



DEPARTMENT of PATHOLOGY  
& LABORATORY MEDICINE

# PATHOLOGY & LABORATORY MEDICINE NEWSLETTER

Volume 3, Issue 1 2012

## LETTER FROM THE CHAIR

### Where have all the Pathologists gone?

This year, once again, we have been very fortunate to fill all our residency training program positions with outstanding candidates in the National Residency Match Program. The rising first year residents in Pathology and Laboratory Medicine are Jessica Forcucci, MUSC; Natalie Mason, Buffalo State University; Edward “Tripp” Tracy, MUSC; Austin Turner, University of Tennessee; and Nicole Dominiak, University of Toledo.

I say, “very fortunate,” because, in recent years, there has been a national trend of decreasing numbers of 4<sup>th</sup> year medical students entering Pathology. Nationally, only half of the 521 matched positions in pathology this year were filled by senior US graduates, with the remainder being previous US graduates (switching career choices) and osteopathic graduates. In addition, after being trained in academic medical centers, the majority of US trainees select private practice positions. They have seen and experienced academic life and decided to opt out, chiefly for quality of life reasons. Very few among them ever return to work in an academic medical center. In fact, only 10 percent of all pathologists practice at academic medical centers. For many academic pathology departments at medical schools where state-support is essential, the national economic downturn has resulted in severe budget reductions. Pressured to practice and produce as their private counterparts, while meeting their teaching, research and publication goals required for academic career advancement, now, more than ever before, academic pathology faculty are joining their residents and heading out the door.

<b>Inside this issue:</b>	
From the Chair	1-2
Welcome Dr. Ethier	3
Promotions	3
Arrivals/Departures	4
Baby News	4
IT Update	5
Commendation	6
Congratulations	7
Research Division	8
Save the Date	9
Education Notes	10-11
Placental Path Update	12
Antibiogram	13-15
New COM Chairs	15
Spring Symposia	16



#### Mission Statement:

To serve patients, health care providers, research scientists, scholars, and society by providing excellence and innovation in diagnostic services and educational resources in a respectful, professional and culturally diverse atmosphere.

#### Vision:

To become a preeminent leader in academic anatomic and clinical pathology while translating basic science discovery to improved clinical care.

## LETTER FROM THE CHAIR

### continued



Compounding the problem for the foreseeable future is the “graying” of the field. Pathology as a subspecialty field ranks nationally as the second oldest among medical subspecialty fields. Over 40 percent of practicing pathologists are 56 years old or older. Many of these pathologists look forward to retiring in the next decade. Academic pathology departments note that it is becoming more and more difficult to find qualified candidates to fill existing vacancies. The decreasing number of residents selecting academic medicine as a career is fast approaching the point where it will not fulfill the need. The number of retiring pathologists, the dire effects of state budget reductions on academic pathology departments at state-supported medical schools, the quality of life issues in academic medicine, and the decline in applicants to pathology programs nationwide are all ominous signs.

So, as we listen to the weakening sound of the “canary in the mine,” what are we to do? Here at MUSC, we have a strong commitment to our Pathology Residency Training Program and to the resident trainees that choose to come to us. This begins with the Chair providing full programmatic support to the Residency Program Directors to include: adequate travel budget to support national residency meetings; administrative and clerical support within the department; protected time for the directors in which to do the job; adequate funding to support an appropriate recruitment process; and visible advocacy of the program throughout the Department to ensure that all are aware of their individual responsibilities in the training of our residents.

The strength of our program is certainly multi-faceted. First, our Program Directors are committed to expanding the diversity of the recruitment pool by reaching out to attract applicants from schools across the country. Second, our faculty are deeply committed to training our recruits in interesting and creative ways to ensure that the field of Pathology is intriguing, exciting and rewarding. Third, the supervisory and technical staff throughout the Department is superb in the manner that each helps educate the residents rotating through their area of responsibility. Fourth, our administrative staff within the Department stands ready to support each of our resident trainees to ensure that they are able to focus on becoming proficient in the field of Pathology. Fifth, and finally, our resident staff are the true ambassadors of our program. It is our current residents who assist in the interview process and share their experiences with potential recruits. It is our current residents who speak highly of our program and convey to the interviewees that they will make the right choice in choosing MUSC, they will enjoy the program and, most importantly, they will become a proficient and well-trained pathologist.

Does our system work? It must. We have a time honored tradition, encompassing the past 20 years or so, of MUSC’s medical school having placed first or second in the country as having the highest percentage of those completing medical school at MUSC becoming board certified pathologists. Those pathologists received an outstanding education at MUSC. Coupled with this history and an outstanding residency training program, MUSC is doing its part in mitigating these external pressures on our chosen field. For our discipline of Pathology to withstand these challenges and meet the needs of our future colleagues, we must all join together in these efforts.

# DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE

## NEWS FROM DEPARTMENT ADMINISTRATION & BUSINESS OFFICE

# WELCOME!

### Genetics researcher joins HCC to co-lead program



*Dr. Stephen Ethier*

Stephen P. Ethier, Ph.D., a noted researcher in breast cancer biology and cancer genomics, will co-lead the Hollings Cancer Center's Cancer Genetics and Molecular Regulation Program.

Ethier, a professor of Pathology and Laboratory Medicine, holds the Spaulding-Paolozzi Chair in Breast Cancer Diagnosis, Treatment and Research. Ethier's research explores the genetic drivers of cancer, specifically which few genetic alterations among the thousands found in cancer cells drive a tumor's growth. While his work has largely focused on breast cancer, Ethier said that causal genetic drivers for one type of cancer likely play a role in others.

"This is one of the most exciting frontiers in cancer research. The genetic focus on cancer means that we'll be able to develop more drugs that target tumors based on their genetic signatures rather than where they originate in the body," he said. "This is going to make a dramatic impact in cancer treatment."

Ethier said that all National Cancer Institute-designated centers such as Hollings are ramping up their genetics research programs by investing in scientists and sophisticated DNA sequencing technology that will help revolutionize how cancer is diagnosed and treated. The work he and his team do will have scientific applications across MUSC's campus.

Steve Lanier, Ph.D., associate provost for research, said MUSC is fortunate to have recruited Ethier to Hollings. "His work will clearly help accelerate our programs in cancer genomics and in our push to have the latest in genome-based technologies on campus for our research and clinical teams. He is highly regarded in the field and will have an immediate impact on our research programs across campus."

Nigel Redden, president of the Spaulding Paolozzi Foundation, said the foundations' board of directors is honored to have someone of his caliber serving as the Spaulding-Paolozzi chair. "Dr. Ethier brings with him very impressive credentials. His expertise and leadership exemplify the kind of excellence people have come to expect from MUSC."

From: The CATALYST, March 2, 2012

## PROMOTIONS!

**S. Erin Presnell, M.D.** was promoted on January 1, 2012 from Associate Professor with Tenure to Professor with Tenure. In Anatomic Pathology, Dr. Presnell is Director of Medical and Forensic Autopsy and Director of the Education Division.



**Omar Moussa, Ph.D.** was promoted on January 1, 2012 from Assistant Professor to Associate Professor. Dr. Moussa is in the Research Division and he is the Director of HLA Laboratory.



**Jerry Squires, M.D., Ph.D.** received his tenure on January 1, 2012. Dr. Squires is an Associate Professor in our Department and the Medical Director of Transfusion Medicine.





## New Hires:

### ***Meagan Nista***

Hired on January 1, 2012 as a Research Specialist I. She is working in our Research Division with Dr. Omar Moussa.

### ***Stephen Ethier, Ph.D.***

Hired on January 15, 2012 as a faculty member in our Research Division. He is also co-leading the Hollings Cancer Center's Cancer Genetics and Molecular Regulation Program.

### ***Bridget Varughese***

Hired on January 15, 2012 as a Post-Doctoral Scholar. She is working in our Research Division with Dr. Stephen Ethier.

### ***Lisa Coulter***

Hired on January 23, 2012 as an Accountant/Fiscal Analyst II. She is working with Beth Hansell in the Business Office.

### ***Shweta Singh***

Hired on February 13, 2012 as a Post-Doctoral Scholar. She is working in Dr. Erika Brown's lab.

### ***Khujista Haque***

Hired on March 5, 2012 as a Research Specialist I. She is working in our Research Division with Dr. Chandrakala Puligilla.

### ***Hu Yuan***

Hired on March 7, 2012 as a Visiting Scholar in our Research and he will work with Dr. Suhua Sha.

### ***Dion Foster***

Hired on March 12, 2012 as a student. He is working in our Research Division with Dr. David Turner.

## Departures & Transfers:

### ***Amy Gagliardi***

Left our department on January 6, 2012.

### ***Jagadish Venkata***

Transferred to the Department of Hematology/Oncology on January 31, 2012.

### ***Becky Dana***

Transferred to the Digestive Disease on February 1, 2012.



**Dr. Christina Carrick's  
newborn son, Gabriel Edward Carrick,  
born on January 30, 2012 at 4:45 am.  
He weighed 7 pounds, 4 oz. and  
was 19 1/2 inches long.**

**CONGRATULATIONS DR. CARRICK!**



**Dr. Yazhi Xing's  
newborn son, Ethan Jiang was born on  
January 22, 2012.  
He weighed 8 lbs. 1.2 oz. and  
was 21.5 inches long.**

**Dr. Xing is a Post Doc in  
Dr. Hainan Lang's lab.**

**CONGRATULATIONS DR. XING!**



# T Update

by  
Tony Eisenhart



## Sharing Large Files On & Off Campus

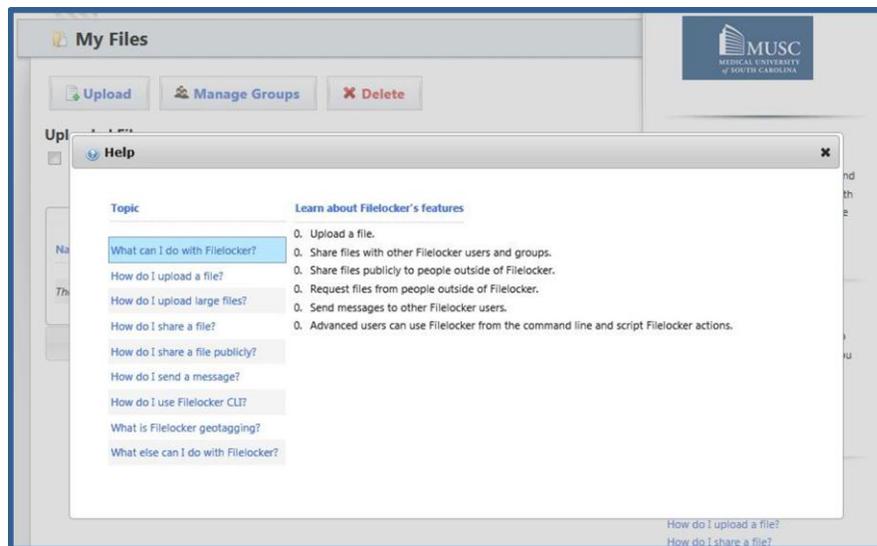
Have you ever needed to send a large file to a colleague or institution and have been unable to do so because of an email attachment size limitation? Have you ever wanted to make a large file available on line for multiple people to download? Are you frustrated with the 500MB limitation imposed on your homeroom drive? Well we have the solution for you!

<http://Filelocker.musc.edu>

Faculty, staff, and students can use Filelocker to conveniently and securely share files with other people. Filelocker is a **temporary** and **secure** storage system for sharing files large and small.

Initially Filelocker allows you to share files as large as 2GB with other people both inside and outside of Medical University of South Carolina. Users wanting to upload files larger than 2GB, or multiple files totaling more than 2GB, will need to increase their Filelocker quota (the default quota is 15000 MB) by calling the OCIO-IS Help desk at 792-9700.

To access Filelocker go to <http://Filelocker.musc.edu> and login in with your MUSC Net ID and password. A basic set of instructions, pictured below, is available on the Filelocker web interface. Look for the “How do i...” links on the lower right hand side of the web page.



## **Need a Large File From Someone?**

If you need a large file from someone who doesn't have a Filelocker account, you can email them an Upload Request while logged into the Filelocker interface. The person uploading the files does not need to be associated with or employed by MUSC to use this service.

Additionally, only certain browsers support file uploads larger than 2GB. If you are using Microsoft's Internet Explorer versions 6, 7, or 8, you will need to upgrade to [version 9](#). If you are using Mozilla's Firefox versions 1, 2, or 3, you will need to upgrade to [version 4](#). Google Chrome and Apple Safari users can upload large files with any version.

As always if you have any questions, need your web browser updated, or encounter a problem working with the Filelocker interface, please don't hesitate to contact me at 792-2032 or by email at [eisenhaj@musc.edu](mailto:eisenhaj@musc.edu).



# Congratulations!

J. Al Cannon, Jr., Esq.  
Sheriff, Charleston County



3505 Pinehaven Drive  
Charleston Heights, SC 29405-7789

February 28, 2012

James (Jim) E. Madory, D.O.  
Charleston County Sheriff's Office

#### COMMENDATION

Dear Doctor Madory,

You are member of the Medical University of South Carolina team and a crucial part of our Underwater Recovery Team (URT). You have responded to virtually every dive mission since being asked to join the team as a medical consultant. You have received no compensation for this position, responded in your own vehicle and always have the health and safety of the team members as your number one priority.

You implemented a policy that all divers have a "pre" and "post" dive check of their individual vital signs. As a result, the URT has recognized health issues that would not have been known. This information could save a diver from injury or being killed during the stringent demands of a dive mission.

You do this as a result of your love for diving and your desire to give back to the community. In addition, you are also a state constable and a volunteer for Camp Happy Days.

I am pleased to present you with a Special Recognition Award.

Yours truly,

  
J. Al Cannon, Jr.  
Sheriff

TEL: (843) 202-1700

FAX: (843) 308-7344



# CONGRATULATIONS!



As of January 1, 2012, Dr. Nolte is Chair of the Clinical Laboratory and Standards Institute Area Committee on Molecular Methods (a 4 year term).

Dr. Nolte has been re-appointed (second term) to the Editorial Board of the Journal of Clinical Micro-biology (leading journal in the field).

**Frederick "Rick" S. Nolte, Ph.D, D(ABMM), F(AAM)**



## The FACT Inspection (Bone Marrow Transplant) Is COMPLETE!

For the 4<sup>th</sup> inspection in a row, the **Cryopreservation Lab** had no deficiencies. This is, in my experience, almost unprecedented anywhere in the country. The entire **Cryopreservation Lab Staff** has done an incredible job and special recognition should go to **Jeanne Towery, our Supervisor of that section.**

She is truly an outstanding person.

**By Jerry E. Squires, M.D., Ph.D.**

## PATHOLOGY RESEARCH DAY

**August 24, 2012**



"Keynote Speaker"

**Dr. Charles Lee**

The Molecular Genetic Research Unit of Dr. Charles Lee at Brigham and Women's Hospital/Harvard Medical School develops and applies state-of-the-art, molecular cytogenetic technologies to study the structure and organization of vertebrate genomes to understand human diseases and disorders. Ongoing studies include (1) Identification and characterization of structural genomic variation from high-resolution array technologies and next generation DNA sequencing, (2) Studying genomic regions under evolutionary selection, (3) Determining risk alleles for human diseases and disorders, and (4) Correlating genetic variants with cellular function in normal tissues as well as in cancer.

## NATIONAL LABORATORY PROFESSIONALS WEEK

**April 22-28, 2012**



LABORATORY PROFESSIONALS  
**GET RESULTS**  
NATIONAL MEDICAL LABORATORY PROFESSIONALS WEEK APRIL 22-28, 2012

**Exciting Snack & Learns  
are scheduled all week.**

**The Laboratory Faculty, Staff,  
and Student Appreciation is  
scheduled on April 24<sup>th</sup>!**



**Bradley Schulte, Ph.D.**  
Vice Chair for Research

# Research Division Update

Statistics for the Division of Research from January through March. Six grant proposals were submitted requesting \$1,495,581 in total first year costs. Also, during this period seven grants were awarded totaling \$549,995 (see table below). Congratulations and many thanks to everyone involved in obtaining these awards.

GRANTS SUBMITTED			
Wang	Mechanistic Study of Resveratrol-Induced Senescence in Cancer Cells		\$364,721
Wang	Radiation-Induced Senescence in Cancer Treatment		\$367,800
Spyropoulos	Using Embryonic Stem Cell Fate to Determine Potential Adverse effects of Petroleum dispersant Exposure		\$390,585
Wang	Role of SA-miRNAs in Radiation-Induced Bone Marrow Injury		\$110,625
Sobolesky	Thromboxane Isoform-Receptor Targeted Regulation of Transcription Factor FOXO3a Activity: Novel Mechanism for Malignant Transformation		\$25,000
Findlay	MicroRNA 510 as a Biomarker of Response to Platinum-Based Chemotherapy		\$236,850
<b>Total Submissions = 6</b>			<b>\$1,495,581</b>
AWARDS RECEIVED			
Baker	Heat Shock Protein-Induced Protection Against Cisplatin-Induced Hair Cell Death	9/28/2011	\$35,099
Wang	Targeting the ROS-p38 MAPK Pathway as a Novel Strategy for Stem Cell Expansion	12/15/2011	\$18,334
Mehrotra	Role of Hematopoietic Stem Cells in Establishing the Osteosarcoma Microenvironment.	1/1/2012	\$25,000
Ethier	Amphiregulin Signaling in Human Breast Cancer	1/21/2012	\$136,438
LaRue	Hematopoietic Stem Cell-Derived Carcinoma Associated Fibroblasts in Tumors	2/1/2012	\$261,450
Watson	Role of Altered ETS Factor Expression in Breast Cancer	2/1/2012	\$60,000
Spyropoulos	Developmental Transcription Factors in Prostate Cancer	3/1/2012	\$13,674
<b>Total Awards = 7</b>			<b>\$549,995</b>

# SAVE THE DATE

**September 24, 2012**

**RESIDENTS**

**Breakfast with Dr. South-Paul**

**CH204 – 8:30 am – 10:30 am**

**September 24, 2012**

**FACULTY**

**Lunch with Dr. South-Paul**

**HCC120 – 1:00 pm – 3:00 p.m.**



## **University of Pittsburgh, Department of Family Medicine**

**Jeannette E. South-Paul, MD**

Andrew W. Mathieson Professor Department Chair

Department of Family Medicine

3518 Fifth Avenue

Pittsburgh, PA 15261-0001

### **Education**

- B.S. in Medical Technology in 1975 from the University of Pennsylvania University of Pittsburgh Medical School
- M.D. from the University of Pittsburgh School of Medicine in 1979

### **Biography**

Dr. Jeannette E. South-Paul joined the Department of Family Medicine at the University of Pittsburgh in July 2001, as the Department Chair after serving for 22 years as a family physician in the U.S. Army. She served as the Chair of the Department of Family Medicine at the Uniformed Services University of the Health Services for six years prior to her military retirement. She was appointed the Andrew W. Mathieson University of Pittsburgh Medical Center Professor of Family Medicine in April of 2005.

Dr. South-Paul maintains an active family medicine practice to include maternity care at the UPMC Matilda Theiss Clinic. Her research interests include maternal child health and fitness and evaluating cultural competence in clinicians and trainees.

Dr. South-Paul completed an internship and residency in family practice in 1982 at the Eisenhower Army Medical Center, Ft. Gordon, GA. In 1984, she completed a Family Medicine Faculty Development and Fellowship at University of North Carolina—Chapel Hill.

### **Professional Affiliations**

- President and Board Member, Society of Teachers of Family Medicine  
Uniformed Services University of the Health Sciences, EXPORT Advisory Board
- Member, World Organization of National Colleges of Family Physicians (WONCA) 2004 Scientific Program Committee
- Member, University of Wisconsin, Diversity Advisory Board
- Member, AAFP Future of Family Medicine Task Force
- Chair, Advisory Committee, AAMC and Commonwealth Fund Project for developing a Tool for Assessing a Cultural Competence Curriculum in Medical Schools (TACCT)
- Senior Advisor, AAFP Quality Care for Diverse Populations Project
- Member, AAMC Expanded Minority Admissions Exercise Advisory and Planning Committee
- Member, American Medical Association
- American Medical Women's Association
- National Medical Association
- Fellow, American Academy of Family Physicians
- Member, Christian Medical–Dental Association

## *Education Notes:*

### **The College of Medicine Integrated Curriculum – The Role of Pathology and Laboratory Medicine Educators** by Debra Hazen-Martin, Ph.D.

Within the past four years, dynamic improvements have occurred in the planning and management of the curriculum for Undergraduate Medical Education at our institution. Educators in our department have played a critical role in the process of curriculum change, reflecting the department's long-standing commitment to excellence in medical education. As we approach our January, 2013 LCME site visit for reaccreditation, a series of education notes will be posted to highlight the Integrated Curricular Structure and provide insight to the process of LCME review.

**History:** Curriculum reform was initiated at MUSC prior to the last LCME Self-Study in 2005. At that time, initial steps were made in centralization of curriculum management to facilitate adoption of institutional objectives and improve integration and coordination of effort between and among educators in the basic science and clinical sciences departments. A key element in this process was the designation of Faculty Curriculum Coordinators for the Years 1 and 2 educational planning and teaching. While initial efforts were aimed at reducing redundancy and improving the sequence of information in the curriculum, impediments to further progress were noted and included departmental tendencies to maintain independent, discipline-based approaches.



MUSC was reaccredited in 2005 for a period of seven years and immediately held an Educational Strategic Planning Retreat (April, 2005) to review the curriculum and plan for the future. At this retreat there was broad consensus and support for continued curricular change among clinical and basic science faculty. Strategic goals were developed, and in the one and one-half years following the Educational Strategic Planning Retreat (2005-2008) working groups of basic science and clinical faculty were appointed to meet regularly to discuss and formulate proposals for the structure of an integrated curriculum that would achieve the strategic goals utilizing the resources available at the Medical University of South Carolina.

### **Planning the Integrated Curriculum: Integrated Curriculum:**

In July 2008, Year One and Year Two Curriculum Integration Task Forces were formed to complete the planning and implementation of the Integrated Curriculum. Both Task Forces met weekly and reported progress to the Curriculum Committee of the COM. The Year 1 and Year 2 Task Forces were Chaired by **Dr. Debra Hazen-Martin** and **Dr. Erin Presnell**, the Faculty Curriculum Coordinators. Members were faculty leaders in education, including previous course directors and others with major long-standing teaching roles. Reorganization and realignment of effort resulted in designation of 2 individual Associate Deans for Curriculum for Basic Science and Clinical Science, Drs. Hazen-Martin and Donna Kern, in 2009. The two Associate Deans worked closely to fully implement the Integrated Curriculum and currently continue efforts in ongoing improvements. Subsequent appointment of the Associate Dean for Assessment and Evaluation in 2011 provided the means for ongoing objective assessment of student progress in the Integrated Curriculum and critical evaluation of the structure and function of the curriculum and the relationships between institutional objectives, curricular content, and outcomes.



*Dr. Debra Hazen-Martin*



*Dr. S. Erin Presnell*

**A New Funding Model for Education:** In January 2009, central financial support for the Integrated Curriculum was discussed and approved at a Mission Critical COM Leadership Retreat solidifying central funding of core educators in years 1 through 4. **Dr. Janice Lage** Co-Chaired the Task Force for Education and played a critical role in creating a central fund for education. This financial commitment was significant, in light of reducing state contributions to the MUSC budget and national fiscal constraints and has been responsible for invigorating and sustaining the process of change. The Dean of the College of Medicine set target dates for implementation of the Integrated Curriculum at academic years 2009-2010 and 2010-2011 for Year One and Year Two respectively.



*Dr. Janice Lage*

**The Integrated Curriculum:** The new curriculum was fully and successfully implemented on the target dates and Pathology and Laboratory Medicine Faculty members continue to provide key leadership for the Integrated Curriculum within Year 1 and Year 2 Planning and Evaluation Committees that work at the grass roots level within the current Integrated Curriculum structure. Each Committee has a designated Chair and members serve as longitudinal theme leaders and assumed responsibility for vertically integrated systems-based blocks in both years 1 and 2.

The members of these groups are deeply invested in education and are teachers as well as planners. As the groups worked to develop the theme and block structure, content was critically evaluated to identify redundancy that had existed in the previous traditional “silos/courses”. Members of the committee represented, and continue to represent, all of the disciplines and the desire to form the correct and most beneficial sequencing of information takes priority over “guarding of disciplines.” This process has addressed areas of deficiency resulting in appropriate addition of content and learning activities. Lectures are reformed with new integrated content, well-defined objectives, and a shortened format to promote active learning. Lecture hours were reduced ~25% to a maximum of 3 hours per day and the balance between lectures and other active learning activities is monitored with use of the teaching hours database.

**Year 1**




	Foundations of Biomedical Science	MSK System	CV Respiratory Systems	Renal GI Systems	UG Reproductive Systems	Cognition	
Structure and Function							Synthesis
Homeostasis and Regulation							
Molecules and Energetics							
Fundamentals of Patient Care							

The charge to both the Year 1 and Year 2 Planning and Evaluation Committees is to coordinate theme and block content, schedules, and teaching activities that align with institutional objectives. The committee oversees preparation and administration of block exams and other formative and summative assessment activities. The committees evaluate all themes and block content and make recommendations for ongoing curriculum improvement.

Theme leaders are responsible for identifying appropriate teachers for content in their respective areas and monitoring their teaching products and effectiveness. Six to eight times each academic year, the Year 1 and Year 2 Committees hold Joint Planning Meetings. At these working meetings focused content topics are discussed by committee members from each year who present “the map” of that topic throughout the 2 years. Discussion focuses on effective sequencing of that topic within the curriculum, changes to promote more effective learning and/or placement to enhance integration and application.

**Year 2**








	Foundations	Autoimmunity Neoplasia Hematologic Disease	Dermatologic Reproductive Endocrine Disease	Renal Cardio Pulmonary Disease	Psychiatric Neurologic Disease	Metabolic GI Disease	
Altered Structure and Function							USMLE Board Prep
Pathogens and Host Defense							
Pharmacotherapeutics and Nutrition							
Fundamentals of Patient Care							

*The next education note will review the process of LCME Accreditation – What to expect.*

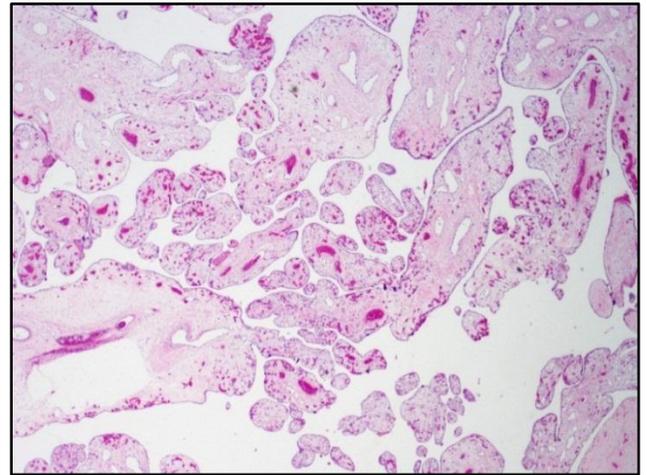


# PLACENTAL PATHOLOGY UPDATE

by Tihana Rumboldt, M.D.

Over the past 50 years the human placenta, considered the “diary of intrauterine life” by some and the “orphan child” of surgical pathology by others, has gradually become better understood. Consequently, many of its pathologic features that correlate with clinical findings and outcomes have become more clearly delineated and completely appreciated, including issues ranging from the relative timing of an event in gestation to the etiology of an intrauterine fetal demise or an apparent congenital defect. Furthermore, in-depth analysis and investigation of various aspects of placental pathology have allowed a more thorough understanding of many perinatal problems, such as birth asphyxia, cerebral palsy, and amniotic fluid infection, to name a few, and this information has been widely used to resolve medicolegal disputes. Some complications originally believed to be intrapartum events have been shown to predominantly arise earlier in gestation, and consequently a detailed pathologic study of the placenta has exonerated many obstetricians, maternal-fetal medicine (MFM) specialists, and neonatologists from unwarranted culpability following adverse outcomes. All these developments have led to an increase in demand for placental examinations, not only in problem pregnancies, such as with preterm birth, intrauterine growth restriction, and nonreassuring fetal status, but also in “routine” deliveries.

As perinatal mortality has decreased substantially over the past few decades, largely as the result of improved prenatal care and widespread use of ultrasonography, attention has become focused more sharply on the hypertensive disorders of pregnancy (preeclampsia) and the causes of prematurity. But as some diseases have evolved to become entities of primarily historical interest due to the advances of modern medicine, such as hemolytic disease of the newborn due to Rh isoimmunization, a number of all together new challenges have arisen, in part due to the advent of assisted reproductive technology (ART). These challenges relate to our incomplete understanding of the often complex placentation associated with multiple gestations, particularly the relatively common generation of multiple additional offspring resulting from the division of one or more of the transferred blastocysts.

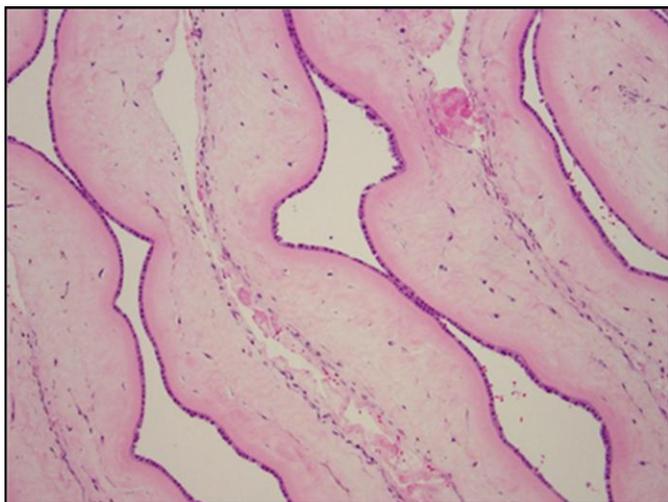


All of these additional complexities make it more important than ever to continue the trend of detailed pathologic study of the placenta, which was initiated in the early 1990s through the seminal report generated by the Working Group on Methods for Placental Examination of the College of American Pathologists (CAP).

For many years the placental pathology service at MUSC has been organized within the Surgical Pathology Service, functioning as a subspecialty sign-out activity. On this clinical service the placentas have been examined by pathologists with particular interest and expertise in placental and perinatal pathology. By virtue of additional subspecialty experience & training, these pathologists are better equipped to participate actively in the evolving field of placental pathology, thereby enhancing the communication among pathologists, obstetricians, MFM specialists, and neonatologists.

The volume of examined placentas has remained relatively stable since 2009 at approximately 1,000 specimens per year, and the quantity of specimens for pathologic examination, combined with the diversity of the disease processes manifested by these placentas, has provided a rich educational opportunity for the pathology residents in training. The Attending Pathologists provide introductory didactic sessions on placental pathology for new (first-year) residents during the first few months of their training, as well as consultation and guidance in the gross examination of difficult or problematic specimens. There is also the option to take an elective in placental pathology during the 3<sup>rd</sup> and 4<sup>th</sup> years to gain more proficiency and competence in examining placentas and products of conception. The senior residents on this elective also serve as “consultants” for the junior residents, who benefit from the experience of their senior colleagues.

Relatively recent developments include the addition of gross photographs of selected placental specimens, which are stored on the Moodle website; this feature allows cases to be used for presentations at the Multidisciplinary Fetal Board, the Perinatal Quality Conference, various resident teaching conferences and for presentations, posters, and publications.





# Lies, Damned Lies, Statistics, and Antibiograms

By Lisa L. Steed, Ph.D., D(ABMM)

Antibiograms are tables of cumulative antimicrobial susceptibility results that assist physicians in choosing the best **empiric** therapy for patients admitted to the hospital from the community. They should include clinically meaningful data and be simple to implement and interpret. JCAHO requires hospital laboratories to have the ability to collect and aggregate data and states that publishing an antibiogram is “good clinical practice”. CAP (College of American Pathologists) expects hospital-based laboratories to report antibiogram data to the medical staff at least yearly.

Guidelines for production of antibiograms were first published in 2002 by the Clinical Laboratory Standards Institute (CLSI) in an effort to enhance collection and analysis of data in all institutions. These guidelines have been updated twice, most recently in 2009, to address issues that have arisen about developing and presenting antibiograms. Data are typically presented as tables of % susceptible bugs vs. routinely reported drugs. Surveillance isolates are not included in the data as these isolates do not represent infections. Having national guidelines allows comparison of antibiogram data between institutions.

Let's use a hypothetical scenario to describe the ins and outs of how data for antibiograms are derived. A patient is admitted for bacterial pneumonia. Specimens are collected for laboratory analysis and the patient is started on empiric moxifloxacin. The patient's blood cultures and sputum culture grow *Streptococcus pneumoniae*. The patient improves but suffers a stroke, requiring intubation. Over the course of the patient's admission, multiple isolates of *Pseudomonas aeruginosa* are grown from various respiratory specimens. Some of these isolates are recovered from specimens submitted while the patient is in the ICU and other isolates are from non-ICU wards. For this one patient, the following data could be used for the antibiogram:

Day 0: Blood culture *S. pneumoniae* S = Augmentin, ceftriaxone, gatifloxacin, & vancomycin  
Sputum culture *S. pneumoniae* S = Augmentin, ceftriaxone, gatifloxacin, & vancomycin  
*Ps. aeruginosa* isolates from respiratory sources:

Day	Aztreonam	Cefepime	Piperacillin/ tazobactam	Gentamicin	Tobramycin	Ciprofloxacin
7	S	S	S	S	S	R
12	S	S	S	I	S	R
16	S	I	S	R	I	R
21	R	R	R	R	R	R

Which of these isolates for each organism should be included in the antibiogram? Our example patient has 2 *S. pneumoniae* isolates that represent the same infection and 4 *Ps. aeruginosa* isolates that may represent 1 to 4 infections. There is no single “correct” method to estimate susceptibility rates. Since an antibiogram is supposed to assist with **empiric** antibiotic choices, the currently recommended method is to use the first isolate. Other methods that have been used include using (1) all isolates, (2) isolate phenotype (would include first S, first I, and first R isolates), (3) the most resistant isolate per patient (i.e., a “worst case scenario”), (4) the most susceptible isolate per patient (i.e., a “best case scenario”), (5) first isolate per patient per time period (such as one week or one month), (6) the first isolate from each clearly defined infection episode, (7) first and last isolate per patient, and (8) most susceptible and most resistant isolate. In most cases, these alternative methods overestimate resistance due to patients with lengthy hospitalizations or who are frequently admitted and thus more likely to develop resistant isolates. In our example, aztreonam and piperacillin/tazobactam could be 100% susceptible, 75% susceptible, or 50% susceptible, depending on the method used. Likewise, cefepime could be 100% susceptible, 50% susceptible, or 33% susceptible, depending on the method used. Clearly, antibiogram data can be made to say anything the composer wants.

In order to enhance the confidence level of the data, only organisms with a minimum of 30 isolates a year are included on the antibiograms. After all, if one is trying to decide upon the best empiric antibiotic choice, statistically isn't a patient more likely to have a commonly recovered organism than one seen 10 times in a year? As one can see from Table H1 below if an organism has 30 isolates with a 90% susceptibility to a given antibiotic, the true susceptibility rate of that organism is between 73 and 98%. However, if an organism has 100 isolates with a 90% susceptibility to a given antibiotic, the true susceptibility rate of that organism is between 82 and 95%. Thus, the more isolates an organism has, the more confidence one can have of the accuracy of the % susceptibility given on the table.

**Table H1. 95% Confidence Intervals for Selected Sample Sizes**

Sample Size	Susceptible or Resistant Rate																	
	10%		20%		30%		40%		50%		60%		70%		80%		90%	
10	0	45	3	56	7	65	12	74	19	81	26	88	35	93	44	97	55	100
20	1	32	6	44	12	54	19	64	27	73	36	81	46	88	56	94	68	99
30	2	27	8	39	15	49	23	59	31	69	41	77	51	85	61	92	73	98
40	3	24	9	36	17	47	25	57	34	66	43	75	53	83	64	91	76	97
50	3	22	10	34	18	45	26	55	36	64	45	74	55	82	66	90	78	97
60	4	21	11	32	19	43	28	53	37	63	47	72	57	81	68	89	79	96
70	4	20	11	31	20	42	28	52	38	62	48	72	58	80	69	89	80	96
80	4	19	12	30	20	41	29	52	39	61	48	71	59	80	70	88	81	96
90	5	18	12	30	21	41	30	51	39	61	49	70	59	79	70	88	82	95
100	5	18	13	29	21	40	30	50	40	60	50	70	60	79	71	87	82	95
200	6	15	15	26	24	37	33	47	43	57	53	67	63	76	74	85	85	94
400	7	13	16	24	26	35	35	45	45	55	55	65	65	74	76	84	87	93
600	8	13	17	23	26	34	36	44	46	54	56	64	66	74	77	83	87	92
1000	8	12	18	23	27	33	37	43	47	53	57	63	67	73	77	82	88	92

To calculate the confidence interval for a particular drug-bug combination yourself use the following equation:

$$95\%CI = \%S \pm 1.96 \sqrt{\frac{\%S(1-\%S)}{N}}$$

There are three limitations of antibiograms. First, use of first isolates may prevent recognition of trends in emerging resistance, typically seen in subsequent isolates of an organism. Second, antibiograms cannot be used to guide empiric therapy of later infections with the same organism. Previous patient susceptibility profiles and antibiotic administration should be used instead. Finally, while antibiograms can be used to make recommendations as to appropriate empiric antibiotic choices, they should not be relied upon as substitutes for individual medical judgment.

So, what changes in %susceptibility for a specific drug-bug combination from year to year are significant? Many people would say a 10% change is significant. Alas, the true answer lies in how many isolates an organism has. As can be seen in Table H2, in order for an organism with an initial 80% susceptibility to an antibiotic, that organism would need to drop to 66% for 100 isolates, 60% for 50 isolates, or 45% for 20 isolates to be a statistically significant decrease.

For the first time, the 2011 antibiograms will include:

- hospital-wide systemic and urine antibiograms,
- pediatric units systemic and urine antibiograms,
- main hospital adult units systemic and urine antibiograms, and
- ART systemic and urine antibiograms.

The % susceptibility data for the 2011 antibiograms are re-calculated for each patient population. For example, a patient is admitted to the main hospital with an infection caused by organism X and later the same year is admitted to ART with an infection also caused by organism X. The hospital-wide antibiogram would include this patient's first isolate, while the main hospital antibiogram and the ART antibiogram would each include one isolate from this patient.

Unfortunately, using organisms with a minimum of 30 isolates makes patient population-specific antibiograms very brief. For example, the hospital-wide antibiogram includes data for seven Gram negative organisms while the main hospital antibiogram and ART antibiogram include data for only three Gram negative organisms.

**Table H2. Table to Use if % Susceptible Decreases**

Initial %S	Sample Size							
	10	20	50	100	200	400	600	1000
98	-	-	84	90	93	95	95	96
95	-	65	78	85	89	91	92	92
90	30	55	72	78	82	85	86	87
80	20	45	60	66	71	73	75	76
70	10	30	48	55	60	63	64	65
60	0	20	38	45	49	52	54	55
50	0	15	28	35	39	42	44	45
40	NS	5	20	25	30	33	34	35
30	NS	0	12	17	20	23	24	25
20	NS	NS	4	9	12	14	15	16
10	NS	NS	NS	2	4	5	6	7

NS - not significant

**Table H3. Table to Use if % Susceptible Increases**

Initial %S	Sample Size							
	10	20	50	100	200	400	600	1000
98	-	-	NS	NS	NS	100	100	100
95	-	NS	NS	NS	99	98	98	97
90	NS	NS	NS	98	96	95	94	93
80	NS	NS	96	91	88	86	85	84
70	NS	100	88	83	80	77	76	75
60	NS	95	80	75	70	67	66	65
50	100	85	72	65	61	58	56	55
40	100	80	62	55	51	48	46	45
30	90	70	52	45	40	37	36	35
20	80	55	40	34	29	27	25	24
10	70	45	28	22	18	15	14	13

NS - not significant

In order to provide clinically useful information, if the minimum 30 isolates do not occur in a specific patient population, the antibiogram for that population provides the number of isolates identified. Antibiogram information for organisms with less than 30 isolates can be obtained by emailing me.

Hospital-wide and adult antibiograms include typical adult IV dose and cost information. MUSC cost per day (NOT charges) does not include personnel or monitoring costs. Since cost information can be variable, costs are given as \$ (\$0-24), \$\$ (\$25-49), \$\$\$ (\$50-99), and \$\$\$\$ (\$100-270). For more information on antibiotic costs, call Pharmacy Outcomes at 792-8496.

Organism-specific breakpoint MICs are also provided on each antibiogram. Breakpoints are the MICs that allow interpretation into susceptible, intermediate, and resistant MIC values.

The antibiograms contain data for antibiotics routinely reported as approved by the Anti-Infective Subcommittee. Information for "hidden" antibiotics such as clindamycin or tetracycline can be obtained by emailing me.

The antibiogram includes a cumulative antimicrobial susceptibility report for anaerobic organisms that is generated from unique isolates from patient specimens submitted to Tufts New England Medical Center, Boston, MA; Loyola University Medical Center, Maywood, IL; and R.M. Alden Research Laboratory, Culver City, CA.

Finally, where can the 2011 antibiograms be found? In Oaxis in the lower right hand corner of any microbiology test. Please check them out and let me know what you think.

Reference:

Clinical Laboratory Standards Institute (CLSI). Analysis & presentation of cumulative antimicrobial susceptibility test data; approved guideline—3<sup>rd</sup> edition. CLSI document M39-A3. Wayne, PA: Clinical Laboratory Standards Institute; 2009.

## College of Medicine New Department Chairs



**Dr. Rita Ryan** joined us as a dual appointment with Pediatrics effective July 1, 2011. She is from the Buffalo campus of SUNY and serves as the new chair of the Department of Pediatrics.



**Dr. Lucian Del Priore** joined MUSC effective October 1, 2011 from Columbia University as the new chair of the Department of Ophthalmology.



**Dr. Don Rockey** will join MUSC on September 1, 2012 as the new Chair to the Department of Medicine. Dr. Rockey is coming from UT Southwestern Medical Center.

Drs. Ryan, Del Priore and Rockey bring an exceptional combination of clinical, teaching, research, and administrative skills to MUSC.



**APRIL 23-28. 2012**

**Pratt-Thomas Symposium in Surgical Pathology**

**Adam Bagg, MD**

Hospital of The University of Pennsylvania,  
Philadelphia, PA

**John R Goldblum, MD**

Cleveland, Ohio

**Peter A Humphrey, MD, PhD**

Washington University School of Medicine, St. Louis,  
MO

**David Lewin, MD**

Medical University of South Carolina, Charleston, SC

**Edward F McCarthy, MD**

Johns Hopkins University, Baltimore, MD

**Anthony Montag, MD**

Pritzker School of Medicine, The University of  
Chicago, Chicago, IL

**Marisa Nucci, MD**

Assistant Professor, Pathology, Brigham and  
Women's Hospital, Boston, MA

**Victor E. Reuter, MD**

Memorial Sloan-Kettering Cancer Center's Pathology  
Core Facility, New York, NY

**Wade Samowitz, MD**

University of Utah School of Medicine, ARUP  
Laboratories, Salt Lake City, UT

**Samuel A Yousem, MD**

University of Pittsburgh, Pittsburgh, PA

**McKee Cytology Seminar**

**Richard M DeMay, MD**

The University of Chicago Medical Center, Chicago,  
IL

**Michael R Henry, MD**

Mayo Clinic, Rochester, MN

**Martha B Pitman, MD**

Massachusetts General Hospital, Boston, MA

**Stephen S. Raab, MD**

Memorial University Hospital of Newfoundland

**Eva M. Wojcik, MD**

Loyola University Medical Center, Maywood, IL

**Gadsden-Holbrook Symposium in Clinical  
Pathology**

**Adam Bagg, MD**

Hospital of The University of Pennsylvania,  
Philadelphia, PA

**Elaine Mardis, PhD**

Washington University, St. Louis, MO

**Frederick S Nolte, PhD**

Medical University of South Carolina, Charleston, SC

**Jan A. Nowak, MD PhD**

Northshore University Health System

**Nicole T. Tanner, MD**

Medical University of South Carolina, Charleston, SC

**Dayna J Wolff, PhD**

Medical University of South Carolina, Charleston, SC

[mckee-seminar.musc.edu](http://mckee-seminar.musc.edu)