statistically significant association between common comorbidities such as diabetes, hypertension or obesity and DIEP microsurgical breast free flap complications or failures.

226 Differential Hypertensive Protease Expression In The Thoracic Versus Abdominal Aorta

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Background: Hypertension contributes to pathologic aortic remodeling and regional heterogeneity between the thoracic (TA) and abdominal aorta (AA) may be propagated by this hemodynamic stress. This study tested the hypothesis that the expression of two major protease systems, matrix metalloproteinases (MMPs) and cathepsins, are differentially regulated in the TA and the AA with hypertension. Methods: Three mouse models were employed: normotensive control (BPN/3, n=8), an induced hypertension model with BPN/3 mice and osmotic pump implantation for Angiogensin II (AngII) infusion (BPN/3+1.46mg/kg/day AngII; n=3), and a non-AngII dependent spontaneously hypertensive model (BPH/2; n=4). TA and AA aortic segments were evaluated by quantitative RT-PCR and zymography/immunoblotting for MMP-2, MMP-9, MT1-MMP, and cathepsins (S, K, and L). Groups were compared via one and two sample T-tests. Results: Following 28 days infusion, the BPN/3+AngII mice had a 17% increase in systolic blood pressure, matching that of the BPH/2 mice (both $p<0.05$ vs. control). MMP-2 mRNA levels were elevated in TA and AA in BPH/2 as well as BPN/3+AngII mice; with further elevation in the TA of BPN/3+AngII mice and concordant increase in zymographic abundance ($p<0.05$). MMP-9 mRNA was decreased in the TA of BPH/2 mice and in the AA of both experimental groups ($p<0.05$ vs. control). MT1-MMP mRNA trended higher in the TA and appeared to be reduced in the AA in both groups with hypertension. Expression of cathepsins K and L was reduced in both aortic regions of BPH/2 mice ($p<0.05$), with concordantly decreased protein abundance in the AA ($p<0.05$). However, mRNA levels of all cathepsins were increased in the TA of BPN/3+AngII mice compared to control ($p<0.05$). Conclusion: This study identified pressure-dependent and AngII-dependent regional differences in expression of MMPs and cathepsins. These findings suggest that these proteases may contribute to differences in vascular remodeling between the TA and AA with hypertension. *Society of Vascular Surgery Foundation Student Research Fellowship; Ralph H. Johnson VAMC*

227 Kallistatin Inhibits Endothelial-Mesenchymal Transition By Inhibiting MiR-21 and Oxidative Stress, and Stimulating ENOS/SIRT1 Expression

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Kallistatin through its structural elements, active site and heparin-binding domain, plays important roles in regulating differential signaling pathways and biological functions. Our previous studies showed that kallistatin gene delivery markedly inhibited organ fibrosis and tumor progression in animal models, and reduced transforming growth factor (TGF)-β-induced collagen synthesis in myofibroblasts. TGF-β is the most potent inducer of endothelial-mesenchymal transition (EndMT), which contributes to fibrosis and cancer development. Moreover, microRNA-21 (miR-21) is an important player in organ fibrosis and tumor invasion. Here, we investigated the potential role of kallistatin in suppressing EndMT via regulating TGF-β and miR-21 in endothelial cells. Recombinant human kallistatin inhibited TGF-β-induced EndMT, as evidenced by morphological changes, as well as increased endothelial and reduced mesenchymal marker levels. Kallistatin inhibited TGF-β-mediated reactive oxygen species (ROS) formation and NADPH oxidase expression and activity. Moreover, kallistatin antagonized TGF-β-induced miR-21 and Snail1 synthesis, Akt phosphorylation, NF-κB activation, and matrix

metalloproteinase 2 levels. Kallistatin via its heparin-binding site inhibited TGF-β-induced miR-21 and Snail1 expression, as well as ROS formation. Conversely, kallistatin through its active site stimulated the synthesis of antioxidant genes, endothelial nitric oxide synthase (eNOS), sirtuin 1 (SIRT1) and forkhead box O1 (FOXO1). This is the first study to demonstrate that kallistatin's heparin-binding site is crucial for blocking TGF-β-induced miR-21 and oxidative stress, while its active site is key for stimulating eNOS, SIRT1 and FOXO1 expression in endothelial cells. These findings reveal novel mechanisms of kallistatin in preventing EndMT, thus leading to protection against fibrosis and tumor development. *NIH R01 HL118516*

228 Elucidating Hunk's Role in Regulating Autophagy Through Interaction with Essential Autophagy Complexes

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Recent studies have shown that autophagy may be a potential mechanism in which HER2 positive breast cancer (HER2+ BC) cells acquire resistance to common HER2 inhibitors, thereby encouraging tumor survival and growth. HER2+ BC cells that are resistant to HER2 inhibitors often exhibit hyper-regulated autophagy, which is proposed to act as a primary survival mechanism for these cells. Our lab has previously shown that hormonally-upregulated neu-associated kinase (Hunk) is essential for HER2+ BC cell viability and that Hunk inhibition by shRNA targeting impairs autophagy in a HER2+ resistant cell line, implying that Hunk is involved in the regulation of autophagy. Our current results show that Hunk appears to co-localize with and bind to the essential autophagy protein Beclin-1 and its binding partner UVRAG, both of which are important proteins involved in the formation and maturation of the autophagosomes. In addition, we find GFP-Hunk co-localized with RFP-LC3B, a conjugated protein which signifies active autophagy prior to autophagosome-lysosomal fusion. When cells are treated with an autophagy inhibitor chloroquine, the binding between Hunk and Beclin-1 appears to be reduced, whereas formation of punctate vesicles where Hunk and LC3B co-localize appear. These results show that Hunk interacts with autophagy components at multiple stages during the autophagy process and, together with our previous observations in HER2+ BC cell models suggests that inhibiting autophagy via disruption of Hunk's interactions could be therapeutically beneficial. *NIH NCI R01 CA187305; Concern Foundation; American Cancer Society IRG-97-219-14*

229 Renal ERK1/2 Regulates PGC-1&Alpha and Mitochondrial Biogenic Homeostasis Physiologically and During Renal Injury

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Acute kidney injury (AKI) is defined as a sudden decline in kidney function and the outcomes of AKI have not changed in the past few decades. Previous studies demonstrated that persistent disruption of mitochondrial homeostasis (e.g. PGC-1&Alpha, a master regulator of mitochondrial biogenesis (MB)), is an important contributor to renal ischemia reperfusion (IR) injury and repair. While the MAPK ERK1/2 regulates numerous cell signaling pathways, the role of ERK1/2 activation in MB physiologically and within renal IR injury remains limited. Renal proximal tubule cells (RTPC) were treated with the MEK1/2 inhibitor trametinib (10nM) for various time points. Trametinib was administered 1 hour before 18 min of bilateral IR. Signaling pathways were explored using qRT-PCR, subcellular fractionation, and immunoblot analysis. Trametinib blocked ERK1/2 phosphorylation in RPTC at all time points studied. Trametinib inhibited ERK1/2 phosphorylation in vivo at 4 and 24 hr. Trametinib increased PGC-1&Alpha mRNA at 1, 4, and 24 h, as well as downstream target genes NDUFS1, NRF1, and TFAM at 1, 4, and/or 24 h. Trametinib administered to naive mice increased PGC-1&Alpha, NRF1, and TFAM mRNA at 4 h in the renal cortex and increased PGC-1&Alpha and TFAM protein. The inhibition of pERK1/2 decreases the inactive form of FOXO1 in vivo leading to the observed increase in PGC-1&Alpha transcription and downstream targets. In the IR model, pERK1/2 increased 4-fold at 1 and 3 h post IR. Increased pERK1/2 was linked to decreased mRNA levels of PGC-1&Alpha, NRF1, TFAM, and NDUFS1. Trametinib treatment attenuated suppression of mRNA PGC-1&Alpha at 3 h and increased TFAM protein 2.5-fold. ERK1/2 down regulates renal mitochondrial homeostasis under physiological conditions and ERK1/2 inhibition during renal IR promotes recovery of PGC-1&Alpha and MB, and contributes to mitochondrial recovery. These results reveal a novel target for pharmacological intervention in AKI. *NIH R01 GM084147; Department of Veterans Affairs BX-000851*

230 Interrogating the Kinetics of Panobinostat for Development of Novel HDAC Inhibitors for Synergistic Use in Multiple Myeloma

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Abstract not available.

231 Direct Effects of Nicotine Exposure on Cells of the Calvaria

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Despite the link between adverse birth outcomes of pre- and perinatal nicotine exposure, research suggests 11%

of US women continue smoking or using alternative nicotine products through the third trimester of pregnancy. The Centers for Disease Control and Prevention, National Birth Defects Study has published data suggesting maternal smoking may cause or increase the severity of craniofacial anomalies. Craniosynostosis is an extreme example of these craniofacial anomalies resulting from the premature fusion of one or more of the fibrous joints of the skull which normally allow for the growth of the expanding neurocranium. In the US, incidence of craniosynostosis is 1:1800-2500 births and often requires neurosurgery for correction. Since nicotine is a potent psychoactive drug we hypothesized that it may play a significant role in craniofacial pathogenesis. Exposing both MC3T3-E1 murine calvarial pre-osteoblast cells and primary murine calvarial suture derived cells to relevant high (25ng/ml) and low (12.5ng/ml) circulating nicotine levels resulted in differing effects by cell type on proliferation as measured by MTS, and increasing differentiation as measured by Quantitative Alkaline Phosphatase. Additionally, we were able to identify a specific nicotinic receptor, nicotinic acetylcholine receptor alpha- 7, within the calvarial sutures via immunohistochemistry ex vivo, and in cells by semi-quantitative PCR and Western Blot. Quantitative rt-PCR on control and untreated MC3T3-E1 cells showed an increase in this receptor's gene expression after exposure to nicotine in vitro. Currently it is unclear what component of cigarette smoke is causative in birth defects, however these data indicate that nicotine alone is capable of disrupting homeostasis within the murine calvarial suture. As nicotine crosses the placenta and concentrates in fetal tissue, new nicotine delivery technology (i.e. e-cigarettes) have the potential to be the next public health crisis in birth defect research. *NIH/NCATS UL1 TR000062, NIH/NIGM P30 GM103331, NIH/NIDCR T32 DE017551*

232 Bayesian Statistical Inference on Small Samples

, Peter Greene, Caitlyn Ellerbe; *Public Health, MUSC*. **Abstract not available.**

233 BCTS: A Python Module to Perform Bayesian Clinical Trial Simulation

, Zhenning Yu, Caitlyn Ellerbe, Viswanathan Ramakrishnan; *Biostatistics-Public Health Sciences, MUSC*.

Abstract not available.

234 Ceramide Mediated Lethal Mitophagy: A Novel Cell Death Mechanism in FLT3 Targeted Therapy of Acute Myeloid Leukemia

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Mutations in FLT3 receptor tyrosine kinase are common in Acute Myeloid Leukemia (AML) and confer a worse prognosis. Ceramide, a bioactive sphingolipid, is synthesized de novo by Ceramide Synthases (CerS) and mediates cancer cell death in response to various chemotherapeutic agents. This study investigates the biological role of ceramide lipid in the response of AML to FLT3 targeted therapy. We show that AML cell lines and patient samples expressing FLT3 have suppressed CerS1 expression and lower levels of its product C18-ceramide compared with FLT3 negative AML cells. Silenced FLT3 expression or its pharmacological inhibition increased CerS1 and C18-ceramide levels while FLT3 overexpression suppressed them. The increase in C18-ceramide after FLT3 inhibition is required for cell death as silencing CerS1 expression or inhibiting its enzymatic activity protected from FLT3 inhibitors-induced cell death. Targeting FLT3 resulted in C18-ceramide dependent mitophagy, as determined by increased LC3B-II levels and formation of autophagosomes around mitochondria. Mechan-istically, C18-ceramide accumulated in the mitochondria to bind directly to LC3B-II recruiting autophagosomal membranes for the execution of mitophagy. This process is regulated upstream by early dephosphorylation, activation, and translocation of DRP-1 to mitochondria. Exogenous C18-pyridinium-ceramide (LCL-461) accumulated selectively in mitochondria and was able to induce cell death in cells sensitive or resistant to FLT3 targeted therapy, through the same mechanism of LC3B-II dependent lethal mitophagy. This highlights the potential of C18-pyridinium-ceramide as an alternative therapeutic agent for AML patients regardless of whether patients are sensitive or resistant to FLT3 targeted therapy. In summary, our novel study is the first to highlight the importance of ceramide metabolism in AML oncogenesis by showing that FLT3 suppresses CerS1 expression and ceramide generation while its inhibition reactivates CerS1/C18-ceramide axis leading to lethal mitophagy and AML cell death. *NIH R01 CA088932; R01 DE016572; R01 CA173687*

235 Comparative Effectiveness Approach to Investigating the Relationship of Physical Activity and Post-Stroke Depression in Community Dwelling Adults

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Introduction: In contrast with randomized clinical trials, observational studies may not measure the true effects of treatment exposure between treated and control groups due to unbalanced confounders. This study identified optimal physical activity (PA) levels recommended by the American Health Association that intend to reduce the risk of depression after stroke, using comparative effectiveness, quasi-experimental propensity score (PS) matching. Methods: Community dwelling adults (n=4555) who reported having had a

stroke were extracted from the 2013 Korean Community Health Survey. They were asked questions about depression, physical activities (moderate and vigorous-intensity), and chronic conditions. Multiple regression modeling and PS methods were used to estimate the effects of PA on reducing the risk of depression. Three methods were compared, including; 1) multivariable regression model, 2) Inverse Probability Weighting Adjustment, and 3) Greedy Algorithms with 1:1 matching. The dependent variable was diagnosis of depression, and the primary independent variable was moderate and vigorous PA. Baseline covariates were ten demographic and nine chronic condition variable. Results: Without PS methods, there were significant differences in baseline covariates (15 out of 19, $p < 0.05$) between people who performed PA and those who did not perform PA. After controlling for covariates, the covariates were similar in the two groups (all $p > 0.1$). Moderate PA significantly reduced the risk of acute (OR, 0.610-0.631, $p < 0.01$) and chronic depression (OR, 0.693-0.703, $p < 0.01$). However, vigorous PA did not reduce the risk of acute and chronic depression (OR, 0.740-1.307, $p > 0.1783$; 0.927-1.287, $p > 0.3926$). Conclusion: The findings suggest that moderate PA can significantly reduce the risk of depression for people with post-stroke depression. The lack of an effect of vigorous PA may have been a function of the decreased physical capacity of post-stroke patients and therefore small sample associated with this group. *KCDC 2013-06EXP-01-3C*

236 Hospital Readmissions for Stroke Patients with PEG Feeding Tubes: An Analysis of HCUP SID Florida 2012

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Background and Purpose:Reducing hospital readmissions to improve patient care and avoid monetary penalties is a crucial mission of acute care hospitals. Receiving a PEG feeding tube post-stroke may indicate greater severity and, therefore, a higher risk for readmissions. For patients with and without PEG tubes, we investigated: (1) 30- and 60–day readmission rates, (2) readmissions per discharge destination, and (3) primary diagnoses for 30-day readmissions and (4) built a prediction model for 30-day readmissions. Methods: We conducted a retrospective analysis of archival hospital billing data with the Healthcare Cost and Utilization Project Florida State Inpatient Database from 2012. We used univariate analyses to determine 30- and 60-day readmission rates, 30-day readmission rates per discharge destination and the five most frequent primary readmission diagnoses. We used logistic regression analysis to build a prediction model for 30-day readmissions. Results: In total, we analyzed 29,626 discharge records. Within 30 days after discharge 21.06% of stroke patients with and 10.85% without PEG tube placement were rehospitalized. 54.26% of stroke patients with a PEG tube placement were discharged to skilled nursing facilities and 27.56% of these patients were rehospitalized within 30 days. Septicemia was the most frequent primary readmission diagnosis (for 17.52% of all readmitted stroke patients with a PEG tube placement). Comorbidities, hospital characteristics (stroke volume, average length of stay, volume of weekend admission), and discharge destination were predictive for 30-day readmissions. Conclusion: Stroke patients with a PEG tube placement during their index hospital stay are twice as likely to be readmitted within 30 days compared to stroke patients without PEG tubes. For some patients their primary readmission diagnosis was directly linked to PEG tube complications. The results of our study can be used to target readmission prevention strategies for this vulnerable patient group.

237 Fine-Tuning Complement After Cerebral Ischemic Reperfusion Injury Using Site-Targeted Alternative Pathway Inhibition

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Abstract not available.

238 Cocaine-Induced Activation of the STEP Phosphatase in the Dorsomedial Prefrontal Cortex of Rats During Early Withdrawal Facilitates Relapse to Cocaine-Seeking

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Cocaine addiction remains a prominent public health concern and relapse is a major clinical obstacle. Previously our lab has shown that cocaine self-administration (SA) in rats induces the dephosphorylation of Extracellular Signal-Regulated Kinase (ERK1/2), downstream transcription factor cAMP-response element binding protein (CREB), as well as GluN2A- and GluN2B- containing NMDA receptors within the dorsomedial prefrontal cortex (dmPFC) two hours after the final SA session (early withdrawal). A single intra-dmPFC microinfusion of Brain-Derived Neurotrophic Factor (BDNF) immediately after the final SA session suppresses relapse to drug-seeking for at least 3 weeks by reversing this cocaine-induced phosphoprotein depression in the dmPFC during early withdrawal, suggesting early withdrawal to be a critical timepoint for relapse prevention. ERK1/2 and NMDA receptor phosphorylation is regulated by the STriatal-Enriched tyrosine Phosphatase (STEP), which our lab has shown to be activated in the dmPFC during early withdrawal. Thus we hypothesized that systemic injections or intra-dmPFC microinfusions of the STEP inhibitor, TC-2153, immediately after SA will suppress relapse to drug-seeking following abstinence. Rats were implanted with intra-jugular catheters and bilateral intra-dmPFC guide cannulae. Following recovery, rats were

trained to self-administer cocaine for 12-14 days (2 hr/day). Immediately after the final SA session, rats were injected (i.p) or their dmPFC was infused with the STEP inhibitor TC-2153, followed by 6 days of homecage abstinence, a post-abstinence relapse test, extinction training, a cue-induced reinstatement test, further extinction, and a cocaine prime-induced reinstatement test. Results show that systemic TC-2153 suppressed cocaine prime-induced reinstatement, but not post-abstinence relapse or cue-induced reinstatement. However, intra-dmPFC TC-2153 microinfusions suppressed cue-induced reinstatement, with a strong trend towards a suppression of context-induced relapse as well as cocaine prime-induced reinstatement. These results suggest that intervention with TC-2153 immediately after SA differentially suppresses relapse to cocaine-seeking depending on the route of administration. *NIH R01 DA033479; T32 DA007288*

239 Development and Age-Related Degeneration of the Nodes of Ranvier in Mouse Auditory Nerve

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Background: Canonical nodal segments are essential for conduction, but their roles in hearing onset and maintenance of auditory function remain to be determined. Mouse auditory nerve refines and matures during early postnatal development, with hearing onset occurring at postnatal (P) days 10-12. Auditory brainstem responses (ABR) continue to improve beyond P14, reaching thresholds near those of young-adult mice with developed hearing function. Age-related nodal alterations in mouse strains displaying age-related hearing loss (ARHL) also require investigation. We examined relationships between molecular and structural maturation of nodes of Ranvier and hearing onset, and age-related nodal segment abnormalities and ARHL. Methods: Microarray analysis was performed on total RNA samples from CBA/CaJ auditory nerve at P0, 3, 7, 10, 14, and 21. Nodal function-related genes were assembled via Gene Ontology Database and evaluated using dChip. Immunohistochemical and ultrastructural characteristics of nodal segments were examined and correlated with ABR measurements in postnatal, young-adult, and aged mice. Results: Node-related genes exhibited temporal expression patterns during development, distinguishing nodal segment identities and complementing hearing onset. Nodal Nrcam and paranodal contactin were fully assembled at P10, whereas Nav1.6, the sodium channel implicated in mature node conduction, showed robust expression by P14, correlating with hearing onset and gains in ABR. Nodal structures were intact and well-organized in young-adult mice. In aged mice, there was decreased presence of intact nodes, as disruptions of the node-paranode structure were common. Node dimension measurements show a trend towards node of Ranvier elongation in aging compared to young-adult. Aged auditory nerve ultrastructure revealed disorganization of paranodal loops. Conclusions: Specific nodal segments form at different periods during development encompassing the period of hearing onset. Integrity and organization of nodal segments appear to deteriorate with age. Correlational analysis between pathological alterations of nodal segments and age-related auditory function declines are ongoing. *NIH R01 DC7506, NIH P50 DC0422, NIH R25 GM072643*

240 NAD+ Levels in Astrocytes Modulate Motor Neuron Survival in a Model of ALS

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Nicotinamide adenine dinucleotide (NAD+) is an essential electron carrier and a key molecule for signaling pathways. Reduced levels of NAD+ can lead to cellular dysfunction, which has been implicated in many health problems ranging from cancer to neurodegenerative diseases. Amyotrophic lateral sclerosis (ALS) is characterized by the degeneration of motor neurons, leading to paralysis and death. It is the most common motor neuron disease in adults, however the mechanism remains unknown and currently there are no treatment options. To study this disease, our lab uses a transgenic mouse model that overexpresses a mutant human superoxide dismutase 1 (hSOD1) gene. This mutation, which changes a glycine to an alanine at position 93, G93A, causes a toxic gain of function and lead to the development of ALS-like symptoms. Mutant hSOD1 toxicity is non-cell autonomous and motor neuron degeneration requires dysfunction of non-neuronal cells. Our lab has shown that co-cultures of wild type (WT) motor neurons plated on top of G93A astrocytes show significant decrease in survival. Treatment with NAD+ precursors confers astrocytes increased resistance against hydrogen peroxide toxicity. Here, we show two different ways to increase NAD+: one via direct supplementation with NAD+ precursors or by increasing the activity of the rate-limiting enzyme in the NAD+ salvage pathway, nicotinamide phosphoribosyltransferase (NAMPT). Both approaches cause an increase NAD+ levels, and G93A astrocytes, either transfected or supplemented, do not show the toxic phenotype in co-culture. Taken together, our results suggest that enhancing NAD+ availability in astrocytes could be a potential therapeutic target for ALS.

241 Development, Safety, and Tolerability of Transcutaneous Auricular Vagus Nerve Stimulation (taVNS), A Novel Form of Noninvasive Vagus Nerve Stimulation

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Background: Cervically implanted vagus nerve stimulation (VNS) is a FDA-approved treatment for epilepsy and major depressive disorder. Additionally, VNS has been used in numerous animal studies, with applications ranging from attenuation of inflammatory response, increased survival rate in heart failure, reduction of infarct size in cerebral ischemia, motor rehabilitation post-stroke, and tinnitus. We have developed a noninvasive form of vagus nerve stimulation called transcutaneous auricular vagus nerve stimulation (taVNS), which electrically stimulates the auricular branch of the vagus. Methods: This single-blind, sham controlled, crossover study consisted of 2 separate visits during which custom built ear clip electrodes were used to deliver direct electrical stimulation via a constant current stimulator to either the left tragus (active) or left earlobe (sham) in 15 healthy participants. Participants received nine different randomized stimulation parameters of varying pulse width and frequency. Current strength was delivered at 200% perceptual threshold. Painfulness was rated from 0 (no pain) -10 (extreme pain) on a visual analog scale (VAS) following stimulation periods. Heart rate, skin temperature, and skin conductance was recorded during the entire visit and were monitored for both minor (skin discomfort, irritation, headache, dizziness, facial pain) and major (dramatic drops in heart rate) adverse events. Results: No minor or major adverse events were reported or observed in any subjects as well as no significant decrease in heart rate was found between active and sham stimulation when an overall group analysis was conducted for all stimulation periods. Differences between active and sham stimulation for physiological recordings were found when separated into specific stimulation parameter groups. This parameter-dependent heart rate, skin conductance, and skin temperature data as well as a complex parametric time course statistical analysis will be presented. Conclusion: This study provides the foundation for taVNS to be considered a safe and feasible form of noninvasive brain stimulation. *MUSC Brain Stimulation Division*

242 The Toxicity Score Elicitation Method: A Statistical Approach to Constructing Continuous Toxicity Scores for Multiple Toxicities in Phase-I Oncology Clinical Trials

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Most dose-finding/phase I cancer clinical trials aim to find the highest dose of an experimental treatment deemed safe for patients. Patient outcomes are based on observed toxicities, conventionally assessed by a simplified binary outcome – dose-limiting toxicity or no dose-limiting toxicity. The traditional outcome may be inadequate, treating low to moderate grade toxicities as irrelevant, and ignoring potentially harmful combinations of multiple toxicity types. This is made apparent by modern cancer treatments bringing about increasingly complex patient toxicity profiles, for which the simplified outcome leads to an insufficient characterization of the toxicity burden experienced by patients. A few methods have proposed utilizing a composite, continuous toxicity score that accounts for all observed levels of severity for all possible toxicity types observed in a patient. However, devising a toxicity scoring system can be a burdensome process, generally relying on subjective interpretation by clinicians and trial and error. Furthermore, resulting toxicity scores are not easily interpretable in clinical settings. In light of this, we have developed in a statistical framework, an objective method to elicit a toxicity scoring system to be used by clinical investigators, named the Toxicity Score Elicitation Method (TSEM). The TSEM eases the process for clinicians to develop toxicity scores, while producing a consistent and accurate toxicity scoring scheme grounded by mathematics and a practical setting of decision-making rather than subjective reasoning based on an abstract framework. Given a set of toxicity types hypothesized to occur in a trial, the TSEM yields a framework to calculate a score for any possible toxicity profile, which then by design, relates back to an easily interpretable clinical outcome. To facilitate the TSEMs ease of use for clinicians, we have developed a point-and-click computer app that implements the TSEM algorithm in the background, while providing real-time updates of the toxicity scoring system being generated.

243 Classification and Regression Tree Modeling of Binary Outcomes for Datasets with Repeated Measurements

Jaime L Speiser, Valerie Durkalski, Bethany Wolf, Dongjun Chung; *Public Health Sciences, MUSC*.

Abstract not available.

244 Cilia and Their Function in Valve Development and Disease

Toomer A Katelynn, Sauls Kimberly, Johnson Amanda, Williams Katherine, Norris Russell; *MUSC*.

Abstract not available.

245 Evaluating the Performance of Bayesian and Frequentist Design in Phase 3 Clinical Trial with Dichotomous Outcome

Jiang Yunyun, Durkalski L Valerie, Zhao Wenle; *Public Health Sciences,MUSC*.

Abstract not available.

246 The Association Between Family History of Skin Cancer and Risk of Other Malignancies and Death

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Introduction: For unknown reasons, those with a personal history of non-melanoma skin cancer (NMSC) have an increased risk of developing non-cutaneous malignancies. To test the hypothesis that genetic susceptibility to cancer is a contributory factor to the excess cancer risk experienced by NMSC patients, this study examined the association between a family history of NMSC and other cancers and risk for developing a non-skin cancer and mortality. Methods: Using data from the nationally representative cohort NHEFS patients were monitored from 1982 to 1992 for cancer incidence and mortality. Patients were categorized according to their family history of cancer: cancer-free comparison group (N=3367), NMSC only(N=289), Only non-skin cancer(N=4032), and skin and non-skin cancers(N=345). All models were adjusted for age, gender, smoking history, and personal history of cancer. Results: Compared to patients with no family history of cancer, having a positive family history of skin cancer was strongly associated with increased mortality(RR: 3.7; 95% CI: 1.3-10.6) but not increased risk for developing non-skin cancer(RR 0.4, 95% CI: 0.08-1.6). Conversely, patients with a family history of skin and non-skin cancer did not experience increased risk for mortality (RR 0.7, 95% CI: 0.3-2.0) but did experience increased risk for developing a non-skin cancer (RR 3.6, 95% CI: 1.6-8.3). Conclusions: The strong association between a family history of NMSC and mortality supports prior studies showing an increased risk for mortality after a personal history of skin cancer that may be inherited. Additionally the elevated cancer risk experienced by patients with a family history of both skin and non-skin cancer further suggests skin cancer may be a sign of a hereditary condition increasing cancer risk. Unexpectedly a family history of skin cancer seems to increase different risks depending on a family history of non-skin cancer, suggesting a more complex effect than originally hypothesized.

247 Mechanism and Role of CD24 in Oral Cancer Oncogenesis and Inflammation

, Caroline Wallace Fugle[1], Yongliang Zhang[1], Feng Hong[1], Hong Yu[2], Shaoli Sun[3], Keith Kirkwood[2], Bei Liu[1], Zihai Li[1]; *[1]Microbiology & Immunology, MUSC, [2]Oral Health Sciences, MUSC, [3]Pathology & Laboratory Medicine, MUSC*.

Abstract not available.

248 Platelet-intrinsic GARP in TGFbeta Biology and Cancer Immunotherapy

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Abstract not available.

249 Speech Recognition in Realistic Listening Environments: Connecting Fragments of Speech Across Time

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In daily life, speech communication occurs in complex environments where background sounds fluctuate and conceal portions of the intended message. Listeners use slow modulations in amplitude to track audible fragments of speech across gaps of missing information. Whereas younger adults perform these challenging tasks well and with little effort, older adults are known to experience significant difficulty, particularly in the presence of other talkers. Poorer speech recognition in realistic listening environments by older adults may be attributed, in part, to age-related declines in the ability to group together fragments of speech and fill in missing information. To test this hypothesis, younger and older adults with normal hearing listened to target sentences that were periodically interrupted by silence, or by a fluctuating noise that had the same temporal pattern of the missing speech segment. Target sentences were presented either alone, or mixed with a different talker saying different sentences; in the latter case, performance is reduced, in part, because temporal modulations of the target sentence are confused with modulations from the competing talker. All participants completed a battery of auditory and cognitive tasks to determine sources of individual differences in speech recognition. Relative to sentences interrupted by silence, both younger and older adults benefited from the continuous source of modulation provided by the fluctuating noise. However, recognition of sentences interrupted by silence was poorer for older adults than younger adults, suggesting an age-related decline in the ability to track discontinuous temporal cues in speech. The addition of a single competing talker resulted in poorer performance for both younger and older adults, but did not reduce the benefit of providing continuous temporal cues with fluctuating noise. Correlations among speech measures and cognitive abilities indicate that attention, memory, processing speed, and linguistic closure each play a unique role in recognition of fragmented sentences. *NIH/NIDCD; AAA Student Investigator Research Grant*

250 Role of the Hematopoietic Stem Cell During Osteogenesis and Fracture Repair

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Mesenchymal stem cells (MSC) have been the “gold standard” for cell-based fracture treatment. However, multiple MSC-based trials have been hampered by low engraftment rates and an inability to effectively isolate this population. Our studies and others suggest hematopoietic stem cells (HSCs) may also contribute to the osteogenic lineage. Using a single cell-based

transplantation model, we showed the HSC gives rise to osteoblasts, osteocytes, and hypertrophic chondrocytes during non-stabilized fracture repair. We hypothesize that HSC-derived cells can be exploited to enhance fracture repair. In vitro assays were conducted to identify factors to promote HSC-derived osteogenesis. Mineralized colonies formed during osteogenic culture of CD45+ BM cells. Exogenous BMP-2 and BMP-9 had a synergistic effect on mineralization. Studies are ongoing to determine whether Igf-2 given in combination with BMP-2/-9 could further enhance mineralization and to determine which subset of CD45+ BM cells undergoes osteogenesis. We also sought to determine if HSC-derived osteogenic precursors (CD34+OCN+) could be mobilized from the BM and found that 3-day AMD3100 delivery, a CXCR4 antagonist, resulted in a 2-fold increase in circulating CD34+OCN+ cells. We are currently defining the optimal treatment time to increase the number of circulating CD34+OCN+ cells after fracture. Our ultimate goal is to test the functional impact of HSC mobilization and/or delivery of pro-osteogenic factors in both non-stabilized and atrophic non-union fracture models. Towards this, we are surgically generating an in vivo murine model of segmental defect atrophic non-union. Preliminary X-ray and micro-CT analyses are underway to confirm atrophic non-union. Fractured animals will then be randomized to control (no intervention) or experimental (+/-BMP/Igf-2, +/-AMD3100, +BMP/Igf-2/AMD3100) groups and temporal healing assessed and correlated to HSC-derived osteogenesis. Given that the HSC is an earlier, more easily mobilized, and better-defined stem cell than the MSC, it may prove a more efficacious therapy for treating “difficult to heal” fractures. *Dept of Veterans Affairs BX000333; NIH P30 CA138313*

251 Macrophage-mediated Phagocytosis of the Auditory Nerve Contributes to Hearing Onset in the Developing Mouse Cochlea

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In the central nervous system, phagocytes, such as microglia and macrophages, are involved in the pruning of weakened nerve fibers and synapses. Refinement of the auditory nerve during development is necessary for achieving proper hair cell-auditory nerve connectivity and auditory function. In the mouse, auditory nerve refinement occurs during the first postnatal week, before the onset of hearing function; however, mechanisms underlying auditory nerve refinement are not well understood. Here, we investigate the macrophage-associated cellular mechanism of refinement in the developing mouse cochlea. We hypothesize that macrophage-dependent phagocytosis of excessive fibers and glial cells are required for auditory nerve refinement. CBA/CaJ cochleae, collected at postnatal day (P) 0, 3, 7, 14, and 21, were used to address this hypothesis. Immunohistochemical analysis revealed that macrophages show dynamic changes in abundance during auditory nerve development, with the highest macrophage density occurring at P7. This peak in macrophage spatiotemporal density corresponds with the initiation of spiral ganglion nerve fiber refinement. Analysis of microarray data for postnatal auditory nerve samples identified over 1200 genes that are differentially expressed between P0 and P7. Review of biological functions for these genes showed that peak expression for some immune-related genes, including major histocompatibility complexes, coincided with the peak of macrophage density. Temporal expression profiles for these genes were validated using quantitative RT-PCR. 3D confocal image analysis indicated that macrophages are in close contact with and engulf nerve fibers and auditory glia during this period of nerve refinement. Diminishing macrophage activity using the pharmacological inhibitor, minocycline, caused a significant increase in auditory glia numbers, suggesting that macrophages are necessary for the elimination of excessive glia. Physiological tests of minocycline-treated mice revealed that hearing onset was delayed following macrophage inhibition. Our results suggest a novel role for macrophages in auditory nerve refinement and hearing onset. *NIH R01 DC7506, P50 DC0422, GM103342, GM103499, R25 GM072643 and the American Federation for Aging Research*

252 Evaluating the Combination of Obesity and Diabetes on Death Following an Ischemic Stroke

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Abstract not available.

253 Thoracic Aortic Smooth Muscle Cell Phenotype and Contractility Are Altered with Aging

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Background: The thoracic aorta undergoes multiple structural and cellular changes with aging that can adversely impact normal mechanical function. Specifically, increased aortic diameter and wall thickness in old mice were associated with reductions in ex vivo compliance and peak force generation. Smooth muscle cells (SMCs) are the most numerous cells of the aortic wall. The interaction between SMCs and the extracellular matrix is mediated through components of the focal adhesion complex, including integrins, talin, and integrin-linked kinase (ILK), which likely contribute to the transduction of mechanical signals. Accordingly, this study examined whether age-dependent changes in SMC phenotype result in the altered abundance of mechanotransduction proteins and cellular contractility. Methods/Results: Primary SMCs were cultured from

thoracic aortic explants harvested from 6 month and 21 month old C57BL/6 mice. Cellular phenotype was defined by proliferation, migration, adhesion, gene expression, and collagen gel contraction. Proliferation (Cyquant assay), migration (Boyden chamber), and adhesion (on cell culture treated surface) were reduced in the SMCs from old mice compared to those from young mice. SMC contractility was defined as the reduction in area of a collagen disk in the presence of a matrix metalloproteinase inhibitor (GM6001). Collagen disk contraction was impaired in aortic SMCs from the old mice relative to those from young mice. Protein abundance (immunoblotting) of mechanotransduction proteins (beta3 integrin, talin, and ILK) were increased in SMCs from old mice relative to those from young mice. Conclusions: The unique findings of this study demonstrated a disconnect between age-dependent changes in SMC phenotype and increased abundance of mechanotransduction proteins, suggesting an impairment in mechanosensing in the aorta with age. *NIH R01 AG036954; VA 2I01BX000904-04A2*

254 MicroRNA-133a Regulates Aortic Fibroblast Phenotype and Thoracic Aortic Aneurysm Formation

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Background: Thoracic aortic aneurysms (TAAs) are associated with the degradation of the aortic extracellular matrix, increased membrane type-1 matrix metalloproteinase (MT1-MMP), and altered aortic fibroblast phenotype. TAA development is attenuated in mice deficient in MT1-MMP. The microRNAs regulate translation by the formation of specific ribonucleoprotein:mRNA complexes. In clinical samples, abundance of microRNA-133a (miR133a), which directly regulates MT1-MMP translation, was inversely related to aortic dilatation. Accordingly, this study sought to determine miR133a's role in mediating aortic fibroblast phenotype and TAA formation. Methods/Results: Cellular phenotype, defined by adhesion, proliferation, migration, and MT1-MMP abundance, was examined in isolated aortic fibroblasts from mice without (control; n=4) and with TAAs (3 weeks, 0.5M CaCl2 application, 15 minutes; n=4). Compared to control, TAA fibroblasts had decreased adhesion (16.07±1.19 vs. 13.52±1.12 RFU, $p<0.05$), and increased proliferation (84.16±3.08 vs. 166.06±25.95 RFU, $p<0.05$), migration (38±2 vs. 71±3 cells, $p<0.05$), and MT1-MMP abundance (2.9±0.8 vs. 8.0±0.84 arbitrary units, $p<0.05$). Importantly, transfection of a miR-133a mimic attenuated the TAA dependent changes in fibroblast phenotype. TAAs were induced in FVB mice followed by a single tail vein injection of either saline (control, n=6) or a miR133a containing lentivirus (n=4). Systemic delivery resulted in increased miR133a in the plasma and aortic tissue, and resulted in an attenuation of TAA development when compared to control (17±1% vs. 38±2%, $p<0.05$). Conclusion: The unique findings of this study are 2-fold: Re-introduction of miR133a in aortic fibroblasts from mice restored phenotypic properties and, most importantly, in vivo augmentation of miR133a levels attenuated the development of TAA. Taken together, these findings suggest that miR133a plays a mechanistic role, at least in part, in aortic fibroblast phenotype and TAA development. *VA Merit Award IO1BX000904-02, MUSC COM Bridge Funding*

255 HPV16-E7 Enhances Ceramide-Mediated Lethal Mitophagy By Regulating the Rb/E2F5/Drp1 Signaling Axis

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Abstract not available.

256 Formoterol Induces Renal Mitochondrial Biogenesis Through Gβγ-dependent Signaling

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Acute kidney injury (AKI) occurs commonly in hospitalized patients and carries a high morbidity and mortality with no treatments beyond renal replacement therapy. AKI is characterized by mitochondrial dysfunction, particularly in the renal proximal tubule cells (RPTC). The induction of mitochondrial biogenesis (MB) is a a therapeutic target for AKI. Our group has shown that formoterol, a β2-adrenoceptor agonist, can induce MB in vitro and in vivo, and stimulate recovery of mitochondrial and renal function following AKI in mice. However, the signaling events leading to formoterol-induced MB remain unknown. Rabbit RPTC were treated with 30 nM formoterol following pretreatment with DMSO, 100 nM gallein, 10 uM L-NAME, or 100 nM MK2206 for 30 min. Oxygen consumption rates (OCR) were measured using the Seahorse XF-96 analyzer. Formoterol was found to increase Akt phosphorylation in RPTC at 30 min, and this increase was attenuated by pretreatment with the Gβγ inhibitor gallein. Pretreatment of RPTC with gallein also attenuated formoterol-induced increases in FCCP-uncoupled oxygen consumption rate (FCCP-OCR), a biomarker of MB. The phosphorylation of Akt's downstream target eNOS was measured following formoterol treatment with and without the Akt inhibitor MK2206 (100 nM). Formoterol increased eNOS phosphorylation at 1 hour, and this increase was attenuated by pretreatment with MK2206. Additionally, treatment with the NOS-inhibitor L-NAME attenuated formoterol-induced increases in FCCP-OCR. These results show that formoterol induces MB through a Gβγ-Akt-eNOS-dependent pathway. This study is the first to associate Gβγ signaling with β2 -adrenoceptor induced MB. *NIH R01 GM084147; F30 DK104550; VA BX-000851*

257 Ubiquitination Mediates Arrestin Conformational Signature and Function Following Angiotensin Receptor Activation

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Arrestins regulate several facets of GPCR signaling. GPCR-bound arrestin recruits endocytotic machinery, resulting in removal of GPCRs from the plasma membrane. GPCR-arrestin complex stability is resultant of receptor subtype, arrestin post-translational modification, and activating ligand. We have developed a panel of arrestin3 intramolecular BRET biosensors that allow observation of proximity changes between the N-terminus and six positions throughout arrestin3. Collectively, these values represent an arrestin3 conformational signature for a given set of conditions measured in a live cell, real time, multiwell plate format. Using a panel of angiotensin type 1A receptor (AT1AR) ligands, we have shown that GPCR-arrestin complex avidity correlates directly with changes in the BRET value for one of the conformational biosensors. Arrestin posttranslational modification following receptor activation influences GPCR-arrestin complex stability. We hypothesized that changes in the ability of arrestin to form stable GPCR-arrestin complexes would be reflected by loss of conformational shifts of arrestin characteristic of stable complex formation. Ubiquitination of arrestin at lysines 11 and 12 is necessary for stable GPCR-arrestin complex formation following activation through AT1ARs but not arginine vasopressin type 2 receptors (V2R). Mutation of two arrestin3 ubiquitination sites resulted in changes of the trafficking pattern observed by confocal microscopy and conformational shifts observed by intramolecular BRET in cells activated through the AT1AR. Activation by V2R, however, was unaffected by the mutations. Additionally, we tested the impact of the ubiquitination site mutation on two previously unstudied receptors, the bradykinin receptor B2 (B2R) and the parathyroid hormone 1 receptor (PTH1R). Mutation resulted in a loss arrestin conformational shifts downsteam of B2R activation but not downsteam of PTH1R activation. Examination of arrestin trafficking by confocal microscopy again determined that arrestin3 conformational signature predicts either stable or transient arrestin3 trafficking. Taken together, we conclude that arrestin conformational shifts, observable through intramolecular BRET, reflect GPCR-arrestin complex avidity.

258 An Assessment of Phthalate Exposure in Pregnant Women From Charleston, SC

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Endocrine disrupting compounds (EDCs) are substances that alter normal functioning of the endocrine system. Phthalates, compounds commonly found in PVC plastics, food packaging, and personal care products, are known endocrine disruptors. Ubiquitous in the environment but metabolized rapidly, phthalates are considered to be pseudo-persistent. In the U.S., 99 - 100% of pregnant women have detectable levels of phthalates (Woodruff et al., 2011), which raises concern over their effects during fetal development. Some phthalates are anti-androgenic and exposure in utero leads to abnormal sexual development in male rodents (Gray et al., 2000). Recent studies support the hypothesis that prenatal phthalate exposure at environmental levels can adversely affect male reproductive development in humans as well (Swan et al., 2005). Here, we sampled urine from a population of over 400 women at three time points across pregnancy and examined eight phthalate monoester metabolites: MBP, MBzP, MEHP, MEHHP, MEOHP, MEP, MiBP, and MMP. Phthalate metabolites were detected in all maternal urine samples. On average, concentrations of MEP were highest (median = 46.9 [130-308] ng/ml), and concentrations of MMP were lowest (median = 2.5 [2-8] ng/ml). We observed a significant positive correlation ($p < .01$) between maternal BMI for all phthalate metabolites except MEHP. In addition, phthalate concentrations were significantly higher ($p < .01$) in African American women than in Caucasians, yet both groups exhibited similar phthalate metabolism patterns. Within individuals, there was no difference between phthalate concentrations in the second and third trimesters, but concentrations of five of the eight metabolites were significantly higher at time of delivery ($p < .01$). Our results indicate that infants of African American mothers or mothers with increasing BMI are at higher risk of prenatal phthalate exposure and that hospitalization for delivery maybe an acute source of phthalate exposure for pregnant women.

259 Targeting the Alternative Pathway of Complement to Improve Functional Recovery After Spinal Cord Injury

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Following injury to the spinal cord, a post-traumatic inflammatory response occurs which is thought to play an important role in secondary neuronal injury and the impairment of functional recovery. The complement system appears to play an important role in post-traumatic inflammation and the progressive degenerative events that take place. There are three pathways of complement activation; the classical, lectin and alternative pathways. Using complement deficient mice, we previously demonstrated that the alternative pathway

plays a key role in driving secondary injury after SCI. Therefore, in this study we investigated the role of the alternative pathway in a clinically relevant paradigm using an alternative pathway specific inhibitor, factor H (fH). We utilized a site-targeting strategy by linking fH to a fragment of complement receptor 2 (CR2) that binds to complement C3 cleavage products deposited at sites of complement activation. This approach improves efficacy and minimizes systemic complement inhibition and immuosuppression, a benefit to SCI patients since they are prone to urinary tract infection. Administration of CR2-fH to mice after contusion injury to the spinal cord significantly improved locomotor recovery. Using fluorescently labeled CR2-fH and ex-vivo fluorescence tomography, we demonstrated that that similar levels of CR2-fH localized to injured spinal cords at 1, 3 and 7 days post-SCI, whether the inhibitor was administered 30 min or 3 hours after SCI. Furthermore, analysis of locomotor gait recovery over a 21 day period revealed significant and similar levels of improvement in mice given the inhibitor at either 30 min or 3 hour after SCI. Improved recovery correlated with reduced complement deposition at the injury site. Finally, nanostring analysis of gene expression in spinal cord tissue at 3 days post injury revealed that CR2-fH reversed changes in expression of 67% of genes associated with SCI. Key inflammatory pathways modulated by CR2-fH were TLR signaling and cytokine signaling pathways, some of which have been identified as critical players in the immunopathology of SCI. *VAMC; SCIRF*

260 Culturing T Cells in N-Acetylcysteine Protects From Activation Induced Cell Death and Enhances Killing of Melanoma Cells

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Immunotherapy using adoptively transferred cells requires expansion to large numbers for patient infusion. T cells increased via the Rapid Expansion Protocol (REP) are more susceptible to Activation Induced Cell Death (AICD) upon TCR restimulation by tumor cells. Pharmacological inhibition of p53 using pifithrin-μ implicated a role for this stress response protein in AICD. p53 function is modulated though numerous posttranslational modifications and here we demonstrate that TCR restimulation of human T cells results in a time-dependent increase in phosphorylation of p53 on Ser15, which correlated with onset of cell death. Detection of phospho-p53 (Ser15) was limited to the nucleus and coincided with phosphorylation of Ataxia Telangiectasia Mutated (ATM), an enzyme involved in the DNA damage response pathway. Significant increases in γH2AX and phospho-SMC-1 confirmed that TCR restimulation resulted in DNA damage and pharmacological inhibition of ATM by KU55933 or caffeine prevented cell death. In addition the JNK inhibitor SP600125 and the anti-oxidant N-acetyl cysteine (NAC) abrogated phosphorylation of ATM and prevented the increase in γH2AX. Activation of the DNA damage response pathway was also observed as a consequence of antigen-specific TCR restimulation in melanoma specific TIL1383I TCR transduced cells, regardless of whether donor T cells were derived from healthy volunteers or melanoma patients. Culturing T cells in NAC improved survival of T cells while increasing melanoma cell killing in vitro. Moreover, Pmel cells cultured in NAC demonstrated enhanced persistence in the blood following adoptive transfer into B16 challenged mice and also improved the survival of recipient mice. In summary, our data highlight a role for activation of the DNA damage response pathway following TCR restimulation and its potential translational significance in adoptive T cell therapy. *NIH P01 CA154778*

261 Changes in Dopamine D1 Receptor Function After Adolescent Intermittent Ethanol Exposure in Layer V Pyramidal Cells of the Prefrontal Cortex

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Adolescence is an important time of neurocognitive development and is also a period when the brain is especially vulnerable to environmental insult. Adolescents frequently abuse alcohol, and this abuse can result in lasting damage. One of the last regions of the brain to complete development is the prefrontal cortex (PFC), a region that mediates inhibitory control, decision-making, and behavioral flexibility. Our lab uses the adolescent intermittent ethanol (AIE) exposure model to investigate how repeated episodes of binge alcohol exposure during adolescence impact the function of the adult brain. Studies from our lab have demonstrated that AIE exposure results in protracted deficits in PFC function at both the cellular and behavioral level. Of particular importance may be alterations in the developmental trajectory of dopaminergic innervation of the PFC. Our data further suggest changes in dopaminergic function including deficits in signaling through D1-like receptors. Follow-up experiments are currently examining how this loss of D1 function alters synaptic function on layer V pyramidal neurons, which are the main projection neurons of the PFC to subcortical structures. Of note is preliminary data suggesting that pharmacologically targeting dopaminergic signaling during alcohol exposure can prevent the deficits in D1 signaling observed in adulthood. *NIAAA*

262 Transient Synaptic Potentiation in Nucleus Accumbens Shell Underlies Inhibition of Drug Seeking

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Discovering mechanisms underlying inhibition of drug seeking is critical to developing new therapies for substance use disorders. Extinction training consists of animals repeatedly receiving no reinforcement for pressing a lever formerly paired with cocaine infusions. Animals successfully inhibit drug seeking when returned to the extinguished context. This inhibition requires glutamatergic input to nucleus accumbens (NA) shell. Transient synaptic potentiation (tSP) is a physiological correlate of behaviors requiring glutamatergic inputs into nucleus accumbens. For example, cue-induced reinstatement of drug seeking is associated with tSP, defined as rapid increases in AMPA:NMDA ratio and dendritic spine head diameter that normalize by the end of the reinstatement session. The role of tSP in behavior requiring accumbens glutamatergic transmission leads us to hypothesize that exposure to an extinguished context will induce tSP in NA shell. Following 10 days of cue-paired cocaine self-administration, animals underwent 2-3 weeks of either extinction training or home-cage abstinence. Animals were sacrificed after 15 minutes of exposure to one of three behavioral situations: a) the drug-paired context without drug-paired cues (abstinent relapse), b) the extinguished context without drug paired cues (extinction expression), or c) the extinguished context with drug paired cues (cue-induced reinstatement). We used whole cell patch clamp electrophysiology to examine AMPA:NMDA ratio and diolistic labeling to image dendritic spines. Extinction expression, in which animals inhibit drug seeking, induced tSP in NA shell. However, abstinent relapse or cue-induced reinstatement, in which animals fail to inhibit drug seeking, do not induce tSP in NA shell. Unlike NA core tSP (associated with cue-induced reinstatement) NA shell tSP was confined to increased AMPA:NMDA ratios and did not extend to changes in spine morphology or MMP activity. This finding suggests dissociable synaptic signaling mechanisms in dissociable accumbens subcompartments that promote or prevent drug seeking behavior. *F30 DA038893, TL1TR000061, T32 GM008716*

263 Assessing Type I Error and Sample Size Requirements of Multistate Markov Models for Panel Data - A Simulation Study

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The modified Rankin Scale (mRS) score is one of the most commonly used primary outcome measures in Phase III clinical trials of acute stroke therapy (AST). The mRS is a seven-point ordinal scale that measures degree of disability of stroke patients, ranging from 0 (normal) to 6 (death). Ordinal outcomes, such as the mRS, are often dichotomized for ease of analysis and clinical interpretation. Also, despite the fact that in many clinical trials, including AST trials, the outcome is collected at multiple follow-up visits, data from only one follow-up visit is used in the primary analysis. Dichotomization and failure to utilize the repeated measures data is inefficient. Markov Multistate Model (MMM) is a method that allows analysis of repeated ordinal measures data. MMM describes how a process moves between states over time and has been used in a number of disease applications. MMM has been adapted to analyze panel data (data that represents a continuous process that is only observed at discrete time points). In AST trials, subjects are most likely to remain in the same health state (the seven levels of the mRS) or improve or worsen by one state at the next follow-up visit. Because of this, a limited number of non-adjacent state transitions are observed. The operating characteristics (type I error and sample size) of the MMM used for this type of data, with small counts of non-adjacent state transitions, have not been previously considered. Herein, simulation studies are performed under various conditions to investigate the type I error and sample size of MMM for panel data and compared to typical analyses of the mRS data from AST trials. *NIH/NINDS U01 NS061861*

264 Childhood Brain Cancer in Florida: a Bayesian Clustering Approach

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In this article we focus on geocoded data for pediatric brain cancer in Florida. Specifically, we examine zip code level pediatric brain cancer counts from a registry and assess the degree of spatial clustering in these data. We assume a Bayesian model for relative risk and examine a variety of posterior measures that indicate excess risk (exceedence probability of relative risk or positive residual). We assume a standard Poisson convolution model and examine a zero-inflated model with a factored intercept. We conclude that there is evidence of excess risk in a number of relatively dispersed zip codes across the state but there appears to be some concentration of high excess risk in Polk, Lake and Sumter counties (west of Orlando and north east of Tampa). These excesses are confirmed across various models.

265 Effect of Induction Therapy on Graft Survival in Primary Pediatric Heart Transplantation: A Propensity Score Analysis of the UNOS Database

, Melanie L Davis, Ryan Butts, Andrew Savage, Ali Burnette, Minoo Kavarana, Scott Bradley, Andrew Atz, Paul Nietert; *Public Health Sciences, MUSC*.

The use of induction therapy in pediatric heart transplantation has increased. The aim of this study was to investigate the effects of induction therapy on graft survival. The United Network for Organ Sharing (UNOS) database was queried for isolated pediatric heart transplants (age < 18 years) from January 1, 1994 to December 31, 2013. Propensity scores for induction treatment were calculated by estimating probability of induction using a logistic regression model. Transplants

were then matched between induction treatment groups based upon the propensity score, reducing potential biases. Using only propensity score matched transplants, the effect of induction therapy on graft survival was investigated using Cox-proportional hazards. Sub-group analyses were performed based upon age, race, recipient cardiac diagnosis, HLA donor:recipient matching and recipient panel-reactive antibody (PRA). Of 4565 pediatric primary heart transplants from 1994 to 2013, 3741 had complete data needed for the propensity score calculation. There were 2792 transplants that were successfully matched (induction n=1396, no induction n=1396). There were no significant differences in transplant and pre-transplant covariates between induction and no induction groups. In the Cox-proportional hazards model, the use of induction of was not associated with graft loss (HR = 0.88; 95% CI: 0.75-1.02; p=0.08). In sub-group analyses, improved survival was seen in patients with PRA >50% (HR=0.57; 95% CI: 0.34 – 0.97) and congenital heart disease (HR=0.78; 95% CI: 0.64-0.96). In conclusion, induction therapy is not associated with improved graft survival in primary pediatric heart transplantation. However, in pediatric heart transplant recipients with PRA>50% or congenital heart disease, induction therapy is associated with improved survival. *HRSA 234-2005-370011C; NCATS UL1TR000062; NIGMS U54 GM104941*

266 KCa2 Channel Inhibition in the Infralimbic Prefrontal Cortex is Required for MGluR5-dependent Enhancement of Extinction of Alcohol-seeking Behavior and Synaptic Plasticity

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Abstract not available.

267 Potassium Channel Gene Regulation in the Prefrontal Cortex As a Basis for Investigating Novel Pharmacogenetics Therapies to Reduce Heavy Alcohol Drinking in Mice

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Abstract not available.

268 CTCE Improves Endothelial Cell Barrier Function in LPS-induced ALI Through Altering MicroRNA 126 Expression and Rac 1 Activation

, Changrun Guo[1], Andrew J Goodwin[2], Joy A Buie[1], James V Cook[1], Perry Halushka[3], Kelley Argraves[4], Basilia Zingarelli[5], Hongkuan Fan[1]; *[1]Neurosciences, MUSC, [2]Pulmonary, Critical Care, Allergy, and Sleep Medicine, MUSC, [3]Medicine, MUSC, [4]Regenerative Medicine and Cell Biology, MUSC, [5]Critical Care Medicine,Cincinnati Children's Hospital Medical Center*.

Abstract not available.

269 Objective Outcomes of Supraglottoplasty for Laryngomalacia with Obstructive Sleep Apnea: a Meta-analysis

, Zachary Farhood, Adrian A Ong, Shaun A Nguyen, M Boyd Gillespie, Christopher M Discolo, David R White; *Otolaryngology, MUSC*.

Abstract not available.

270 Demographics, Disparities, and Survival in Young Patients with Oral Cavity Squamous Cell Carcinoma, a Population-level Analysis of 3828 Cases

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Purpose: To identify prognosticators in oral cavity squamous cell carcinomas (OCSCC) in young patients. To determine whether type of hospital and insurance status correlates with survival. Methods: Retrospective review of the National Cancer Database from 1998-2012 of OCSCC in patients younger than 45. Relevant demographic, tumor, and survival variables were extracted for analysis. Results: We identified 54,565 OCSCC, 7.6% of which are under 45 years old (n=3828). More males were affected (65.7%) than females. Caucasians represented 86.3% of cases, followed by African-Americans (9.5%) and “Other” race (4.2%). Private insurance (65.6%) was most common, with Medicaid (17.6%), uninsured (11.7%), and Medicare (5.1%) comprising the rest. Overall survival at 5 years was 66%. The oral tongue subsite was most common (55.4%), followed by floor of mouth (FOM, 28.5%), gingiva/retromolar trigone (15.4%), and buccal mucosa (0.7%). An increasing incidence of oral tongue cancers was seen, while FOM cancers showed a decreasing trend over the study period. A minority of cases was treated at low-volume community cancer centers, which saw more stage I-II disease. Uninsured and Medicaid patients had more advanced stage III-IV disease ($p < 0.001$) while those with private insurance had more early stage disease. Further analysis including treatment, insurance, demographics, and survival was performed. cStage I-II patients without private insurance were more likely to receive some form of chemotherapy. Ethnicity, insurance status, income, age group, pathologic stage, and positive surgical margins are significant prognosticators on univariate analysis. In multivariate analysis, high pathologic stage, non-private insurance, treatment at a low-volume community center, and positive margins remained predictors of worse survival. Conclusions: In young patients with oral cavity cancers, differences in treatment, presentation, and survival were

seen in those with health disparities. In addition to staging and surgical margins, treatment at low-volume community cancer centers and non-private insurance status predicted worse survival.

271 Efficacy of Upper Airway Stimulation on Collapse Patterns Observed During Drug-induced Sedation Endoscopy

, Adrian A Ong[1], Alexander W Murphey[1], Shaun A Nguyen[1], Ryan J Soose[2], B Tucker Woodson[3], Olivier M Vanderveken[4], Nico de Vries[5], M Boyd Gillespie[1]; *[1]Otolaryngology, MUSC, [2]Otolaryngology, UPMC, [3]Otolaryngology, MCW, [4]Otolaryngology, Antwerp University Hospital, [5]Otolaryngology, Saint Lucas Andreas Hospital*.

Abstract not available.

272 Transplanted Hematopoietic Stem Cells Form Functional Osteoblasts That Deposit Collagen and Repair Bone in Mouse Model of Osteogenesis Imperfecta

, Inhong Kang[1], Makio Ogawa[1], Amanda LaRue[2], Meenal Mehrotra[2]; *[1]Pathology and lab medicine, MUSC, [2]Research Services, Ralph H Johnson VAMC*.

Osteogenesis imperfecta (OI), an autosomal dominant disorder caused by mutation in type I collagen, is the most common hereditary bone disease. At present there is no cure. Many strategies are being tested involving stem cells. Previously we have shown that transplantation of bone marrow (BM) cells highly enriched for hematopoietic stem cells (HSCs) ameliorate bone defects seen in OI mice. We have also demonstrated that HSCs give rise to osteoblasts in normal bone as well as non-stabilized fracture repair. Therefore, we hypothesized that HSC transplantation leads to replacement of affected osteoblasts with normal cells leading to the correction of collagen defects. Transplantation of clonal population derived from a single EGFP+ HSC into irradiated OI mice (oim; B6C3Fe a/a-Col1a2oim/J) was used to test our hypothesis. Dramatic improvements were observed on micro-CT analysis of tibia including increase in bone volume, trabecular number and trabecular thickness with decrease in trabecular spacing in clonally engrafted oim. Analysis of control oim demonstrated continued deterioration in bone parameters. Paraffin sections of decalcified bones showed presence of numerous GFP+ cells within bone which stained positive for osteocalcin, demonstrating that HSCs engraft in bone and differentiate to osteoblasts. Picosirius red staining of sections from clonally engrafted oim showed the presence of structurally improved collagen when compared to control oim. The collagens extracted from clonally engrafted oim contained a mixture of both a1 and a2 chains, similar to those from normal mice, while those from control oim shown presence of only a1 chain. Immunofluorescent staining demonstrated that the GFP+ cells in bone (HSC-derived) were the ones which secreted Col1a2. These data indicate that HSC transplantation leads to clinical improvements in oim and that HSC-derived osteoblasts are functional. These findings are significant in that they can be applied to long-term studies to enhance and accelerate bone healing in OI. *NIAMS K01 AR059097, R01 AR066094, Pathology and Lab Medicine*

273 Across Time and Space: Using Independent Component Analysis to Characterize Spatial and Temporal Differences in Functional Neural Networks Between Cocaine and Alcohol Abusers

, Tonisha E Kearney-Ramos, Logan Dowdle, Oliver Mithoefer, Chris Mullins, Will Devries, Mark S George, Colleen A Hanlon; *Psychiatry and Behavioral Sciences, MUSC*.

Disrupted cortical-subcortical connectivity has been observed in multiple substance dependent populations. While altered functional connectivity has been linked to craving and cognitive performance among cocaine and alcohol users independently, it is unclear which patterns of neural disruption are common across substance use disorders (SUDs), and which are unique to the abused substance (e.g. cocaine versus alcohol). To determine patterns of functional connectivity common to or differentiating cocaine and alcohol users, independent component analysis (ICA) was applied to functional neuroimaging data from 38 substance dependent individuals (19 cocaine, 19 alcohol) performing a cue-induced craving task. ICA identified 75 functional brain networks based on temporal coherence of activity across brain regions. Spatial representations of several networks were compared between groups (thresholded at $|t(37)|>3$, cluster size≥32 voxels for FWE $p<.05$), and temporal representations of networks were compared via power spectral analysis. There was no significant difference in spatial or temporal profile of default mode or cognitive control networks (e.g. frontoparietal). However, there were significant spatial and temporal differences in several salience/attentional bias networks. Spatially, cocaine users had significantly higher striatal network recruitment of visual cortex ($\beta=.31$) than alcohol users ($\beta=-.52$; $t(37)=5.86$, $p<.05$). Additionally, alcohol users had significantly higher recruitment of right anterior insula into ventral visual network ($\beta=.88$) relative to cocaine users ($\beta=.12$; $t(37)=-5.22$, $p<.05$). Temporally, there was no difference for the striatal component, but there were significant differences for multiple components loading on medial and lateral prefrontal cortex – with cocaine users favoring higher frequencies (e.g. 0.5 Hz versus 0.1 Hz). These data suggest that patterns of network composition and temporal dynamics provide distinct sources of variability that may differentially relate to cognitive and behavioral dysfunction in SUDs. Future work should identify functional network markers that reliably distinguish dysfunction across SUDs and use these to enhance

treatment selection and prediction of outcomes. *NIH R01 DA036617; P50 DA015369; P50 AA010761; T32 DA00728823*

274 Impact of an Inpatient Tobacco Cessation Service

, Georges J Nahhas[1], Kathleen Cartmell[2], Vince Talbot[3], Danny Woodard[4], Dianne Wilson[1], Graham Warren[5], Ben Toll[6], Micheal K Cummings[1]; *[1]Psychiatry and Behavioral Sciences, MUSC, [2]College of Nursing, MUSC, [3]TelASK Technologies, Ottawa, [4]Tobacco-cessation, MUSC, [5]Radiation Oncology, HCC, MUSC, [6]HCC, MUSC*.

The Joint Commission which sets quality standards for hospitals in the US recommended that all smokers identified upon hospitalization receive tobacco-cessation services and be followed-up within 1-month post-discharge. The Medical University of South Carolina (MUSC) implemented an inpatient smoking-cessation program employing interactive-voice-recognition (IVR) to follow-up patients. This presentation examines the reach and impact of this service on smoking-cessation. Cigarette-smokers were identified using electronic-health-records and enrolled in the program which involved provision of a bedside-consult and post-discharge follow-up calls. IVR calls queried about current smoking-status, use of stop-smoking medications, and offered the option of being connected to a live quit-line specialist at the SC-Quit-Line where they could receive free counseling and stop-smoking medications. Data were available on 42,061 patient-records; 20% were current cigarette-smokers; 5,678 (67%) were enrolled the tobacco-cessation service. Of those enrolled, 27% received bedside-counselling while 1,558 responded the post-discharge calls. The program reached 55% of the enrollees. Having a psychiatric condition was associated with low response to the follow-up calls, while being seen by the bedside counselor was associated with a 24% increase in response; 31% reported not smoking. Being seen by a bedside counselor increased use of quit-smoking medications by 3.3 times and abstinence by 1.8 times, and lower hospital readmission rates. Of the 169 eligible cancer patients, 70% were reached by the program and 27% were seen by the counselor; 36% reported abstinence. Being seen by a bedside-counselor increased the response rate, use of stop-smoking medications, and abstinence rates. Quit rates among cancer patients was low prompting the need for increasing awareness about the benefits of quitting on cancer treatment. MUSC recently hired a second bedside-tobacco-cessation specialist to improve the overall reach and impact of the program. A study by the College of Nursing is underway to assess the impact of the program on hospital readmission rates. *MUSC Health*

275 Bariatric Radiation Therapy (BaRT) for Ghrelin Suppression and Weight Loss: Proof of Concept in Porcine Model

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Abstract not available.

276 PBP3 is the Only Essential High Molecular Mass PBP in Pseudomonas Aeruginosa

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Peptidoglycan (PG) is a mesh-like structure that envelops bacterial cells, conferring rigidity, cell shape and protection against internal turgor pressure. The final stages of PG synthesis are mediated by so-called penicillin-binding proteins (PBPs) that function as transpeptidases (TPases) to form peptide cross links between adjacent glycan strands. PBPs are the well-known targets for beta-lactam antibiotics. P. aeruginosa is a major human pathogen that presents a particular risk to immunocompromised patients and to those suffering from cystic fibrosis. Mortality rates among such patients are very high. Pa is difficult to treat, in part due to high levels of antibiotic resistance among strains. PBPs are validated drug targets, but very little is known about their essentiality and physiological functions in Pa. With the goal of developing new antibiotics against Pa, we sought to identify which PBPs represent legitimate drug targets. We performed systematic gene knockouts of all the high-molecular mass (HMM) PBPs of Pa and determined the impact on cell growth, cell morphology, susceptibility to beta-lactams and virulence. The TPase domains of most PBPs could be genetically disrupted with minimal effects, indicating functional redundancy between PBPs in Pa. The striking exception was PBP3, which is required for cell growth. Conditional deletion of PBP3 also caused cell division deficiency, and increased susceptibility to beta-lactams. An expected finding from this investigation is that although the TPase domain of PBP1a is not essential for growth, it is required for cell swarming. Moreover, construction of Cherry Red fusions showed that PBP1a was located at the two poles, whereas all other HMM PBPs were equally distributed throughout the cell. These data suggest a specialized function for PBP1a. In conclusion, PBP3 is the only essential PBP in P. aeruginosa and therefore is a promising target for drug development. PBP1a appears to have a unique physiological role that may be related to motility. *NIH R21 R21 AI109385*

277 Tranexamic Acid Decreases Blood Loss Following Total Shoulder Arthroplasty

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Background: Tranexamic acid (TXA) significantly decreases blood loss and transfusion rates following THA and TKA. The purpose of this study was to determine the effects of intravenous TXA on blood loss and patient outcomes following total shoulder

arthroplasty (TSA). Methods: TXA was used in 106 consecutive patients undergoing primary anatomic and reverse TSA using a dose of 20mg/kg IV (TXA group) and compared to the previous consecutive 88 without TXA (Non-TXA group). All patients had a hemoglobin (Hb) and hematocrit (Hct) drawn the morning after surgery. Analysis of variance and chi square techniques were used to analyze study hypotheses. Results: Statistically significant differences in both Hb loss (TXA group Δ=2.13 vs Non TXA Group Δ=2.63, p=0.01) and Hct loss (TXA group Δ=6.4 vs Non TXA group Δ=8.14, p<0.01) were seen in the TXA group compared to the non TXA group. In patients receiving TXA, there were statistically significant decreases in the time spent in the recovery room (mean, TXA group 69 mins vs Non-TXA group 87 mins, p < 0.02) and total length of hospitalization (mean, TXA Group 1.18 days vs Non TXA group 1.4 days, p=0.01). Two patients in the TXA group received a blood transfusion while six patients in the non TXA group received transfusions. Conclusions: TXA 20 mg/kg IV given just prior to primary anatomic and reverse TSA results in statistically significant reductions in blood loss. Patients spent 21% less time in the recovery room and had a 16% shorter hospitalization, resulting in financial savings for the hospital.

278 Using An Item Bank to Measure Activity of Daily Living Across Facilities: Comparing Measurement Precisions of Short Forms in Veterans

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Rationale: Previous research has shown that measuring patients function across facilities that use different outcome assessments can be achieved by creating an item bank, i.e., combining the two assessments. Since it is impractical to administer all item bank items, short forms (SFs) need to be generated to reduce respondent burden. However, SFs may introduce more error than the original longer outcome measures. The purpose of this study was to compare the measurement precision of the full item bank (26 items), full-length tests (each 13 items), 4- and 8-item SFs. Methods: This study used a national sample of 2500 Veterans (stroke, amputation, knee replacement and hip replacement) who completed both the Functional Independence Measure (FIM™) and the Minimum Data Set (MDS) within 6 days. The 4- and 8-item SFs were developed using item response theory (IRT) procedures. This study examined person strata (>3), ceiling/floor effect (<5%), test standard error plots (<0.3). Results: The FIM SFs had mild floor effects (6-7%) and the MDS SFs had moderate ceiling effects (17-18%). Overall, SFs with more items had better precision and SFs with the same number of items had similar precision (e.g., the three, 8-item SFs had person strata= 3.47, 3.37 and 3.16). The 8-item and 4-item SFs had strong correlations with the item bank (r=0.82~0.95 for the 8-item SFs; r=0.80~ 0.90 for the 4-item SFs). However, the three 4-item SFs did not meet the criteria of SE less than 0.3 for any theta values. Conclusion: SFs with the same numbers of items demonstrated similar precision. A good balance between precision and efficiency is the 8-item SFs (FIM or MDS). A combination of FIM and MDS items would likely eliminate floor and ceiling effects. We suggested the practitioners using SFs that show a balance between efficiency and precision. *Department of Veterans Affairs IR 11-223-1*

279 First Generation CAR-T Therapies Can Be Rendered Therapeutically Effective When Engineered Into a Novel Human Memory CD4+ T Cell Subset

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Abstract not available.

280 Improving Adoptive T Cell Transfer Mediated Melanoma Immune Therapy By Targeting Gp96/grp94 in Regulatory T Cells

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Abstract not available.

281 The Oral Commensal Flora, a Dynamic Regulator of Alveolar Bone Remodeling

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Abstract not available.

282 Utilization Percentage of Computer-Assisted Total Knee Arthroplasty Displays Wide Variation By Geographic Location

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Objective Total Knee Arthroplasty (TKA) is one of the most common orthopaedic procedures performed due to its cost-effectiveness, reliability, and ability to relieve pain and improve function. Conventional TKA methods have demonstrated reproducible results and excellent outcomes. However, component malposition can lead to excessive wear, loosening and suboptimal outcomes. Computer-assisted navigation TKA (CTKA) may result in more consistent radiographic alignment, but several

studies have failed to demonstrate meaningful clinical benefit compared to conventional TKA techniques. We hypothesized that CTKA utilization is more heavily influenced by market dynamics and local practice patterns as opposed to clinical evidence, and therefore is likely to demonstrate considerable geographic variation. Methods Patient information was obtained from the 2012 and 2013 Medicare Database. Patients were identified from these national registries based on CPT codes for primary TKA, 27446 and 27447. In addition, patients with the add-on CPT Code for Computer Assisted Surgery, +20985, were selected. Results were then categorized by state, and percentage of computerized TKA was calculated as a percentage of total TKA performed. Results Utilization percentage was highest in the Western United States, and isolated Northeastern States. Utilization was highest in Mississippi, where 34..2% of all TKA's identified were CTKA. Lowest utilization of CTKA was in Arkansas, at 0.9%. Idaho, Oregon, Hawaii and Mississippi showed utilization percentages between 22-24%, while, California, Nevada, Washington, Arizona, Alaska, Vermont and Massachusetts displayed CTKA percentages between 13-18% of total TKA's performed. Oklahoma, New York and Virginia displayed percentages between 10-12%, while all other states had utilization percentages below 8% Conclusion Wide variation of CTKA by geographic location exists in the United States. CTKA appears to be more frequently utilized in the Southwest and West Coast regions. These data may have important implications as the health care system places greater emphasis on evidence-based and cost-effective treatments.

283 Is the C2 Spinous Process Efficacious As an Intraoperative Indicator for Avoidance of the Vertebral Arteries During Posterior Cervical Arthrodesis?

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Posterior cervical arthrodesis at the C1/C2 vertebral level is technically challenging due to the close proximity of the vertebral arteries. We believe an intraoperative bony landmark to guide dissection to avoid the vertebral arteries is useful. We hypothesize that the C2 spinous process could serve this purpose. Patients under 16 years old with a cervical spine CT scan were included. Two measurements were made: one of the full width of the C2 spinous process base (FW) and another, angled measurement in line with the posterior arch of C2 from the midline of the bifid C2 spinous process to the most lateral aspect of the base of the spinous process where it inserts into the lamina (MW). 465 total patients were included. The sample was stratified into 5 age groups (group 1: <2 years old, 2: 2-<4, 3: 4-<6, 4: 6-<8, and 5: ≥8). The mean FW was 17.69 mm ± 2.43 mm and the mean MW was 11.94 mm ± 2.32 mm. For both FW and MW, the measured values increased as the age group increased. There was a statistical difference between group 5 and all other groups in the MW, with the MW being smaller in younger patients ($p < 0.001$). There was also a statistical difference ($p \leq 0.001$) between groups 1 and 4 in this same measurement. Our results showed a linear increase in C2 FW and MW with increased age. Compared to prior anatomic studies, the mean MW of C2 falls within the location of the vertebral arteries at C1 in all groups. Our study thus suggests that the C2 spinous process serves as a reliable intraoperative indicator of the lateral extent of dissection in order to avoid the vertebral artery at C1 during posterior cervical surgery.

284 A Custom App Provides Reliable Finger Measurement Faster Than A Goniometer

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INTRODUCTION: In orthopaedic hand clinics, measurement of finger joint motion is commonly performed using mechanical goniometers, producing results that are accurate and precise but time-consuming. Recent studies have validated the use of a smartphone clinometer for measuring motion of the shoulder and knee. We investigated a custom iOS application for finger measurement designed to provide equivalent precision and superior efficiency compared to a mechanical goniometer with paper recording. METHODS: Examinations of finger range of motion were conducted by two orthopaedic hand surgeons and five residents using the custom iOS application (app) and an off-the-shelf mechanical goniometer. Plastic anatomic models of the hand, glued in flexion for standardization, were examined. The examiners followed a printed protocol and familiarized themselves with the devices before starting. Each hand examination measured the flexion angles of the thumb MP and IP joints and the finger MCP, PIP, and DIP. The angle was immediately recorded when captured in the app. Goniometric measurements were recorded on paper in a pre-printed grid. Examiners measured each hand twice with each device, for a total of 8 exams and 112 data points per examiner and 784 measurements overall. Each hand examination was timed. RESULTS: The app and the goniometer both demonstrated high reliability for repeated and comparative measurements as tested by ICC. The Cronbach's alpha score for the goniometer was 0.929 and for the app, 0.938. Pearson correlation coefficient between device measurements was 0.845. The app provided more rapid and statistically significant data acquisition with mean times of 2:13 for the app and 2:52 for the goniometer. DISCUSSION: The app is a similarly reliable measurement instrument to the goniometer and allows significantly faster capture of the range of motion of finger joints than a mechanical goniometer

KEYWORDS

AUTHORS