

Image analysis markups of cell detection and cell classification performed by Definiens Tissue Studio Algorithm on the immunofluorescently stained colon tissue with CD4 and RORC. From [Wallace et al. \(2021\), Cancer Prev. Res. 14\(9\):885-892.](#)

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A Note from the Directors



Don C. Rockey
DDRCC Director

As we start the second half of Year 2, we continue our planning for hosting the annual Silvio O. Conte DDRCC Director's meeting here in Charleston, **March 10-11th, 2022**. We are hopeful that it will be at least partially in person; this will depend upon our progress combating the SARS CoV-2 pandemic both locally and nationwide. Our ability to host will be a big boost to our prominence at a



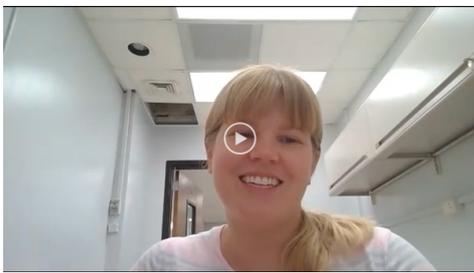
Stephen Duncan
CDLD Director

Research Focus

New Member Profiles

The Digestive Disease Research Core Center continues to welcome new members to our ranks. As part of our goal to build community and collaboration, we will be profiling some of these investigators to increase awareness of the increasing richness of scientific effort and thought in digestive disease here at MUSC. Please take a few minutes to welcome these newest members, and to learn more about their science.

Microvillus Inclusion Disease (MVID) and Cholestasis



Amy C. Engevik, PhD

Regenerative Medicine and Cell Biology Department

The world of rare congenital disease contains many nuances and genetic surprises. This is particularly so in the GI world, given the complex mechanisms that govern intestinal epithelial structure and function. In her video podcast, new faculty member Amy Engevik recounts her intellectual journey from her initial

[View the podcast](#)

[Contact Dr. Engevik](#)

studies of intestinal wound healing, through her postdoctoral training in the use of organoids as tools to study basic disease mechanisms and therapeutics, to her present research focus on the common secretory pathways affected in both intestinal and biliary disease.

Immune Contexture and Racial Disparities in Colorectal Cancer and Serrated Polyps



Kristen Wallace, PhD

Department of Public Health Sciences

A troubling finding of cancer outcomes studies is the notable differences in diagnostic and treatment outcomes found between different racial groups. Dr. Wallace has had a long-standing interest in understanding the factors that contribute to such disparities as viewed through the lens of population-level differences in tumor and pre-cancerous pathologies. In this

[View the podcast](#)

[Contact Dr. Wallace](#)

video podcast, she discusses her recently funded project ([R01CA226086](#)) geared towards the study of immune response pathology in a specific subset of precancerous lesions that to colon cancer. This will involve the collaborative examination of curated samples from a large biorepository representing a diverse patient population. She also discusses the benefits of her ongoing discussions with other MUSC DDRCC members that share mutual interests in colonic epithelial biology, cancer, inflammatory immunology and the microbiome.

Unable to view the podcasts? Please [email Kyu](#).

Notes from the DDRCC

New Grant Funding

Several DDRCC members have reported new grant awards this newsletter.
Thanks for sharing your updates, and congratulations to all for their
successful efforts!



Hongjun Wang, PhD (Surgery)

RO1 DK126454

Autologous BM-MSCs and Islet Co-transplantation to Enhance Islet Survival and Function in Total Pancreatectomy and Islet AutoTransplantation (TP-IAT)

08/24/21 05/31/26

[Click here to learn more about Islet Cell Transplantation at MUSC](#)



Denis Guttridge, PhD (Pediatrics)

PO1 CA236778

The Role of the Macroenvironment in Pancreatic Cancer-induced Cachexia

07/01/21 06/30/26



Zhi Zhong, PhD (Drug Discovery and Pharm)

R41 DK130707 (Lydex Pharmaceuticals, LLC)

Treatment of Liver Fibrosis With Oral Hepatic Stable and Non-genotoxic HDAC Inhibitors

08/06/21 - 07/31/22



Jihad Obeid, MD (Public Health Sciences)

R56 MH124744

Leveraging Deep Learning and Clinical Notes for Surveillance and Prediction of Intentional Self-harm and Suicide

05/01/21 04/30/22



Antonis Kourtidis, PhD (Regen Med)

NIGMS Developmental Research Program

Epigenetic and mRNA translational control mediated by adherens protein PLEKHA7

Austin Schull, PhD (Presbyterian College); Co-PI

09/01/21 08/31/22



Özlem Yilmaz, DDS, PhD (Oral Health Sci)

RO1 DE030313-02S1

Endothelial Metabolic Autophagy Mechanism of Vascular Dementia in Periodontopathic Infection

09/01/21 - 08/31/22

Awards and Other News



Mindy K. Engevik, PhD (Regen Med)

John R. Raymond Mentoring Fellowship

This one year award is intended to provide support for a full time woman faculty mameber to initiate a relationship with a mentor who is an expert in her chosen field.

In addition to receiving this award, Dr. Engevik has represented MUSC and the DDRC via invited seminars at several institutions:

- **Hopkins NIH Conte Digestive Diseases Basic & Translational Research Core Center (DDRCC).** Baltimore, MD. "Exploring microbial interactions at the mucosal interface."
- **University of Pennsylvania Perelman School of Medicine DDRCC.** Phila, PA. "*Investigating microbial interactions at the mucosal interface.*"
- **University of Illinois College of Medicine.** Chicago, IL. "*That Gut Feeling: Linking gut microbes with neurotransmitters.*"
- **Howard University.** Washington, DC. "*Mapping communication between the gut and the brain using gnotobiotic mice.*"

We like to hear about your progress and achievements!

Please send your news and announcements to the DDRC Digest via email to the [Center Manager](#).

Updates from Our Cores

Several of our core leaders have been awarded equipment grants and supplements that will enhance the capabilities and services available to DDRC members. Thanks and well done!

CDLD Animal Core



Steve Duncan, DPhil (Regen Med)

P20GM130457-02S1

CDLD Administrative Supplement for Equipment

This funding will provide for more specialized caging units and an expanded Gnotobiotic Animal Facility.

Proteomics Core



Peggi Angel, PhD (Pharmacology)

S10 OD030212

Bruker scimaX Magnetic Resonance Mass Spectrometer

This instrumentation grant will fund the purchase of a Fourier Transform Ion Cyclotron Resonance Mass Spectrometer to support tissue scanning MS for N-glycosylation, ceramide signaling, collagen type turnover and post-translational modification.



Lauren Ball, PhD (Pharmacology)

S10 OD028692

Quadrupole Orbitrap Hybrid Mass Spectrometer for Proteomics

This instrumentation grant will fund the purchase of a Quadrupole Orbitrap Hybrid Exploris 480 Mass Spectrometer to upgrade, supplement and support current quantitative LC-MS/MS capabilities for the core.

Look for future updates from the Proteomics Core about the new capabilities that will be supported by these instruments!

Imaging Core



Monika Gooz

Chan Zuckerberg Award

Monika Gooz, M.D., Ph.D. received the Chan Zuckerberg Imaging Scientist Award from the Silicon Valley Community Foundation. The project entitled “Comprehensive Imaging Education in Biomedical Sciences” will serve the dual purpose of providing comprehensive education in imaging, while at the same time building reliable databases for further AI based platform developments. Due to her involvement with this new project, she will be stepping down as Center Manager for the Imaging Core. Congratulations and best wishes for this new endeavor!

Imaging Core Leadership Update



John J. Lemasters
Director



Anna-Liisa Nieminen
Assistant Director



Li Li
Core Manager



Jiangting Hu
Imaging Specialist

With the departure of Dr. Gooz as Center Manager, the DDRCC and CDLD Imaging Core will undergo reorganization. **Li Li, PhD**, will assume the position of Core manager, and will serve as the principal contact for DDRC member seeking assistance with imaging.

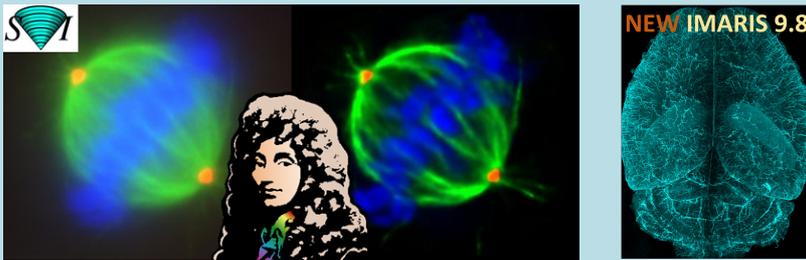
Services include consultation and assistance concerning experimental design, sample preparation, probe selection and data collection (assisted imaging) and analysis for imaging applications. Users can get in-depth training in multiple imaging modalities, and education in the fundamentals of imaging and image analysis technologies. **DDRCC Full Members receive a 25% discount on Imaging Core fees.**

The following applications are available for users:

- **Live Cell Imaging** of parameter-sensitive fluorophores to monitor ions, electrical potentials, oxygen and nitrogen radical generation, NAD(P)H, mitochondrial and plasmalemmal membrane permeability, cell viability (apoptosis and necrosis), fluorescent protein biosensors and other parameters.
- **Intravital Microscopy** to monitor microcirculation, leukocyte margination, invadopodia, mitochondrial polarization, membrane permeability, radical generation, gene expression, detection of collagen fibers and other factors in living animals and tissues.
- **Advanced Imaging Techniques:** Fluorescence resonance energy transfer (FRET) and fluorescence recovery after photobleaching (FRAP) to characterize and quantify interactions between specific molecules and their mobility; second harmonic generation (SHG) and polarization microscopy for label-free visualization of collagen; Fast Airyscan super-resolution imaging with high quantum efficiency GaAsP photomultipliers.
- **Image Analysis:** Three imaging workstations are dedicated for image processing and analysis. Site licenses are maintained for Zeiss Zen software, Imaris 3D/4D interactive microscopy image analysis software and for Huygens advanced deconvolution suite. Other available image analysis software includes Metamorph, Image J FIJI, Duolink ImageTool, Adobe Photoshop, Olympus Viewer, and IP Lab.

State of the art equipment includes:

- Zeiss LSM 880 NLO confocal/multiphoton microscope with Fast Airyscan super-resolution and Quasar spectral detectors and light-tight CO2 incubator for live cell imaging
- Olympus FluoView 1200 MPE intravital multiphoton microscope
- Olympus FluoView Fv10i confocal microscope
- BD Biosciences CARV II real-time spinning disk confocal microscope
- Zeiss LSM 510 META confocal/multiphoton microscope
- Zeiss Axiovert 200M microscope
- Biotek high throughput/high content imaging system



The Imaging Core recently purchased new modules for their **Huygens deconvolution software** that will allow for PSF (Point Spread Function) measurement and wide-field image deconvolution to significantly improve image clarity. This software can be used by individual lab-owned wide-field microscopes as well. The Imaging Core also updated their Imaris imaging software to the latest available version.

DDRCC and CDLD Enrichment Seminar Series

We were privileged to host an outstanding series of virtual seminars this year, featuring speakers of national and international renown. All of the GI & Hepatology 7am series were recorded, and are available through Box. A few notable highlights are mentioned below. The complete collection of recorded talks are available to DDRCC and CDLD members [here](#).

DDRCC / CDLD / GI and Hepatology Grand Rounds:
Wednesday, 7am EST (Zoom)

October 6

GI & Hepatology Fellows MUSC

Clinical case presentations

October 13

Michael P. Manns, MD Hannover Medical School, Hannover, Germany

Artificial intelligence in hepatitis

October 20

Paul Fockens, MD, PhD Universiteit van Amsterdam

Management of papillary adenomas

October 27

Florence Wong, MD University of Toronto

An update on the treatment of ascites in cirrhosis: is it drains, or TIPS or pump?

November 3

William Chey, MD University of Michigan

Integrated care models of IBS – what, why and how

November 10

GI & Hepatology Fellows MUSC

Clinical case presentations

November 17

John Morris, MB, ChB Glasgow University Medical School

Lesion detection and decision making in UGI neoplasia

November 24

Anna Lok, MD University of Michigan

Hepatitis B virus

DDRCC/CDLD/ RMCB Virtual Seminar Series:

Wednesday, 11 am EST (Zoom)

October 6

Mindy Engevik, PhD MUSC - Regenerative Medicine and Cell Biology

First contact: the role of the intestinal mucus layer in microbiota-host interactions

October 13

Kathryn E. Hamilton, PhD University of Pennsylvania

IMP-licating RNA binding proteins in intestinal epithelial regeneration

October 27

Mark R. Frey, PhD University of Southern California

TBA

November 3

Amy Engevik, PhD MUSC - Regenerative Medicine and Cell Biology

Dissecting the role of Myosin Vb in mucus and drug efflux

November 10

Wayne Lencer, MD Harvard Medical School

C1ORF106/INAVA – dual and competing functions for an IBD-risk gene enriched in barrier epithelial cells

To receive notifications for our Enrichment series seminars, please contact the DDRCC Center Manager.

Selected GI Publications by our Members

Each newsletter, we highlight a subset of the many outstanding papers published and presented by our DDRCC members. We strive to mention particularly significant primary research papers where our members were lead authors or key contributors, and to represent the broad scope of clinical, basic science and clinical-translational research interests across our membership. To assist us in these efforts, we continue to encourage you to [email Kyu](#), our center manager, about your particularly significant papers and presentations.

While space does not allow us to list a comprehensive month-to-month list of our member publications, such a list can be found on our DDRCC website [here](#).

A complete listing of our DDRCC member publications since its inception can also be found through NCBI [here](#).

August, 2021 - September, 2021

Sobotka LA, Esteban J, Volk ML, **Elmunzer BJ**, **Rockey DC**. Acute Liver Injury in Patients Hospitalized with COVID-19. Dig Dis Sci. 2021 Sep 6/. PubMed PMID: 34487314; PubMed Central PMCID: PMC8419385.

Ramsey ML, **Elmunzer BJ**, Krishna SG. Serum Lipase Elevations in COVID-19 Patients Reflect Critical Illness and not Acute Pancreatitis. Clin Gastroenterol Hepatol. 2021 Sep;19(9):1982-1987. PubMed PMID: 33882344; PubMed Central PMCID: PMC8053356.

Wallace K, El Nahas GJ, Bookhout C, Thaxton JE, Lewin DN, Nikolaishvili-Feinberg N, Cohen SM, Brazeal JG, Hill EG, Wu JD, Baron JA, **Alekseyenko AV**. Immune Responses Vary in Preinvasive Colorectal Lesions by Tumor Location and Histology. *Cancer Prev Res (Phila)*. 2021 Sep;14(9):885-892. PubMed PMID: 34341013.

Kaji I, Roland JT, Rathan-Kumar S, **Engevik AC**, Burman A, Goldstein AE, Watanabe M, Goldenring JR. Cell differentiation is disrupted by MYO5B loss through Wnt/Notch imbalance. *JCI Insight*. 2021 Aug 23;6(16). PubMed PMID: 34197342; PubMed Central PMCID: PMC8409988.

Forbes N, Leontiadis GI, Vaska M, **Elmunzer BJ**, Yuan Y, Bishay K, Meng ZW, Iannuzzi J, O'Sullivan DE, Mah B, Partridge ACR, Henderson AM, Qureshi A, Keswani RN, Wani S, Bridges RJ, Heitman SJ, Hilsden RJ, Ruan Y, Brenner DR. Adverse events associated with endoscopic retrograde cholangiopancreatography: protocol for a systematic review and meta-analysis. *BMJ Open*. 2021 Aug 17;11(8):e053302. PubMed PMID: 34404717; PubMed Central PMCID: PMC8372880.

Cen B, Wei J, Wang D, Xiong Y, Shay JW, **DuBois RN**. Mutant APC promotes tumor immune evasion via PD-L1 in colorectal cancer. *Oncogene*. 2021 Aug 12. PubMed PMID: 34385594; NIHMSID:NIHMS1726116.

Ball LE, Agana B, Comte-Walters S, **Rockey DC**, Masur H, Kottlil S, **Meissner EG**. Hepatitis C virus treatment with direct-acting antivirals induces rapid changes in the hepatic proteome. *J Viral Hepat*. 2021 Aug 11. PubMed PMID: 34379872; NIHMSID:NIHMS1732695.

Fontana RJ, Stravitz RT, Durkalski V, Hanje J, Hameed B, **Koch D**, Ganger D, Olson J, Liou I, McGuire BM, Clasen K, Lee WM. Prognostic Value of the 13 C-Methacetin Breath Test in Adults with Acute Liver Failure and Non-acetaminophen Acute Liver Injury. *Hepatology*. 2021 Aug;74(2):961-972. PubMed PMID: 33660316.

Accessing DDRCC Cores

Quick Links for DDRCC and CDLD Core Use

A reminder that Full Members receive subsidized usage of our [cores](#). Below are some summary details for accessing the cores and initiating projects.

Analytical Cell Models Core:

- The DDRCC and CDLD both **fully subsidize** the use of the ACC by its members.
- For iPSC projects, please contact the Core Director, **Dr. Steve Duncan**.
- For primary cell isolation, please contact **Dr. Don Rockey**.

Advanced Imaging Core:

- The DDRCC and CDLD both provide **full members** with a **25% discount** on facility fees.
- For imaging projects, please contact the Core Director, **Dr. John Lemasters** and Core Manager **Li Li**.

CDLD Animal Models Core:

- The CDLD **fully subsidizes** the use of the Animal Models Core for its **Junior Investigators**.
- Other **discounts** may currently apply for DDRCC members.
- For animal projects please contact the Core Director, **Dr. Suzanne Craig**.
- For gnotobiotic mouse models, please contact **Dr. Caroline Westwater**.
- For transgenic and CRISPR/Cas9 projects, please contact the TGE Director, **Dr. Alexander Awgulewitsch**.

DDRCC Proteomics Core (updated):

- **DDRCC full members** will now receive a **50% discount** from facility fees.
- For MS projects, please contact the Core Co-Director, **Dr. Lauren Ball**.

Clinical Component Core:

- The DDRCC and CDLD **fully subsidize** biostatistical consultations with the Clinical Component Core by all of its members, including biostatistical support and mentoring for its Junior Investigators and Pilot & Feasibility applicants and awardees.
- To start a project, visit the **SPARC website** and submit a Biostatistics, Design & Epidemiology request, and contact:
 - DDRCC Core Director, **Dr. Paul Nietert**
 - CDLD Director **Dr. Ramesh Ramakrishnan**.

CITE OUR GRANTS

FOR THE DDRCC:
P30 DK123704

FOR THE COBRE CDLD:
P20 GM120457

This project was supported in part by NIH P30 **DK123704** (core facility) at the MUSC Digestive Disease Research Core Center.

This project was supported in part by NIH P20 **GM120475** (core facility) at the MUSC Digestive Disease Research Core Center.

For queries regarding DDRCC news, membership and cores, please contact the Center Manager:

Kyu-Ho Lee, MD-PhD

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Department of Medicine

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Charleston, SC 29425

(843) 792-1689

[Email Dr. Lee](#)

For queries regarding the COBRE in Digestive and Liver Disease, please contact the COBRE PI:

Stephen Duncan, DPhil

Department Chair

Regenerative Medicine and Cell Biology

BSB 657A MSC508

173 Ashley Ave

Charleston, SC 29425

(843) 792-9104

[Email Dr. Duncan](#)

Visit the DDRCC Website:

<https://medicine.musc.edu/departments/dom/divisions/gastroenterology/research/labs-and-centers/ddrcc>

Visit the CDLD Website:

<https://medicine.musc.edu/departments/regenerative-medicine/cobre-digestive-liver-disease>



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