TOTAL = ~$ 11.3 M
is honored to host the...

Clemson University School of Health Research (CUSHR)
Fall 2016 Meeting

Welcome!
COLLEGE OF SCIENCE

BY THE NUMBERS

- Founded July 1, 2016; Dean: Dr. Mark Leising, Ph.D.
- 5 Departments (Biological Sciences, Chemistry, Genetics & Biochemistry, Mathematical Sciences, Physics & Astronomy)
- ~217 Faculty (TTT & Lecturers)
- ~2970 Students (2400 UG & 570 G)
- ~58,000 Seats & 149,000 student credit hours
FY16
RESEARCH EXPENDITURES

- Biotechnology & Biomedical Sciences
- Sustainable Environment
- Advanced Materials
- General Education
- Inform. & Comm. Technology
- Family and Community Living

TOTAL = ~$11.3 M
Center for Human Genetics
OTHER DISEASES, TREATMENTS & HUMAN PHYSIOLOGY

- Environmental toxins & gall-bladder disease or development
- Nanoparticle-based treatment for Type II Diabetes
- Neural Stem Cells & Brain Development
- Modeling Ischemia/Reperfusion Injury & Health-Care Statistics
- Cancer Immunotherapy
- Physics of cell motility
NEW TECHNOLOGIES

- Novel Devices for Stereotactic Radiosurgery
- pH-controlled drug delivery systems
- Novel Sensors for Medical Imaging/Single Molecule
- Fluorescence-based sensors for neurotoxins
- Microfluidic devices for monitoring biological activity
- New materials for Diagnostics & Materials/Biologicals Interactions
CUSHR Fall Information Exchange Agenda

8:00 - 8:15  Coffee and Conversation [Posters on display]
8:15 - 8:20  Welcome and Introductions
8:20 - 8:40  CUSHR Updates
8:40 - 8:50  College Spotlight
             College of Science
             Lesly Temesvari, PhD
8:50 - 9:10  Collaboration Opportunity Spotlight
             GHS Department of Pediatrics
             Desmond Kelly, MD
             Vice Chair for Academics
9:10 - 9:15  Announcements
9:15 - 9:30  Collaboration connections [Posters on display]
9:30 - 10:00 Posters will remain on display until 10 AM for folks to mingle and explore new connections.
CUSHR Introduction: Jean McKendry, PhD

Jean E. McKendry, Ph.D.
Coordinator of Grant Development & Interdisciplinary Collaborations
Center for Research and Collaborative Activities (CRCA)
Division of Collaborative Academic Services
College of Behavioral, Social and Health Sciences
College of Education
Clemson University
jmckend@clemson.edu
864-656-1728 (o)
skype: jean.e.mckendry

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403-A Edwards Hall
Clemson University
Clemson, SC 29634
NIH & AHRQ changes to grant guidelines

• Rigor and transparency in research grant applications
• Vertebrate animals (NIH only)
  – new euthanasia questions on the PHS 398 Cover Page Supplement and PHS Fellowship Supplemental forms
• Inclusion (new PHS Inclusion Enrollment Report form)
• Data Safety Monitoring Plan (new for clinical trials)
• Research Training (new tables)
• New PHS Assignment Request Form (peer review)
• New font guidelines
• Biosketch clarifications

<table>
<thead>
<tr>
<th>4 AREAS OF FOCUS</th>
<th>WHAT DOES IT MEAN?</th>
<th>WHERE SHOULD IT BE INCLUDED IN THE APPLICATION?</th>
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</table>
| Scientific Premise | The **scientific premise** for an application is the research that is used to form the basis for the proposed research question(s). Describe the general strengths and weaknesses of the prior research being cited as crucial to support the application. Consider discussing the rigor of previous experimental designs, as well as the incorporation of relevant biological variables and authentication of key resources. | **Research Strategy**  
➢ **Significance** |
| Scientific Rigor (Design) | **Scientific rigor** is the strict application of the scientific method to ensure robust and unbiased experimental design, methodology, analysis, interpretation and reporting of results. Emphasize how the experimental design and methods proposed will achieve robust and unbiased results. | **Research Strategy**  
➢ **Approach** |
| Biological Variables | Biological variables, such as sex, age, weight, and underlying health conditions, are often critical factors affecting health or disease. In particular, sex is a biological variable that is frequently ignored in animal study designs and analyses, leading to an incomplete understanding of potential sex-based differences in basic biological function, disease processes and treatment response. Explain how relevant biological variables, such as the ones noted above, are factored into research designs, analyses, and reporting in vertebrate animal and human studies. Strong justification from the scientific literature, preliminary data or other relevant considerations must be provided for applications proposing to study only one sex. | **Research Strategy**  
➢ **Approach** |
| Authentication | **Key biological and/or chemical resources** include, but are not limited to, cell lines, specialty chemicals, antibodies and other biologics. Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies. These resources may or may not be generated with NIH funds and:  
● may differ from laboratory to laboratory over time;  
● may have qualities and/or qualifications that could influence the research data;  
● are integral to the proposed research. The authentication plan should state in one page or less how you will authenticate key resources, including the frequency, as needed for your research. Note: Do not include authentication data in your plan. | **Other Research Plan Section**  
➢ Include as an attachment  
➢ Do not include in the Research Strategy. |

*See related FAQs, blog posts, examples from pilot results*
CUSHR Update: Appointment Committee

Updates:
Spring: Faculty Scholar Appointments
42 new Faculty Scholars appointed in Spring 2016

Fall: Clinical Faculty Appointments
2016 Clinical Faculty appointments are currently under review.

TOTALS:
114 Faculty Scholar Appointments
38 Clinical Faculty Appointments

CUSHR Appointment Committee:
• Lawrence Fredendall, Chair
• Thomas Britt
• Susan Chapman
• John DesJardins
• Cheryl Dye
• Kevin Taaffe
• Margaret Ann Wetsel
• Windsor Sherrill
• Kerry Smith
CUSHR Website and Profiles

Welcome to the Clemson University School of Health Research

Better Together

This is the home of a bold partnership between Clemson University and health care systems that have created the Clemson University School of Health Research (CUSHR), a multidisciplinary team of Clemson that facilitates medical research and scholarship. Through this partnership, Clemson brings a wealth of research and educational expertise, and the health care systems offer the clinical opportunities students and researchers need to put their ideas into action. The result is breakthroughs in health care delivery, access, and affordability that make a difference in the doctor’s office, the operating room, and beyond.

Events

October 28, 2018 — CUSHR Fall Meeting in Clemson 8-9:30 a.m. at TMC Seminar Room G-100. (The building is across the parking lot from the front doors of the Hendrix Student Center.)

Faculty Scholars

Apparao M. Rao, Ph.D.

R.A. Bowen Professor

Department of Physics and Astronomy

Clemson University

Contact: 864-656-0719 or aro@clemson.edu

Who is Professor Rao?

Apparao Rao is currently the R.A. Bowen Professor of Physics and a fellow of the American Physical Society and AAAS. He received his PhD in physics from University of Kentucky in 1990 and subsequently served as a post-doctoral research associate at MIT until 1991. Later, he joined University of Kentucky as a research assistant professor before coming to Clemson in 2000. His laboratory is dedicated to understanding the atomic, magnetic, electrical, optical, and biophysical/ biochemical properties of micro- and nano-structured materials. Professor Rao’s research interests include the characterization and applications of carbon nanotubes, semiconductor nanowires, nanowires, and thermoelectric materials. His group’s strength lies in the ability to synthesize several nano-structured materials using various growth techniques such as chemical vapor deposition and pulsed laser ablation and explore the fundamental physics in nanostructured systems using a wide range of characterization techniques such as Raman scattering, infrared, UV-visible, fluorescence, nonlinear optical spectroscopy, harmonic detection of resonance method, atomic force microscopy, electron microscopy and electrical transport measurements. In addition to two grants from NSF and one grant from DOE/SEC, he is presently serving as the principal investigator on NIN/NEMS SBIR grant to understand the interactions of nanomaterials with biomolecules.

How Professor Rao’s research is transforming health care

The advancement of nanotechnology applications in many fields such as health care, energy, and transportation relies on the resolution of the potential toxicity of EMI materials to living organisms and the environment. For instance, there are more than 40 nanopharmaceuticals in routine clinical use and many more nanoparticles or cancer treatment are in the pipeline for approval. Despite concerns about the efforts in nanotechnology, there is still a wide gap in the understanding of how EMI interactions with living organisms. His research focus at Clemson is elucidating the fundamental interactions between nanomaterials and biomolecules. This research will ultimately help the bench-to-bedside transition of nanomedicine.

Health Research Expertise Keywords

Biophysics, Nanoparticles, Cancer Screening, Drug Delivery, In-vitro Experimentation, Safety
CUSHR Update: CUSHR Fall Mixer

73 Clemson Attendees
6 Colleges
24 Departments

45 GHS Attendees
9 Academic Vice Chairs
GHS leaders from Academics, Accountable Communities, Corporate, Nursing, Research Development, and more.

Event booklet available at http://www.clemson.edu/health-research/events.html
The first annual Harriet and Jerry Dempsey Research Conference was held at GHS on Friday, September 30.

Thank you to Dempsey Professors, Drs. Kevin Taaffe and Dan Simionescu, for hosting this great research event.
Building Collaboration

Models of Embedded Scholarship

**EMBEDDED POSTDOCTORAL SCHOLARS**
- Junior Faculty
- 1-2 years full time within a department at GHS

**FACULTY FELLOWS**
- Senior Faculty “Sabbatical Model”
- 3 days per week at GHS for one summer and academic term

**NAMED PROFESSORSHIPS**
- Senior Faculty
- 3 years of direct and continued partnership with GHS

Embedded Scholarship Research Continuum
CUSHR Update: Faculty Fellow

Julia Sharp, PhD
Mathematical Sciences
Jeffrey Anker and four colleagues have been awarded a five-year, $1.57 million grant from the National Institutes of Health to develop a novel imaging technique and dye-based sensor to detect and monitor bacterial infections on implanted medical devices.

http://newsstand.clemson.edu/mediarelations/clemson-scientists-awarded-1-57-million-grant-to-study-infections-on-medical-implants/
Faculty and Core Leaders Associated with the NIH COBRE

- Founded in 2013
- 10 Faculty Members
- In April 2016 Awarded a $10.5 million Center of Biomedical Research Excellence (COBRE) grant from the NIH [PI: Lesly Temesvari; Co-PI: Kerry Smith]
- Total external funding to the center $18 million (NIH, NSF, American Heart Association, Knights Templar Eye Foundation)
Joseph Singapogu, PhD
K01 Award: Mentored Research Scientist Career Development Award

"CanSim: A novel simulator for training cannulation skills in dialysis care"

David Cull, MD
Vascular Surgery

Guigen Zhang, PhD
IBIOE/Bioengineering/ECE
Faculty Fellow, Sarah Griffin, PHS and collaborators from GHS including Kerry Sease, GHS Pediatrician won a 2016 Canyon Ranch Institute Health World Scholarship.
Roger Stevenson, MD was named Distinguished Alumnus by Wake Forest Medical Alumni Association Distinguished Achievement Award.
Lesly Temesvari, PhD
Associate Dean of Research
Alumni Distinguished Professor
Biological Sciences
College of Science
EPIC COBRE Principal Investigator
Vice Chairs of Academics
Develop & Enhance Research within their Departments

Mark Pruitt, MD
Vice Chair of Academics
Anesthesiology

Ronald Pirrello, MD
Vice Chair of Academics
Emergency Medicine

Irfan Asif, MD
Vice Chair of Academics
Family Medicine

J. Michael Feifer, MD
Vice Chair of Academics
Internal Medicine

Thomas Wheeler, MD
Vice Chair of Academics
Obstetrics & Gynecology

Kyle Jeray, MD
Vice Chair of Academics
Orthopaedics & Neurosurgery

Jenny Knight, MD
Vice Chair of Academics
Pathology

Desmond Kelly, MD
Vice Chair of Academics
Pediatrics

Ben Griffith, MD
Vice Chair of Academics
Psychiatry & Behavioral Medicine

Steve Lowe, MD
Vice Chair of Academics
Radiology

David Cull, MD
Vice Chair of Academics
Surgery
GHS-Clemson Collaboration Spotlight

Desmond Kelly, MD
Vice Chair for Academics
Department of Pediatrics
Greenville Health System
Clinical Faculty, CUSHR
Opportunities for Collaboration with the GHS Department of Pediatrics

CUSHR Fall Meeting October 28, 2016

Desmond Kelly, MD
Vice Chair for Academics and Community Services
Department of Pediatrics
GHS Children’s Hospital
Children’s Hospital
Clinical Services

• **400,000** infant, child and adolescent medical visits yearly
• **35,000** yearly visits to the Children’s Emergency Center,
• **185** clinicians
• **90** pediatric subspecialty staff physicians
• **40** subspecialties
## Pediatric Subspecialties

- Adolescent Pediatrics
- Pediatric Anesthesia***
- Ambulatory Pediatrics
- Behavioral Pediatrics
- Child-Abuse/Neglect
- Pediatric Cardiology
- Pediatric Critical Care
- Pediatric Dentistry*
- Developmental Pediatrics
- Pediatric Emergency Medicine***
- Pediatric Endocrinology
- Pediatric Gastroenterology
- General Pediatrics
- Pediatric Genetics***
- Pediatric Hematology
- Pediatric Infectious Disease
- Neonatology*

- Pediatric Neurology
- Pediatric Nephrology
- Pediatric Neurosurgery
- Newborn Pediatrics
- Pediatric Oncology
- Pediatric Ophthalmology
- Pediatric Otolaryngology (ENT)
- Pediatric Pathology***
- Pediatric Pharmacy
- Pediatric Plastic Surgery
- Pediatric Psychiatry
- Pediatric Pulmonary
- Pediatric Radiology
- Pediatric Rehabilitation
- Pediatric Sleep Medicine
- Pediatric Surgery
- Pediatric Trauma
- Pediatric Urology
The Intersection of Research and Clinical Services
Partnering with Clemson

- A mutually beneficial solution to the challenge of building an academic infrastructure
- Busy clinicians at GHS with great questions and ideas for research but limited time and research experience
- Established scientists at Clemson
- OSP; IAHC; Certificate Course in Clinical Research; Embedded Scholars; Interns
Research/Education
Focus Areas

• Drug exposed newborns
• Early Child Development
• Autism and related developmental disabilities
• Chronic illness and special health care needs
  • Eosinophilic Esophagitis; Diabetes; Asthma
• Obesity
• Child Population Health
• Interprofessional leadership training
Funded Projects and Clinical Trials

- MAIN (Managing Abstinence in Newborns)
- Eosinophilic Esophagitis
- Diabetes
- Autism
- Help Me Grow
- Medical Legal Partnership
- School Based Health Clinics
- Cystic Fibrosis
- Neurotherapeutics
Partnering to Transform Health Care

Jennifer Hudson, MD
Pediatrics

Rachel Mayo, PhD
Public Health

TRANSFORMING HEALTH CARE FOR NEWBORNS

Babies born with opioid dependence are inconsolable. They quit cold turkey at birth and start withdrawing within days. Jennifer Hudson, MD, sought a way to ease their agony. “I watched babies suffer,” says Hudson, director of newborn services at GHS. Symptoms of withdrawal hit hard several days after birth: muscle weakness, vomiting, seizures, tremors, fever, feeding problems, diarrhea, irritability, sleeplessness, breathing problems, apnea, rash, and more. It’s called Neonatal Abstinence Syndrome, or NAS. By the time full-blown symptoms of NAS developed, the health of these babies deteriorated rapidly with complications that often led to months in intensive care. “It was unethical,” she says. If doctors knew their mother was being treated with a long-acting opioid, such as methadone, during pregnancy, then why, she wondered, can’t treatment start at birth, before the agony of withdrawal begins? She went to a hospital pediatric pharmacist with an idea: a kinder, gentler approach to treating infants with NAS.

For the past eight years, under Hudson’s leadership, withdrawal treatment has started at birth for babies born at GHS, when mothers are known to have used long-acting opioids during late pregnancy. Rather than long stays in intensive care, these NAS babies typically go home after one week to bond with their families and continue to receive a slow medication wean at home. Outpatient physicians and visiting nurses monitor the four-week home treatment process. This makes for healthier babies, happier families, and lower costs, Hudson says.

Hudson’s data is currently under analysis by a team of researchers led by Rachel Mayo, PhD, and public health sciences professor at Clemson University, and including GHS’s Chief Science Officer Window Sherrill, PhD; Liewer Chen, a biostatistician and epidemiologist in Clemson’s Department of Public Health Sciences; Ian Dickson, an economist with Clemson’s Strom Thurmond Institute; and Brad Clifton, a medical doctor and postdoctoral fellow at Clemson. Their work is supported in part by a $1.3 million grant from the South Carolina Department of Health and Human Services.
Clemson Embedded Scholars

• Post-doc Fellow
  • Pediatric Gastroenterology
  • Pediatric Endocrinology

• Faculty Fellows
  – Dr. Joel Williams
  – Dr. Sarah Griffin
Embedded Scholarship

FACULTY FELLOWS
- Senior Faculty
- 3 days per week at GHS for one summer and academic term

Pediatric Faculty Fellow

PHS Faculty
Driving Simulator for Pre-Driving Skills in Autism – Dr. Johnell Brooks
Potential Research Opportunities

- Population Health
- Pulmonology
- Neurology
- Infectious Diseases
- Sleep Medicine
- Genetics (with Greenwood Genetics Center)
SmartState Endowed Chair in Childhood Neurotherapeutics

Professor of Biomedical Sciences

Departments of Pediatrics and Biomedical Sciences

University of South Carolina School of Medicine Greenville Campus

Manuel Casanova, MD
Announcements

- Save-the-date: Next CUSHR Meeting
  - Thursday, February 9, 2017 3-4:30 PM
- EPIC COBRE pilot projects
  - Internal submission
  - Due December 2, 2016
- Transformative Research Seed Grants 2016
  - Requires a GHS and CU partner
  - Due December 15, 2016