



THE DDRC DIGEST

Quarterly Newsletter

Digestive Disease Research Center

Medical University of South Carolina

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Greetings from our Directors

Dear Colleagues: It is a great pleasure to launch our efforts to expand MUSC's presence in digestive disease research. In this inaugural issue of the DDRC newsletter, we will spotlight the structure and complimentary functions of the NIDDK P30-funded DDRCC and NIGMS P20-funded COBRE. You will see below the core thematic research areas on which the programs are focused and introduce key research resources for our growing cadre of digestive and liver disease investigators. Going forward, our goal with this newsletter is to keep you informed of infrastructure developments, notable accomplishments of our members, and future enrichment events geared toward growing the research base and the overarching digestive disease program.

Digestive Disease Research Core Center

P30 funding of the DDRCC brings \$6 million from the NIDDK to support digestive disease research at MUSC, one of only 17 such grants in the US. Overall, these funds will increase availability of resources for members and foster collaborations in digestive and liver disease. The theme of the grant includes essentially all components of the disease - from cellular injury pathways leading to inflammation, fibrosis, malignancy, and end organ disease. The ultimate goal of the grant is to support funded and established core members of the DDRCC, and to help develop and nurture collaboration and science within the institution.

Center Directors



Don Rockey

Dr. Rockey is Director of the Digestive Disease Research Core Center funded by **NIDDK P30 DK123704**



Steve Duncan

Dr. Duncan is Director of the COBRE in Digestive and Liver Disease funded by **NIGMS P20 GM130457**

COBRE in Digestive and Liver Disease

Funded through an \$11 million P20 project grant from NIGMS, the COBRE in Digestive and Liver Disease (CDLD), has a similar disease focus to the DDRCC, and supports research in the areas of: 1) Inflammation and Fibrosis; 2) Metabolic Disease; and 3) Cancer. In contrast to the DDRCC, which supports funded investigators, the CDLD is geared toward the mentoring and development of early career scientist in digestive and liver disease. By providing mentoring, priority access to CDLD cores and guidance in grant writing and career development, the COBRE seeks to establish a robust pipeline of junior investigators joining the DDRCC.

DDRCC Membership Categories

Full Members

- Actively conducting research in GI and liver disease
- PI on extramural peer-reviewed funded grant(s) in an area relevant to digestive and liver disease
- Have relevant publications in peer-reviewed journals
- Are active participants in DDRCC meetings and events and use of DDRCC cores
- DDRCC core directors and current Pilot and Feasibility (P&F) project PIs are automatically Full Members
- **Benefits:** Priority access to DDRCC cores; co-payments for core usage; P&F awardees receive free core services.

Associate Members

- Have relevant publications in peer-reviewed journals
- Have not yet obtained peer-reviewed funding in digestive and liver disease
- Have peer reviewed funding not directly related to digestive or liver disease, but have a committed interest in pursuing such research
- Are active participants in DDRCC meetings and events and use of DDRCC cores
- P&F awardees are automatically granted membership for up to three years.
- **Benefits:** co-payments for core usage

Obligations: All members are expected to actively participate in Enrichment Program Activities. Full members must use and acknowledge core support where appropriate in their research publications and new grant submissions.



DDRCC Organization and Membership

The DDRCC is focused on supporting its full member research base (see the table to left). Toward this end, the grant will provide support for several state-of-the-art resources and services for these investigators and their digestive and liver disease-themed research:

1. Analytical Cell Models Core. This new core will generate both primary liver cells and human induced pluripotent stem cells (iPSC) for use in normal cell and cell injury models. Available expertise in genome engineering will facilitate introduction of specific genetic mutations associated with GI and liver disease in cells differentiated from iPSCs.

2. Advanced Imaging Core. This core aims to provide DDRCC investigators with technologies, expertise, and training for quantitative cell- and tissue-based imaging and analyses. These include super-resolution imaging of fluorophores, and other high-end high resolution fixed-static and intravital microscopy. The core will also supply routine morphology and staining services to members, as well as hands-on training in the use of specialized microscopic equipment.

3. Proteomics Core. The Proteomics core will provide state-of-the-art mass spectrometry-based proteomic capabilities to DDRCC investigators. It will provide mass spectrometry to allow the discovery of the effects of drugs/ligands, genetic alterations, and disease on changes in protein expression, protein interactions, and post-translational modifications. As a highly unique and innovative component, it will provide MS-imaging for the analysis of metabolites, lipids, glycolipid and glycans in tissue.

4. Clinical Component. The aim of this core is to provide a research support infrastructure of biostatisticians and research operations team members to promote efficiencies in the design, implementation and analysis of research studies. This will include both basic science research as well as clinical research. The team will work closely with their partners on the design, planning and conduct of their research efforts.

Look for more detailed descriptions of the cores, access and services in future editions of the DDRCC Digest.

CDLD Core resources:

- 1. Cell Models Core***: Providing primary liver cells and wild-type and genetically modified iPSC and differentiated gut and liver cells.
- 2. Advanced Imaging Core***: High-end microscopy and instrument training support.
- 3. Animal Models of Digestive Disease Core**: providing services and support for creating and using surgical and microbiological animal (primarily mouse) platforms for modeling GI and liver disease. This facility encompasses a cutting-edge Gnotobiotics facility, as well as the Transgenic and Gene Editing core.
- 4. Biostatistics Support**: Provides consultation for design and analysis for all CDLD-supported projects.

* shared resource with the DDRCC

Core Resources of the CDLD. JIs will receive mentoring on research program development, skills acquisition and career advancement through interactions with a primary mentor, the EC, core directors, the EAC, and peer interactions at monthly CDLD Research meetings. They will also have free use of several core resources, some shared with the DDRCC (above).

Shared DDRC Programs

The DDRCC and CDLD will share two common programs geared toward increasing awareness and presence of digestive and liver disease research in the broader MUSC community.

Pilot and Feasibility Program. The objective of the P&F program is to foster the pursuit of basic, clinical, or translational research of diseases affecting liver and/or gastrointestinal system at MUSC. The program provides and prioritizes short-term funding through several mechanisms (right) for scientifically meritorious and innovative projects through a competitive program with open solicitation, peer review, and funding. Proposed projects should have a high likelihood of progression to extramural funding and directly utilize one or more of the CDLD and/or DDRCC Core Resources. A major focus of the Program is to promote multidisciplinary collaboration and a strong supportive scientific network primarily for New Investigators.

CDLD Organization and Function

While the DDRCC program supports established investigators, the CDLD is geared toward the development of **Junior Investigators** committed to a career in digestive and/or liver disease. The CDLD is thus centered on its Junior Investigator program.

Selection and mentoring of Junior Investigators (JIs). The program supports a cohort of four JIs, who are primarily recruited from an institutional pool of current MUSC junior scientists (basic scientists, clinician scientists, translational scientists) whose research is focused on GI and/or Liver Disease. The CDLD will also consider qualified investigators from other South Carolina research campuses. Following solicitation of letters of intent (LOI) and invitation of full applications, funding decisions will be made by the CDLD Executive Committee (EC), in consultation with the CDLD External Advisory Committee (EAC).

JIs will be supported for a term of up to 3 years, contingent upon satisfactory progress and yearly assessments. Successful JIs can also “graduate” from the program once they are awarded independent RO1 funding as PIs, making available funding slots for future JIs. Successful CDLD graduates will then continue to be supported as Full Members in the P30 DDRCC.

Early Career Pilot: Discovery grants for new investigators within 6 years of their first full-time faculty appointment (up to \$50k/1 yr).

New Direction Pilot: High impact/high risk project in GI and liver disease representing a significant departure from a PIs normal research program, open to faculty of any rank (up to \$35k/1 yr)

Feasibility Grants: High impact/high risk projects for established digestive and liver disease researchers and faculty of any rank (up to \$25k/1yr)

Collaborative Pilot. Projects stimulating GI and liver disease research collaboration at MUSC or MUSC and other institutions (up to \$35k/1 yr)

Applications have already been accepted for the current cycle P&F award cycle and are currently under review and funding decisions will be made soon by the EC and EAC.

Enrichment Program. The goal of the joint DDRCC and CDLD Enrichment Program is to expand interest in and development of digestive disease and liver research on campus as well as within the DDRCC and CDLD communities. The program includes a Seminar Series featuring presentations from renowned investigators whose research in basic, translation and clinical arenas exploit innovative approaches in the study and treatment of digestive and liver disease.

The program also includes an annual retreat inviting all MUSC and digestive and liver disease investigators. In addition to poster and platform presentations, the retreat will feature of keynote speaker of national prominence in digestive and liver disease. The goals of this retreat are to provide a platform for DDRCC and CDLD investigators to present their research findings, encourage collaborations among digestive and liver disease investigators, and provide insight and feedback into the services offered by the DDRCC and CDLD cores to its membership and the larger MUSC community.

Due to the COVID pandemic, current plans for the Annual Retreat are still under development. Updates on the retreat and other activities of the Enrichment Program will be disseminated through our established campus-wide electronic mailing list and website.

For further details about the P&F program and future RFAs, please contact the Pilot Project Director:

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Visit the MUSC Digestive Disease Research Center website:

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

