The University of Cincinnati College of Medicine—a Clinical and Translational Science Award (CTSA) institution—is ranked No. 40 among research medical schools by U.S. News & World Report. The college was founded in 1819 as the Medical College of Ohio and now is the second-oldest public medical school in the country.

Numerous research breakthroughs have been made here, including:

- The development of the world’s first oral, live-virus polio vaccine by Albert Sabin, MD.
- The creation of the first heart-lung machine in 1951 by Samuel Kaplan, MD.
- The first use of the YAG laser in 1984 for vaporizing previously inoperable brain tumors by John Tew, MD.
- Pioneering work by the Greater Cincinnati/Northern Kentucky Stroke Team at UC in tPA studies that established a protocol for quick stroke diagnosis and treatment. UC scientists also contributed to the development of NovoSeven®, a recombinant clotting factor for the treatment of brain hemorrhage caused by stroke.
- The first university-based environmental research facility to become nationally known for its studies of the health effects of lead in children, and was one of the first to test a chelation drug that effectively removed high lead levels from the bloodstream.

The college’s Office of Research has made a commitment to:

- Creating impactful and sustainable biomedical research programs.
- Developing passionate and innovative research teams.
- Becoming a destination for clinical trials.
- Harnessing “big data” to be not just evidence-based, but also evidence-gathering.

Three institutes—operated jointly with UC Health and focused on cancer, neurosciences and cardiovascular disease and with two centers, the Neurosciences Research Center and the Metabolic Disease Research Center—serve as the foundation for these commitments.
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Dean William S. Ball, MD, Melanie T. Cushion, PhD, and
Christopher J. Lindsell, PhD

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University of Cincinnati College of Medicine 50
On behalf of the University of Cincinnati College of Medicine, we are honored to present this first annual report on the research mission of the College. The data, publications and stories emphasize the achievements and successes of all of our research faculty in the 24 departments at the College. In this era of limited research funding, faculty have risen to the challenge by increasing our new grant holdings consistently through the last three years from $62 million in 2013 to $87 million in 2015. We have also increased the number of new grants from 141 to 171, at a success rate much higher than the national average at 26 percent, up from 22 percent. We are on track to continue this growth in 2016. We recognize what a remarkable accomplishment this has been, and we commend our scientific community on the significant effort this represents.

The growth in research brought about by our scientists translates directly to more basic discoveries being made at the bench and being transitioned into innovations in clinical care; testimony to the academic difference that we as a College provide to the Community.

To have impactful and sustainable biomedical research programs, investment must be made in our faculty, infrastructure and research programs. In the College Office of Research alone, we have increased the College’s investment to $1 million per year to fund pilot projects, recognition awards, bridge funding, grant pre-review opportunities and other innovative programs and workshops that further our research mission. Investment is also taking place to improve our processes and facilities as we strive to create an environment that fosters scholarship, ingenuity and collaborative science.

The success of our research community would not be possible without our staff, who help us in putting together and submitting our proposals and maintaining the administration of our funding relationships. Their support is demonstrated by the long hours they put in alongside us during proposal submissions and grant deadlines, and we thank them for their incredible dedication.

In this report, you will discover the vast array of research ongoing in the College, and the investigators that each department chose to be recognized for their research achievements. Our publications highlight the basic discoveries, translational science, clinical trials and outcomes research that are hallmarks of a great college of medicine.

William S. Ball, MD  
Senior Vice President for Health Affairs and Dean  
*College of Medicine*

Melanie T. Cushion, PhD  
Senior Associate Dean for Research  
*College of Medicine*

Christopher J. Lindsell, PhD  
Associate Dean for Clinical Research  
*College of Medicine*
TOTAL RESEARCH HOLDINGS
University of Cincinnati **College of Medicine**

\[
\{ \$177,305,165 \}
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<thead>
<tr>
<th>Department</th>
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For Department of Pediatrics data, please refer to the Cincinnati Children’s Hospital Medical Center annual report available at: cincinnatichildrens.org/research/cincinnati/annual-report/2015/default
### NEW AWARDS FY2015

<table>
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**Research Faculty:** 492

**Faculty with Sponsored Research:** 316

**Faculty Who Were Principal Investigators on One or More Sponsored Awards:** 214
INDUSTRY SPONSORED CLINICAL TRIALS

Total Revenues

$12,183,498
HIGHLIGHTED RESEARCHERS

FY2015
The fungal pathogens in the genus Pneumocystis, which cause pneumonia in patients with compromised immune status.

Fungi in the genus *Pneumocystis* cause an oftentimes lethal pneumonia in humans and other mammals with compromised immune status. The niche of these fungi include patients with underlying chronic diseases such as COPD or HIV and those receiving anti-inflammatory or immunosuppressive agents. PCP is not responsive to standard antifungal therapy with few treatment alternatives besides trimethoprim-sulfamethoxazole. My laboratory focuses on the pre-clinical drug development to identify new anti-Pneumocystis agents using a pipeline that starts with understanding the metabolism of these obligate fungi through *in vitro* assessment, evaluation of toxicity, and eventually to testing in animal models of this fungal pneumonia.

**FY2015 research highlights**

My colleagues, Drs. Alexey Porollo and Mike Linke, and my lab, discovered that Pneumocystis were myo-inositol auxotrophs, meaning that these fungi cannot synthesize myo-inositol, an essential nutrient necessary for viability. We then identified the inositol transporters that were capable of sequestering myo-inositol from the mammalian host. Since myo-inositol is essential for life and the only means they have to obtain it is to transport it, inhibiting these transporters would result in death of these fungi and cure of the pneumonia. Thus, we now have a new drug target which we are developing for treatment of Pneumocystis pneumonia. The identification and development of this target exemplifies the discovery to translational to bedside pathway that research in the College of Medicine has as its mission.

**Most significant FY2015 publication**


**What is the potential impact of this work?**

Inhibition of myo-inositol transport could lead to a new line of therapeutic or prophylactic drugs to treat Pneumocystis pneumonia. Since humans and other mammals can satisfy their requirement for myo-inositol by either synthesizing or transporting it, there should be little to no toxicity resulting from such a treatment.

**What does 2016 hold for your research?**

We are working with Dr. Eddie Merino in UC’s Department of Chemistry to synthesize a dye-tagged myo-inositol reporter as a critical component of a high throughput screening system (HTS) to identify candidate drugs/inhibitors. Once identified, the selected candidates will be analyzed for pharmacodynamics/pharmacokinetics in collaboration with Dr. Pankaj Desai, College of Pharmacy, and tested in an animal model of Pneumocystis pneumonia.
As well as designing and analyzing clinical trials, I develop statistical models to better understand health and healthcare. Through various regression techniques and with the application of machine learning, we are able to identify factors that contribute to disease heterogeneity, identifying both mechanistic pathways and treatment targets. Similarly, statistical models that explore health services allow optimization of our healthcare systems.

FY2015 research highlights
In FY 2015, in collaboration with Dr. Hector Wong at Cincinnati Children’s Hospital, we developed several statistical models that begin to create a personalized medicine approach to septic shock. We found that we can map genes reflective of steroid response, and that it is possible to accurately differentiate between patients at very low risk of mortality who do not need invasive treatments, and those at high risk.

Most significant FY2015 publication

What is the potential impact of this work?
If we can identify which patients respond to which therapies very early in the course of septic shock, we will be able to target treatments effectively in this often catastrophic condition. Incorporating our biomarker and gene based models into decision making could prevent patients who do not benefit from invasive therapies from being put at risk, while maximizing exposure of responders to those treatments.

What does 2016 hold for your research?
We are expanding our understanding of septic shock heterogeneity into the adult population, and using this information to design clinical trials that incorporate both prognostic and predictive enrichment strategies. These strategies help to identify those patients most in need of treatment, and those most likely to benefit from a treatment, greatly enhancing the likelihood of success of the trial.
Injury to the liver, as may occur during surgical resection, transplantation or hypovolemic shock, involves a complex cascade of molecular events that may be targeted therapeutically. The liver also has the unique capacity to regenerate after injury, and understanding the cellular and molecular pathways regulating this response may allow us to develop new therapies for patients undergoing complex liver surgeries or with underlying liver disease.

**FY2015 research highlights**

We discovered that hepatocytes release small vesicles, called exosomes, during the injury response and that these exosomes promote cell proliferation and regenerative response in the liver.

**Most significant FY2015 publication**


What is the potential impact of this work?

The work identifies exosomes released by hepatocytes as a new, endogenous mechanism contributing to liver regeneration after injury. We also documented the molecular mechanism by which these exosomes induce cell proliferation. This work not only extends our fundamental knowledge of liver regeneration, but provides opportunities for the design of novel therapeutics.

What does 2016 hold for your research?

We are currently exploring how hepatocyte exosome release is modulated during the injury response as well as their therapeutic potential in chronic liver disease.
FY2015 research highlights

Our recent results demonstrated that surgical injury during the neonatal period evokes long-term changes in excitatory and inhibitory synaptic signaling onto adult lamina I projection neurons which leads to enhanced action potential discharge in response to sensory input. Since these neurons represent the major output of the spinal nociceptive network and are essential for the generation of inflammatory and neuropathic hyperalgesia, we propose that this altered synaptic integration may significantly shift the input–output relationship of the circuit and thereby favor the amplification of ascending pain signals in the CNS.

Most significant FY2015 publication


What is the potential impact of this work?

Following neonatal injury, the above shift in the transformation of sensory inputs into action potential discharge by ascending spinal projection neurons is predicted to enhance the gain of nociceptive transmission to the brain, and thus represents a novel potential mechanism by which mature pain pathways may be “primed” by early tissue damage.

What does 2016 hold for your research?

We are currently pursuing two main goals. First, we are in the process of identifying the effects of early tissue damage on activity-dependent plasticity at sensory synapses onto adult projection neurons. Our data thus far suggest that neonatal injury creates a more permissive environment for the induction of synaptic long-term potentiation (LTP) in the adult spinal cord, which has been proposed as a key mechanism by which nociceptive signals can be amplified in the CNS. Second, we are using innovative molecular approaches, including translating ribosome affinity purification (TRAP) techniques, to selectively characterize the comprehensive genetic profile of spinal projections neurons for the first time. A better understanding of the complete pattern of gene expression in this neuronal population could yield new therapeutic strategies to dampen ascending nociceptive signaling, and thus pain perception, after nerve and tissue injury.
UC’s Department of Biomedical Informatics is the new academic home for informatics at the College of Medicine. The Department provides a foundation for faculty, staff and trainees to develop new methods and technologies that use biomedical data to improve health outcomes, and to foster data-driven collaborations and knowledge sharing amongst the UC, Cincinnati Children’s and UC Health research communities.

Peter White, PhD, serves as the Rieveschl Chair of the Department at the College of Medicine, and also as Director of the Division of Biomedical Informatics at Cincinnati Children’s. This dual role is designed to bring both institutions closer together through sharing of health data, innovative technologies and new computational approaches. In his role, Dr. White oversees informatics research and resources at both institutions, including academic, research, and collaborative service missions. He also serves as co-director of Cincinnati Children’s Center for Pediatric Genomics.

“We create and provide innovative computational approaches to enable the practice of precision medicine for investigators and clinicians in Cincinnati and around the world,” says White. “Our goal is to drive the next generation of understanding and discovery of disease causes and cures through data sciences and to broadly empower multiple communities to improve human health. The collaborative nature of the UC Academic Health Center uniquely positions us to tackle some of the biggest and most complex health challenges facing our community, and our nation.”

Dr. White is also overseeing the launch of new graduate programs and institution-wide events designed to build a collaborative informatics community. “We want to train and educate the next generation of biomedical informatics researchers and to extend data literacy, utility and actionability throughout our academic and clinical communities,” he says.

In his research career, Dr. White has explored the development and application of novel approaches for disease gene discovery. He has developed innovative approaches for integrating and disseminating clinical, phenotypic, and molecular data to researchers for promoting discovery and hypothesis validation. Dr. White is currently playing a lead informatics role on a number of national data projects.

Dr. White came to Cincinnati Children’s from the Children’s Hospital of Philadelphia, where he launched the Research Institute’s Center for Biomedical Informatics in 2006 and oversaw that center’s expansion in genome analysis. He has an undergraduate degree in biology and received a PhD in Molecular Genetics at Washington University in St. Louis in 1992.
CANCER BIOLOGY

Maria F. Czyzyk-Krzeska, MD, PhD
Professor

PRIMARY RESEARCH FOCUS

The studies of autophagy in renal cancer.

Our laboratory focuses on the studies of autophagy in renal cancer. Autophagy is a process of self-eating. Under normal circumstances, autophagy serves as a mechanism of quality control, maintaining healthy organelles and properly processed proteins, and as a source of nutrients during starvation. The role of autophagy in cancer is complex and varies depending on autophagic pathways. Autophagy has tumor suppressing activity protecting epithelial cells from oncogenic transformation, yet cancer cells of fast growing tumors are addicted to autophagy for nutrients.

FY2015 research highlights

Metastatic clear cell renal cell carcinoma (ccRCC) is largely an incurable disease and the existing treatments are only partially effective. We discovered a network regulating oncogenic autophagy in ccRCC that can be subject to experimental therapeutics. This pathway, downstream from the VHL and miR-204 tumor suppressors, involves activity of the TRPM3 channel which promotes autophagic programs through Ca2+ and Zn2+ influx. We showed that a small molecule inhibitor of TRPM3, MFA, inhibits autophagy and tumor growth. This is an important proof-of-concept that TRPM3 represents an actionable target for treatment of ccRCC.

Most significant FY2015 publication


What is the potential impact of this work?

Our work provides strong rationale for further search for selective inhibitors of TRPM3 TRP cationic channels that are emerging as molecular targets in the development of therapeutic compounds, including several being tested in clinical trials for treatment of pain. It is our hope that TRPM3 inhibitors can be used in treatment of ccRCC.

What does 2016 hold for your research?

We are focusing on additional oncogenic functions of TRPM3 channel. TRPM3 negatively regulates a specific tumor suppressing autophagic pathway. It also has effects on cellular metabolism, which are independent of autophagy.

‡ Publications were self-reported and include publications outside of research faculty.
Zalfa Abdel-Malek, PhD
Professor

DEPARTMENT RESEARCH DETAILS
Research faculty — 3
New awards — 2
Total research holdings — $1,268,640
Departmental publications — 38‡
Research fellows — 0

PRIMARY RESEARCH FOCUS
Genetic susceptibility to sun-induced cutaneous melanoma.

FY2015 research highlights
Filed two patent applications on small peptide analogs of melanocytes stimulating hormone that are being developed as topical agents that induce sunless tanning and protect from the DNA damaging effects of solar ultraviolet radiation (including melanoma). Established the role of keratinocyte-derived endothelin-1 and its receptor, the endothelin-B receptor in reducing DNA damage caused by exposure to ultraviolet radiation in human melanocytes.

Most significant FY2015 publication

What is the potential impact of this work?
This demonstrates a novel mechanism based on endothelin-1 and endothelin B receptor axis for protection of human melanocytes from the photodamaging and photocarcinogenic effects of solar ultraviolet radiation. This pathway can potentially be harnessed for developing novel melanoma chemoprevention strategies.

What does 2016 hold for your research?
Steady progress in preclinical testing of the melanocortin analogs. Identifying novel targets based on the endothelin-1 signaling pathway for prevention of sun-induced melanoma. Progress in collaborative projects aimed at understanding the mechanism(s) for resistance of melanoma tumor cells to Braf inhibitors, and the significance of the tumor microenvironment in melanoma progression.

‡ Publications were self-reported and include publications outside of research faculty.
EMERGENCY MEDICINE

Gregory J. Fermann, MD
Professor
Executive Vice Chairman
Director, Emergency Medicine Clinical Trials Center

DEPARTMENT RESEARCH DETAILS
Research faculty — 16
New awards — 8
Total research holdings — $4,333,289
Departmental publications — 81
Research fellows — 1

PRIMARY RESEARCH FOCUS
Risk stratification and treatment of cardiovascular diseases, specifically acute coronary syndrome, acute heart failure and venous thromboembolic disease.

FY2015 research highlights
Decision making in the emergency department is complicated by the environment, the shortened timelines, and a general aversion to risk. As such, many patients get admitted who may not need it. After nearly 10 years of design, data collection and comprehensive statistical modeling, we successfully developed and published a risk stratification tool for patients with acute heart failure (AHF). The STRATIFY study was an NIH-funded, multi-center, prospective observational cohort study that enrolled 2,074 patients presenting to the ED with signs and symptoms of AHF. We were able to develop a decision tool that significantly outperforms medical decision making. The tool identifies patients at low risk of poor outcomes and can be used to avoid hospitalization in up to 15 percent of patients being admitted with AHF. Similar to this, we were also able to develop a decision tool for patients with acute pulmonary embolism using the simplified pulmonary embolism severity index (sPESI). Getting these tools into the hands of clinicians is highly rewarding as they have significant potential to save time and resources as well as improve our patients’ lives.

Most significant FY2015 publications

What is the potential impact of this work?
Over 80 percent of patients who present to US emergency departments with acute heart failure and acute pulmonary embolism are admitted to the hospital, yet many do not need to be there. This increases costs for the patient and for the system. Our work fills a critical unmet need by improving decision making with objective tools.

What does 2016 hold for your research?
Our team is now investigating novel therapies for treating acute heart failure, and new drugs that help manage bleeding in those patients that are on the newer blood thinners. As well, we will continue to develop tools and evaluate biomarkers to enhance decision making in acute heart failure, acute coronary syndromes, and venous thromboembolic disease.

‡ Publications were self-reported and include publications outside of research faculty.
PRIMARY RESEARCH FOCUS

The long-term objective of my research is to characterize how specific gene-environment interactions during embryogenesis cause congenital cardiac malformations.

Specifically, the central question that we ask is whether interplay during early development between endogenous and toxic/adaptive functions of the aryl hydrocarbon receptor (AHR) and its most potent ligand, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)—a model for many environmental agents—perturbs the concerted differentiation patterns of cardiac cell lineages and leads to congenital cardiac malformations at birth and to adult heart disease later in life.

FY2015 research highlights

My lab has found that disruption of AHR expression levels, or AHR activation by TCDD, results in gene expression changes that perturb cardiomyocyte differentiation in embryonic stem cells and cardiogenesis in mice suggesting that during development the AHR coordinates a complex regulatory target network responsible for attainment and maintenance of cardiac homeostasis.

Most significant FY2015 publication


What is the potential impact of this work?

The health significance of this work is that in humans and mice, polymorphisms that result in haploinsufficiency in several transcription factor genes affected by TCDD cause congenital cardiac malformations that are also epidemiologically associated with maternal exposure to dioxins and polychlorinated biphenyls during pregnancy and cause human congenital malformations and adult cardiovascular disease. Results from this research will be highly significant to the understanding and prevention of environmental cardiac injury.

What does 2016 hold for your research?

In collaboration with the Rubinstein Lab (Cardiovascular Division, Internal Medicine) we will study whether dioxin exposure in utero causes persistent changes in the heart-specific epigenetic program and induces haploinsufficiency in critical developmental genes that may be responsible for the decreased cardiac function and subsequent development of cardiomyopathy observed in mice and in epidemiological studies in humans. We will use a comprehensive set of functional, genetic and epigenetic mechanistic analyses that will help us identify the mechanisms by which an environmental agent induces harmful changes in the developmental program and characterize the role of fetal environmental exposures in adult disease.

‡ Publications were self-reported and include publications outside of research faculty.
FAMILY AND COMMUNITY MEDICINE

Matthew Tubb, MD, PhD
Assistant Professor

DEPARTMENT RESEARCH DETAILS
Research faculty — 15
New awards — 6
Total research holdings — $3,101,859
Departmental publications — 52
Research fellows — 0

PRIMARY RESEARCH FOCUS
Health promotion, disease promotion and management, and the common conditions that affect great numbers of our patients, such as diabetes, high cholesterol and heart disease.

FY2015 research highlights
We received an AHRQ-funded R21 study to develop a novel iPad app for use by smokers in their PCP’s office, “eQuit WorRx: A Mobile App to Enhance Smoking Cessation Shared Decision Making in Primary Care.” The interprofessional team is developing an iPad app for patients to use in their primary care office while they wait for their doctor. The app collects information from them including health information, their level of dependence, motivations to smoke and to quit, and quit methods, and shares back customized feedback and motivation. This mHealth decision aid app for smoking cessation in primary care, specifically targeting shared decision making while minimizing clinician time commitment.

What is the potential impact of this work?
Smoking is the leading preventable cause of morbidity and mortality in the United States. Primary care physicians (PCPs) have a unique opportunity to discuss smoking cessation evidence in a way that improves the chance that a patient has for quitting. With so many options for cessation support, it is important for clinicians to personalize evidence-based interventions that are both useful and appealing to patients.

What does 2016 hold for your research?
We submitted a proposal to NIDDK to develop a novel communication and self-management intervention called “portal self management engagement” or “portal-SME” for use among patients with poorly controlled Type 2 diabetes mellitus in typical primary care practices. We will pilot our eQuit WorRx app in the UC Health Primary Care Network. Primary patient-centered outcomes will include shared decision-making, decisional conflict and quality of patient-physician communication. Secondary outcomes will include app usability and acceptability and smoking-relevant outcomes, smoking cessation method, stage of change and smoking cessation rates after 12 weeks.

‡ Publications were self-reported and include publications outside of research faculty.
**INTERNAL MEDICINE**

**Kenneth Sherman, MD, PhD**  
Robert and Helen Gould Endowed Professorship in Internal Medicine  
Director, Division of Digestive Diseases

**DEPARTMENT RESEARCH DETAILS**  
Research faculty — **114**  
New awards — **57**  
Total research holdings — **$33,307,546**  
Departmental publications — **381**†  
Research fellows — **31**

**PRIMARY RESEARCH FOCUS**

Molecular epidemiology, diagnosis and treatment of viral hepatitis, with a focus on HIV-infected populations

**FY2015 research highlights**

- We published the culmination of a seven-year study that examined the mechanisms that modulate hepatitis C replication in HIV-infected persons being started on antiretroviral therapy.

**Most significant FY2015 publication**


**What is the potential impact of this work?**

- The work was highlighted by news services around the world and influenced national and international treatment guidelines in millions of patients with HCV/HIV coinfection.

**What does 2016 hold for your research?**

- We are focused on exploring the role of a class of antiretroviral agents, namely CCR5 inhibitors to modulate hepatitis C infection and hepatic fibrosis (scarring). We are also studying the role of hepatitis E to cause injury in those with HIV and those who undergo solid organ transplantation.

† Publications were self-reported and include publications outside of research faculty.
MEDICAL EDUCATION

Andrew Thompson, PhD
Assistant Professor

DEPARTMENT RESEARCH DETAILS
Research faculty — 1
New awards — 1
Total research holdings — $21,951
Departmental publications — 9
Research fellows — 0

PRIMARY RESEARCH FOCUS
Factors that affect student examination performance. In particular, how different types of assessments and changes in curricular structure impact examination scores.

FY2015 research highlights
Most of my research effort has gone toward evaluating factors that influence student performance on gross anatomy practical examinations, with an end goal of identifying ways to improve this assessment environment and align it with the broader goals of a curriculum.

Most significant FY2015 publication

What is the potential impact of this work?
The goal of this paper was to develop a guide that allows researchers and educators in the anatomical sciences to more accurately and consistently utilize Bloom's taxonomy in both research and pedagogical contexts. I subsequently used the rubric developed in this paper to retrospectively look at the relationship between cognitive levels of assessment and student outcomes on gross anatomy practical examinations. This research was presented at the 2015 American Association of Anatomists annual meeting and an article based on this study is currently under review for publication. The broader goals of these interrelated studies are to provide a way to objectively blueprint examinations and to better appreciate how the structure of an examination can impact student performance. Understanding these factors will ultimately allow educators to construct examinations in a more deliberate manner that reflects curricular and institutional learning objectives.

What does 2016 hold for your research?
In the future I plan to explore these topics more broadly through collaborations with colleagues at other institutions in hopes to identify trends that have a broader application in the medical education community.

‡Publications were self-reported and include publications outside of research faculty.
Molecular and Cellular Physiology

Bryan Mackenzie, PhD
Associate Professor

Primary Research Focus

The molecular physiology of cellular iron transport.

My research focuses on the molecular physiology of cellular iron transport. Iron transport across the cell membranes of intestinal cells and of macrophages recycling iron from senescent red blood cells is an important control point in iron homoeostasis. This field is of major public health significance because of the prevalence of iron-deficiency anemia and of hereditary disorders that result in iron-overload syndrome. Our work centers on divalent metal-ion transporter-1 (DMT1), a widespread iron transporter responsible for iron uptake into intestinal cells and developing red blood cells, and ferroportin, the only known cellular iron-export protein. We explore the molecular mechanisms and structure–function of DMT1 and ferroportin by expressing these transporters in RNA-injected Xenopus laevis oocytes (frog eggs), and explore their functional roles in genetically modified mouse models.

FY2015 research highlights

We were awarded a five-year $3 million research grant “Ferroportin Structure and Function” from the National Institutes of Medicine (NIDDK R01-DK 107309). The goals of this multi-center study are to solve the structure of mammalian ferroportin by using X-ray crystallography, determine the mechanisms of ferroportin-mediated iron transport and discover the structural determinants of ferroportin function and malfunction. The project brings together the complementary expertise of three laboratories: crystallography—Mika Jormakka, PhD (University of Sydney, Australia); molecular physiology and functional studies—Bryan Mackenzie, PhD (UC); and translational research in iron disorders—Elizabeta Nemeth, PhD (UCLA).

Most significant FY2015 publication


What is the potential impact of this work?

This work will help drive new therapies to improve iron nutrition—iron deficiency remains the most prevalent micronutrient deficiency worldwide. Our study using the intestinal DMT1 knockout model establishes DMT1 as a validated therapeutic target to block iron absorption and prevent toxic iron overload in hereditary iron-overload disorders.

What does 2016 hold for your research?

We continue to study the molecular physiology and cellular roles of DMT1 and ferroportin. A major focus of our work in 2016 will be to explore novel potential therapeutic targets as well as DMT1 and ferroportin for the prevention of iron overload in hereditary hemochromatosis and thalassemia patients.

‡ Publications were self-reported and include publications outside of research faculty.
MOLECULAR GENETICS, BIOCHEMISTRY AND MICROBIOLOGY

Thomas Thompson, PhD
Associate Professor

DEPARTMENT RESEARCH DETAILS
Research faculty — 19
New awards — 8
Total research holdings — $4,775,880
Departmental publications — 54
Research fellows — 7

PRIMARY RESEARCH FOCUS

The structure-function relationship of the Transforming Growth Factor (TGF family of signaling ligands, including the bone morphogenetic proteins [BMP]), myostatin and activin.

Our laboratory investigates the structure-function relationship of the Transforming Growth Factor (TGF family of signaling ligands, including the bone morphogenetic proteins [BMP]), myostatin and activin. Ligands orchestrate cellular cues and are critical determinants of cell fate where their misregulation leads to numerous pathologies, including cancer and fibrosis. Ligands are tightly regulated by a number of mechanisms. One such mechanism is where ligands are antagonized or neutralized by extracellular protein antagonists. The focus of our laboratory is to reveal how the structural diversity of extracellular antagonists differentially regulates ligands within the TGF family.

FY2015 research highlights

Toward this goal, in 2015 the laboratory was awarded an R01 to investigate how members of the DAN family antagonize BMP ligands. Extracellular antagonists of the DAN family are upregulated in chronic kidney disease and pulmonary fibrosis, along with reactivation of breast cancer stem cells and the goal of this work is to understand the general mechanism of inhibition and how this compares to other BMP antagonists.

Most significant FY2015 publication


What is the potential impact of this work?
Knowledge of these interactions can facilitate the rational design of inhibitors that can be used to rebalance BMP signaling in a variety of disease states.

What does 2016 hold for your research?

While the structure of a DAN family member in complex with a BMP ligand has remained elusive, the laboratory expects that substantial progress in the coming year will provide new and exciting results on BMP and TGF regulation.

‡ Publications were self-reported and include publications outside of research faculty.
Michael Privitera, MD
Professor
Director, Epilepsy Center,
UC Neuroscience Institute

DEPARTMENT RESEARCH DETAILS
Research faculty — 28
New awards — 8
Total research holdings — $22,824,664
Departmental publications — 152
Research fellows — 1

PRIMARY RESEARCH FOCUS

Epilepsy treatments.

I have worked on new antiepileptic trials, both new meds and comparative trials for 30 years.

FY2015 research highlights

We completed a multicenter randomized controlled trial of stress reduction as adjunctive treatment for medication refractory epilepsy, funded by a local donor plus the Epilepsy Foundation. We also completed two major multicenter, randomized controlled trials of generic equivalence of antiepileptic drugs funded by FDA and other foundations. We also initiated a trial of cannabidiol for medication refractory epilepsy; funded by GW Pharmaceuticals, this is the first randomized control trial of any marijuana derivative for epilepsy.

Most significant FY2015 publication


What is the potential impact of this work?

The generic study was the most comprehensive study of generic equivalence ever performed in any therapeutic area. There was great apprehension in the public and among clinicians about safety of generics in people with epilepsy. Our study and another to be published later this year, put to rest these concerns, potentially saving the health care system billions of dollars per year. The stress study opens a new area of clinical and translational work in addressing the No. 1 seizure trigger reported by people with epilepsy.

What does 2016 hold for your research?

We are doing further analysis on specifics of the stress-seizure study because we collected thousands of days of stress diary responses on these patients which may allow us to determine specific patterns of stress triggered seizures. Ideally this could lead to patients being able to identify high-risk days for seizures based on their own seizure triggers of stress and mood variables.

‡ Publications were self-reported and include publications outside of research faculty.
PRIMARY RESEARCH FOCUS
To translate neurobiological mechanisms of acute brain injury into improved diagnosis and treatment of brain injury in the clinic.

Basic research has shown that brain infarction develops as a consequence of pathologic mass depolarizations of cerebral gray matter, known as spreading depolarization/depression. In the lab, we study different aspects of spreading depolarizations in various animal models of brain injury and trauma. In clinical studies, we investigate the impact of spreading depolarizations on patients and better ways to monitor and treat them.

FY2015 research highlights
A highlight of our research was the publication of a study showing that spreading depression/depolarization could be detected in patients using scalp EEG (electroencephalography) recordings. Since the discovery of spreading depression in animals in 1944, spreading depressions had never been observed in the human brain using non-invasive techniques. This study is an important step toward integrating the diagnosis of spreading depression into routine practice of neurocritical care.

Most significant FY2015 publication

What is the potential impact of this work?
Our research and development aims to provide novel minimally invasive and noninvasive diagnostic procedures that can be used to diagnose and manage acute and subacute mechanisms of TBI secondary injury in military, veteran and civilian populations.

What does 2016 hold for your research?
In 2016, we will launch two new multi-center clinical studies. The first aims to determine whether therapeutic hypothermia is an effective treatment to inhibit spreading depolarizations and improve outcomes in patients with acute subdural hematoma (a type of traumatic brain injury). The second study aims to improve and automate minimally invasive and non-invasive methods to monitor spreading depolarizations in patients.

‡ Publications were self-reported and include publications outside of research faculty.
Michael Thomas, MD
Professor
Vice Chair of Research
Division of Reproductive Endocrinology and Infertility and Fellowship Director

Primary Research Focus
Contraceptive development.

FY2015 research highlights
I’ve been the Principal Investigator of the Contraceptive Clinical Trials Network since 1995. This contract with the National Institutes of Health has been renewed twice, the last time in 2013.

Most significant FY2015 publication

What is the potential impact of this work?
This work investigated the impact of two different doses of a one-year combination contraceptive vaginal ring on the effect of hepatic proteins and factors that affect coagulation.

What does 2016 hold for your research?
We will be working with the NIH to develop and test two new copper IUDs and a contraceptive transdermal system. We continue to work with Shuk Mei Ho, PhD and colleagues in the Department of Environmental Health to investigate the effect of environmental toxins on sperm and oocyte development.

‡ Publications were self-reported and include publications outside of research faculty.
OPHTHALMOLOGY

Winston W-Y Kao, PhD
Ben and Louise Tate Professorship of Ophthalmology

DEPARTMENT RESEARCH DETAILS
Research faculty — 5
New awards — 4
Total research holdings — $2,536,683
Departmental publications — 54
Research fellows — 3

PRIMARY RESEARCH FOCUS
Gene and cell therapy of congenital corneal diseases caused by genetic mutation and traumatic corneal injury. Investigation of morphogenesis and homeostasis of ocular surface by perturbed gene functions via transgenesis and gene ablation.

FY2015 research highlights
In the past several years, our laboratories have established several experimental mouse lines in which the genetic functions were perturbed in ocular surface tissues, e.g., cornea, conjunctiva and eyelids during development and in adults. Some of the mouse lines are used as experimental models for cell and gene therapy. We have transplanted umbilical mesenchymal stem cells (UMSC) in curing cloudy corneas caused by genetic mutations, e.g., Lumican knockout mice, Gusb mice (manifested symptom of lysosomal storage diseases) caused by a spontaneous mutation of β-glucuronidase. Furthermore, transplantation of UMSC also leads to restoring corneal transparency after alkali burn by modulating via recipient's inflammation and immune responses the synthesis of glycocalyx by UMSC. We have identified transcription factors, e.g., Klf4, and Wnt signaling cascades have a pivotal role in corneal epithelium morphogenesis during development and maintenance of homeostasis in adults. We have initiated a new research of using Genome Editing in attempt of curing lysosomal storage diseases. Preliminary data are very encouraging.

Most significant FY2015 publication

What is the potential impact of this work?
UMSC transplantation can potentially cure congenital corneal disease and traumatic corneal injuries. The studies have established the groundwork for creating experimental mouse models that can be used to elucidate gene functions during development of ocular surface and gene and cell therapy of ocular surface diseases, e.g., corneal dystrophy, dry eye disease, etc.

What does 2016 hold for your research?
In 2016, we will characterize three new transgenic mouse lines created with novel CRISPR genome editing technique. We have obtained Krt4-rtTA and Abcb5-rtTA knock-in mice for specific gene modification in conjunctiva and corneal epithelium stem cells, respectively. We have also obtained and modified the notch signaling pathway as well as the transcription factor, PPAR-gamma to determine the molecular mechanism responsible for the formation and function of the meibomian gland.

‡ Publications were self-reported and include publications outside of research faculty.
ORTHOPAEDIC SURGERY

Jon Divine, MD
Professor
Head Team Physician, University of Cincinnati
Current President, American Medical Society for Sports Medicine

DEPARTMENT RESEARCH DETAILS
Research faculty — 1
New awards — 0
Total research holdings — $5,757
Departmental publications — 130*
Research fellows — 2

PRIMARY RESEARCH FOCUS

Treatment and rehabilitation of concussion in athletes and non-athletes.

My individual research mission is to continue to manage and facilitate our great (and growing) team to develop and test hypothesis-driven exercise and sports science, projects which help to improve the health and performance of athletes. Our mantra is to keep in mind that everyone is an athlete – some just don't know it yet!

FY2015 research highlights

As the new AMSSM President, being able to present the annual Harry Galanty Award for excellence in sports medicine research at the 2015 AMSSM National meeting to UC Orthopaedics & Sports Medicine faculty member Mike Donaworth, MD, for work our group did titled: “The Use of Vision Training as a Means of Decreasing Concussion Incidence in Football.”

Most significant FY2015 publication


What is the potential impact of this work?

This has been a significant springboard publication for our group as it has led to additional research projects and clinical initiatives. It is also one of the first papers to actually show an intervention which can prevent concussions in football. Our group has discovered the value of including vision training as both a means of primary prevention and treatment for mTBIs and sports concussions. We now include vision training in our rehabilitation program which focuses upon individualized rehab prescription based upon the injured individualized over-riding post-concussion symptoms.

What does 2016 hold for your research?

Our group is expanding to include collaborations within the College of Medicine and UC’s main campus. Our focus will continue to identify novel means for the diagnosis and treatment of mTBI/sports concussions. However, not to be labeled as a “one trip pony,” we have expanded our work to the broad area of identifying potential training risk factors for injury and illness. We’re in our third year of looking at problems related to heat illness in our athletes in training: specifically those with a history of rhabdomyolysis or sickle cell trait. Our American Athletic Conference champion UC Women’s soccer team has provided us with a wealth of data this past season yet to be fully analyzed including GPS-obtained data on training volume, blood biomarkers for overtraining and digital recordings to develop a simple biomechanical test to evaluate risk of lower extremity injury.

* Publications were self-reported and include publications outside of research faculty.
PRIMARY RESEARCH FOCUS

The mechanisms of vocal fold vibration and voice production.

Voice is produced by vocal fold vibration. However, how the vibration is converted to sound is not completely understood. Our lab investigates the mechanisms of vocal fold vibration and voice production. Also, we are using our findings to determine optimal surgical treatments for unilateral vocal cord paralysis.

FY2015 research highlights
Clinical research has failed to show what are the best operations for vocal cord paralysis. We found a new mechanism that determines vocal fatigue and reduced intelligibility in noise, which are common complaints of many of our patients. We have found that certain surgical treatments improve intelligibility and vocal fatigue more than other operations; the symptoms have not been previously measured in the literature.

Most significant FY2015 publication

What is the potential impact of this work?
Flow rate at the vocal fold exit determines voice quality. Previously, no one has been able to measure flow rate at the vocal fold exit in a human or animal model. This paper, “Direct Measurement of Planar Flow Rate in an Excised Canine Larynx Model,” represents the first successful methodology.

What does 2016 hold for your research?
Our NIH R01 grant is refunded up to 2020. We will continue to study how different diseases and surgical procedures affect voice quality, vocal fatigue, loudness and intelligibility in noise (like a noisy restaurant).

‡ Publications were self-reported and include publications outside of research faculty.
**PRIMARY RESEARCH FOCUS**

To determine the molecular basis underlying the apparent protective effect of high density lipoproteins against inflammation and atherosclerosis.

**FY2015 research highlights**

Our lab has been cataloging the HDL proteome in humans and showing that it is much more diverse than previously thought. We also recently showed that the mouse HDL proteome is just as diverse as the human.

**Most significant FY2015 publication**


**What is the potential impact of this work?**

Our work showed that the mouse model of HDL can be used as a reasonable surrogate for human effects. Up to now, uncertainty about the mouse model has precluded the widespread use of this important tool to study HDL metabolism.

**What does 2016 hold for your research?**

We have developed new techniques to rapidly quantify proteins in human lipoproteins. We anticipate using this technology to identify new biomarkers that track with cardiovascular disease and other inflammatory disorders.

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§ Publications were self-reported and include publications outside of research faculty.
DEPARTMENT RESEARCH DETAILS*
Faculty — 944
New awards — not available
Total research holdings — $198,051,881†
Departmental publications — 2,096‡
Research fellows — 162

PRIMARY RESEARCH FOCUS

Investigating pathways that regulate epithelial and immune cell homeostasis in the context of intestinal health and disease.

My lab provides insight into molecular mechanisms underlying the host-microbe relationship and examines how this level of regulation affects the development of chronic diseases, such as inflammatory bowel disease.

FY2015 research highlights

I identified a histone deacetylase that integrates microbiota-derived signals to control expression of mammalian genes. Regulation by this histone deacetylase in the intestinal epithelium is required to maintain normal diversity of the microbiota and intestinal homeostasis.

Most significant FY2015 publication


What is the potential impact of this work?

This work highlights a new regulatory network in mammalian cells that mediates how intestinal epithelial cells respond to diverse microbiota-derived signals in the environment and potentially convey this information to other cells.

What does 2016 hold for your research?

My future research focuses on deciphering how this new microbial-driven pathway in the intestine regulates metabolism and immune responses to infection.

*Data provided by Cincinnati Children's Hospital Medical Center.
† Funds flow through Cincinnati Children's Hospital Medical Center.
‡ Publications were self-reported and include publications outside of research faculty.

For Department of Pediatrics data, please refer to the Cincinnati Children’s Hospital Medical Center annual report available at: cincinnatichildrens.org/research/Cincinnati/annual-report/2015/default
PRIMARY RESEARCH FOCUS

Coordinating a multidisciplinary team of scientists from academia and industry to develop a humanized anti-cocaine monoclonal antibody (mAb) intended for clinical use to prevent relapse in cocaine addicts.

This multidisciplinary translational research project has generated a humanized mAb with high affinity for cocaine and specificity over cocaine’s inactive metabolites.

FY2015 research highlights

Two years ago we met a key milestone in the development timeline when we demonstrated the feasibility of producing a reengineered recombinant humanized anti-cocaine mAb protein in gram quantities. Last year this recombinant mAb met the established go-no go milestone criteria set by our comprehensive battery of in vitro and in vivo tests of effectiveness that we developed specifically for this project. We demonstrated that the recombinant mAb antagonizes cocaine entry into the brain in mice, has a long elimination half-life in rodents and antagonizes the ability of cocaine to reinitiate cocaine self-administration in a rat model of cocaine addiction. All of these findings predict long-term effectiveness in clinical use. My collaborators also established that there is some heterogeneity of post-translational modifications of the recombinant mAb protein. Quantifying these heterogeneities guides the selection of the cell line to produce our lead candidate anti-cocaine mAb.

Most significant FY2015 publication


What is the potential impact of this work?

There are currently no FDA-approved medications for cocaine addiction. The new technology that allows the generation of humanized antibodies and other biologics for the treatment of several disorders may finally provide an effective therapeutic agent for cocaine addiction. If so, our work may provide insights into the pharmacological basis of drug addiction.

What does 2016 hold for your research?

In 2016 we aim to establish a Master Cell Bank, a Working Cell Bank and a GMP-compliant production platform that will provide the required quantities of purified anti-cocaine mAb protein. Beyond 2016, the overall goal of our studies is to provide the comprehensive toxicology studies and the in vivo efficacy studies in animal models of cocaine relapse and addiction that are required for inclusion in an Investigational New Drug (IND) application to the FDA.

‡ Publications were self-reported and include publications outside of research faculty.
**PRIMARY RESEARCH FOCUS**

Conducting multi-site comparative effectiveness trials testing pharmacologic and behavioral interventions for substance use disorders in the “real world” settings of community treatment programs.

Most of my research has focused on cocaine and nicotine dependence but the current opioid-use epidemic has shifted my focus to include opioid use disorder.

**FY2015 research highlights**

Individuals with opioid use disorder experiencing a non-fatal overdose are at heightened risk for future overdoses, but there are no interventions to facilitate their enrollment into substance abuse treatment, which would significantly decrease their risk of overdose. I created and piloted a computer-facilitated, peer-delivered, individually tailored secondary prevention intervention designed to: 1) encourage patients to initiate medication-assisted treatment and 2) increase knowledge about overdose risk factors and appropriate response.

**Most significant FY2015 publication**


**What is the potential impact of this work?**

There are no FDA-approved treatments for cocaine dependence. Pre-clinical research has found that buspirone significantly decreases cocaine self-administration/relapse. This multi-site clinical trial evaluating buspirone revealed that it was not effective in preventing cocaine-use relapse and that female participants receiving buspirone had worse cocaine-use outcomes than those receiving placebo. The discrepancy between the results of my trial and those of pre-clinical research, which was conducted only with males, may reflect gender differences in dopaminergic function and dopaminergic-agent response.

**What does 2016 hold for your research?**

I am conducting two smoking-cessation trials. The first is testing an investigational agent that works through a mechanism of action (modulation of glutamate receptors) that differs from those of existing FDA-approved smoking-cessation medications. The second uses a novel approach to evaluate smoking-cessation medications in methadone-maintained patients.

*Publications were self-reported and include publications outside of research faculty.*
RADIATION ONCOLOGY

Kris T. Huang, MD, PhD
Assistant Professor

DEPARTMENT RESEARCH DETAILS
Research faculty — 6
New awards — 0
Total research holdings — $0
Departmental publications — 14*
Research fellows — 0

PRIMARY RESEARCH FOCUS
Advanced medical imaging processing.

FY2015 research highlights
UC Tech Accelerator 2015 (UC + CincyTech) grant funding to advance the commercial case for Autofuse technology.

Most significant FY2015 publication

What is the potential impact of this work?
Autofuse uniquely provides fully automated deformable 3D image registration comparable to expert-directed image fusion with high accuracy. It eliminates the need for manual intervention during the registration process, dramatically reducing the time to complete the task while improving the precision of cancer treatments. Another project, an optical 3D sensing platform, will be used to accurately and precisely position patients during radiation treatments and may be used in the early diagnosis of lymphedema, which is a potential complication of breast cancer treatment that is best treated in its early stages.

What does 2016 hold for your research?
Under the UC Tech Accelerator, we will develop Autofuse into beta software for evaluation and potential commercialization. In combination with the forthcoming proton treatment center, I also look to bring another project, an optical feedback for radiation treatment delivery systems, to the next phase of development in collaboration with Varian Medical Systems and Cincinnati Children's Hospital Medical Center.

*Publications were self-reported and include publications outside of research faculty.
PRIMARY RESEARCH FOCUS

Stroke imaging.

I am actively involved in multidisciplinary collaborations with the Cerebrovascular and Stroke Center of the UC Neuroscience Institute.

FY2015 research highlights

In 2015, we were awarded a large industry contract for central imaging services for PRISMS (an investigator initiated, industry sponsored Phase IIIb, double blind, multicenter study). I am the Director of the Core Lab for PRISMS and am gaining valuable experience in comprehensive image management services including study set up services, coordination with study sites, quality control of imaging data, transmittal and archival and implementation of blinded reading services. This also integrates very well with my KL2 educational goal for this phase of my career in obtaining experience with acute stroke clinical trials.

Most significant FY2015 publication


What is the potential impact of this work?

Despite relatively mild deficits upon acute presentation, 30 percent of patients with mild stroke are significantly disabled at 90 days post-stroke. Our study suggests that functional outcome may be associated with size of the final infarct in mild strokes. In addition to final infarct volume, disability is also influenced by infarct locations that disrupt key functional neural network hubs. Imaging characteristics, such as infarct size and specific infarct location, may better predict long-term outcomes and help identify subgroups of patients in whom to test future novel reperfusion and rehabilitative therapies.

What does 2016 hold for your research?

We want to utilize advanced imaging techniques including lesion mapping, network mapping and diffusion tensor imaging to further understand pathophysiology of ischemic and hemorrhagic strokes. I am also the site PI for the NIH-funded DEFUSE 3 acute stroke trial, which will give me further practical experience in clinical trials.

*Publications were self-reported and include publications outside of research faculty.*
PRIMARY RESEARCH FOCUS

The beneficial manipulation of the host response to trauma and sepsis.

I am actively involved in multidisciplinary collaborations with the Cerebrovascular and Stroke Center of the UC Neuroscience Institute.

FY2015 research highlights

A critical clinical problem is that after trauma or sepsis, the susceptibility to lung infection is increased. Concurrently with this, the lung lipid environment is altered due to the decreased activity of the lipid modifying enzyme, Acid Sphingomyelinase, within cells and microvesicles. This results in an overall lung increase of ceramide and a decrease of sphingosine. We demonstrated that sphingosine can directly kill bacteria and postulate that decreased sphingosine increases the host susceptibility to lung infection. To counter this, we treated with aerosolized sphingosine prior to lung infection and observed decreased susceptibility. Further, we treated with recombinant neutral ceramidase prior to lung infection and also found improved survival and bacterial clearance. Altogether, we conclude that future methods to increase available sphingosine in the lungs of injured or septic patients may ameliorate infections and mortality.

Most significant FY2015 publication


What is the potential impact of this work?

We conclude in this publication that fecal transplantation may represent a novel therapy in restoring colon health after burn-injury.

What does 2016 hold for your research?

Our goal in 2016 is to engineer the increase of sphingosine content in microparticles or the infected environment in order to combat infections.

‡ Publications were self-reported and include publications outside of research faculty.
DEPARTMENT RESEARCH DETAILS

- Research faculty: 45
- New awards: 18
- Total research holdings: $10,487,505
- Departmental publications: 498
- Research fellows: 3

RESEARCH AWARDS
FY2015
The College of Medicine has introduced several new research awards to recognize faculty excellence across a broad spectrum of research activities. During this fiscal year, we introduced the Research Rising Star and Cross Cutting Research Awards.

**RESEARCH RISING STAR AWARD**

The Research Rising Star recognizes an Instructor or Assistant Professor who demonstrates outstanding research accomplishments and impact at the early career stage. The nominee should be well above the career benchmarks expected among peers. The Cross Cutting Research Awards recognizes an individual faculty member and/or a team of faculty members that has successfully created and sustained a multidisciplinary research team that significantly contributes to the mission of the College. (A team must consist of at least four full-time faculty members that each play a significant and inter-disciplinary role in the team.) The recipient of the Rising Star award, Christian Hong, PhD, Department of Molecular and Cellular Physiology, was nominated by Bob Highsmith, PhD, Interim Chair of Physiology and Interim Chair of Pharmacology.

**Christian Hong, PhD**

Department of Molecular and Cellular Physiology

Dr. Hong utilizes temporal information from the circadian clock and its molecular connections with other cellular processes such as the cell cycle to improve human health. His lab recently demonstrated that a cell cycle kinase is one of the molecular coupling components that connects the cell cycle and the circadian clock in the model filamentous fungus, Neurospora crassa. Dr. Hong has now extended his research to mammalian systems to uncover robust circadian rhythms in 3D organoid cultures from mouse small intestine and has established a 3D organoid platform to track both circadian rhythms and cell cycle in real-time. Dr. Hong currently leads a project titled “Uncovering general principles of network dynamics of circadian rhythms, cell cycle, DNA damage response, and metabolism as interconnected modules,” which is supported by the Defense Advanced Research Projects Agency (DARPA). Overall, Dr. Hong’s work addresses general principles of the interconnected network of circadian rhythms and the cell cycle, which will be critical for chronotherapy to identify the right target and timing for optimal disease treatments.
CROSS CUTTING RESEARCH LEADERSHIP AWARD

The recipient of the Cross Cutting Research Leadership award, Christy Holland, PhD, from the Department of Internal Medicine, Division of Cardiovascular Health and Disease, was nominated by Carl Fichtenbaum, MD, Department of Internal Medicine, Division of Infectious Diseases.

Christy Holland, PhD
Department of Internal Medicine
Division of Cardiovascular Health and Disease

This outstanding team of interdisciplinary collaborators is developing therapeutic ultrasound technology for the treatment of stroke and cardiovascular disease. Dr. Holland and her team have been a focal point and motivating force behind this research effort in the UC Heart, Lung, and Vascular Institute. Dr. Holland has created a culture of research support within the Image-Guided Ultrasound Therapeutics Laboratories such that each faculty member has received extramural funding for projects, has contributed to the research community through coauthored publications, and created a diverse portfolio of intellectual property.

CROSS CUTTING RESEARCH TEAM AWARD

The recipient of the Cross Cutting Research Team award, Cincinnati Interprofessional Care Collaborative, was nominated by Jack Kues, PhD, Associate Dean for Continuous Professional Development.

Cincinnati Interprofessional Care Collaborative

The Cincinnati Interprofessional Care Collaborative (CICC) has been working together since 2009. The group has grown to include clinicians, administrators, researchers and educators from a wide variety of professions and disciplines. They are unified by the theme of developing projects that are fundamentally interprofessional in their approach to improving health through practice-based innovations and quality improvement, with a strong element of research and professional development. The group has worked with faculty throughout the UC Academic Health Center, UC Health, Cincinnati Children’s Hospital, Cincinnati Department of Veterans Affairs Medical Center and community organizations. CICC-affiliated projects have been awarded over $6 million over five and a half years and the Collaborative has a success rate of 85 percent of grants submitted.
LIFETIME ACHIEVEMENT AWARDS

Recognition of faculty who have achieved a lifetime career of research success, managing a successful program that has contributed significantly to the scientific landscape and to the success of the College of Medicine is an important component of our research culture. The Lifetime Achievement Award series has been instituted this year to recognize and honor our faculty who have achieved this status.

This year’s recipients are Peter Stambrook, PhD, Department of Molecular Genetics, Biochemistry and Microbiology, and Shuk-Mei Ho, PhD, Chair of the Department of Environmental Health. These awards are given at a special ceremony where the recipient presents a seminar of their highlights and advances in their research area. Dr. Stambrook was honored on Aug. 19, 2015 and Dr. Ho was honored Oct. 1, 2015.

Peter Stambrook, PhD

Peter Stambrook, PhD, recognized by the University of Cincinnati in 2015 as a Distinguished Research Professor, joined the College of Medicine faculty in 1981. Currently he is Professor, Department of Molecular Genetics, Biochemistry and Microbiology, and serves as co-leader of the UC Cancer Institute’s Comprehensive Head and Neck Cancer Center. His research has resulted in numerous published articles showing how cells maintain and preserve their genetic makeup. In 2007, he was elected as a Fellow of the American Association for the Advancement of Science. He subsequently was awarded UC’s George Rieveschl Jr. Award for Distinguished Scientific Research (2013), the UC College of Medicine’s Daniel Drake Medal (2013), the Environmental Mutagenesis and Genomics Society Award for outstanding research contributions (2013) and the Distinguished Scientist Award from the Society for Experimental Biology and Medicine (2015).

Shuk-Mei Ho, PhD

Shuk-Mei Ho, PhD, recognized by the University of Cincinnati in 2015 with the George Rieveschl Jr. Award for Distinguished Scientific Research, joined UC in 2005 as Joseph P. Schmidlapp Professor and Chair of the Department of Environmental Health. In addition, she directs the Center for Environmental Genetics, the Genomics, Epigenomics and Sequencing Facility Core and the Cincinnati Cancer Center. She also holds the Hayden Family Endowed Chair for Cancer Research and serves as associate dean for basic research at the College of Medicine. She is internationally recognized for her expertise in the role of hormones and endocrine disruptors on disease development and tumor formation in the prostate, ovaries, endometrium and breast. She has been honored by the Ohio Senate and has received the Women in Urology Award from the Society for Basic Urologic Research and the Society of Women in Urology.
Brett Kissela, MD
Professor and Albert Barnes Voorheis Chair
Department of Neurology and Rehabilitation Medicine

Dawn Kleindorfer, MD
Professor, Department of Neurology and Rehabilitation Medicine

Brett Kissela, MD, and Dawn Kleindorfer, MD, received a National Institute of Neurological Disorders and Stroke R01, Comparison of Hemorrhagic and Ischemic Stroke Among Blacks and Whites. The award runs from 4/1/2015 to 3/30/2020 with total costs of $7,578,862. This study has examined racial disparities in stroke over the past 20 years. This study will continue to describe trends in stroke occurrence, recurrence, cause, treatment, and outcome in a biracial metropolitan population.

CO-INVESTIGATORS:
Achala Vagal, MD, Department of Radiology
Daniel Woo, MD, Department of Neurology and Rehabilitation Medicine
Simona Ferioli, MD, Department of Neurology and Rehabilitation Medicine
Matthew Flaherty, MD, Department of Radiology
Jane Khoury, PhD, Department of Pediatrics, Epidemiology and Biostatistics
Heidi Sucharew, PhD, Department of Pediatrics, Epidemiology and Biostatistics

SIGNIFICANT CONTRIBUTOR:
Joseph Broderick, MD, Department of Neurology and Rehabilitation Medicine

Alison Weiss, PhD
Professor, Department of Molecular Genetics, Biochemistry and Microbiology

Alison Weiss, PhD, received a National Institute of Allergy and Infectious Diseases U19, Organoids as a Model System for Studying Gastrointestinal Disease. The award runs from 3/1/2015 to 2/29/2020 with total costs of $6,767,258. This study will develop human gastrointestinal organoids as model systems to address transformative questions regarding gastrointestinal infectious diseases.

PROJECT LEADERS:
Yana Zavros, PhD, Department of Molecular and Cellular Physiology
Christian Hong, PhD, Department of Molecular and Cellular Physiology
James Wells, PhD, Department of Pediatrics
Sean Moore, MD, Department of Pediatrics

CO-INVESTIGATORS:
Michael Helmrath, MD, Department of Pediatrics
Bruce Yacyshyn, PhD, Department of Internal Medicine, Digestive Diseases

COLLABORATORS:
Mary Beth Yacyshyn, PhD, Department of Internal Medicine, Digestive Diseases
Christopher Mayhew, PhD, Department of Pediatrics
Andrew Norman, PhD
Professor, Department of Pharmacology and Cell Biophysics

Andrew Norman, PhD, received a National Institute on Drug Abuse U01, Advancing the Development of a Humanized Anti-cocaine Monoclonal Antibody. The award runs from 8/1/2015 to 5/31/2018 with total costs of $6,280,047. A unique humanized anti-cocaine monoclonal antibody (developed in the PI's lab) is at an advanced stage of preclinical development for the prevention of relapse in cocaine abusers and will be the focus of further pharmacology and preclinical toxicology studies as well as manufacturing and control protocols that are required to support an Investigational New Drug (IND) application to the FDA. An effective pharmacotherapy for cocaine abuse would have a major impact on this devastating public health problem.

CO-INVESTIGATORS:
William J. Ball, PhD, Department of Pharmacology and Cell Biophysics
Terry Kirley, PhD, Department of Pharmacology and Cell Biophysics
John Lorenz, PhD, Department of Molecular and Cellular Physiology
Vladimir Tsibulsky, PhD, Department of Pharmacology and Cell Biophysics

Mario Medvedovic, PhD
Associate Professor, Department of Environmental Health

Mario Medvedovic, PhD, received a National Heart, Lung and Blood Institute, Data Coordination and Integration Center for LINCS-BD2K. The award runs from 9/29/2014 to 4/30/2019 with total costs of $5,625,283. This team will contribute to the project by leading aims specific to: integrated knowledge environment, data science research collaborations, community training and outreach and consortium coordination and administration.

Siddarth Khosla, MD
Associate Professor, Department of Otolaryngology–Head and Neck Surgery
Director, UC Health Voice and Swallowing

Siddarth Khosla, MD, received a National Institute on Deafness and Other Communication Disorders R01, The Relationships Between Vortices, Acoustics, and Vibration in Vocal Fold Asymmetries. The award runs from 3/19/2015 to 2/28/2020 with total costs of $2,842,506. There is currently no consensus on optimal treatment for unilateral vocal fold paralysis; one main reason for this is a lack of understanding of the underlying mechanisms of how structural asymmetries found in unilateral paralysis, and the surgical treatments designed to correct these asymmetries, affect voice production. This study will elucidate these mechanisms using innovative methodology.

CO-INVESTIGATORS:
Ephraim Gutmark, PhD, DSc, Department of Aerospace Engineering and Engineering Mechanics, College of Engineering
Jun Ying, PhD, Department of Environmental Health
Liran Oren, PhD, Department of Otolaryngology–Head and Neck Surgery
Christy Holland, PhD  
Professor, Department of Internal Medicine, Cardiovascular Health and Disease Division  
Director, Image-Guided Ultrasound Therapeutics Laboratories  
Director of Research, Heart, Lung, and Vascular Institute  
Department of Biomedical Engineering  

Christy Holland, PhD, received a National Institute of Neurological Disorders and Stroke R01, Ultrasound-Assisted Thrombolysis for Stroke Therapy. The award runs from 8/15/2014 to 7/31/2019 with total costs of $2,764,157. Successful completion of these studies will elucidate the utility and potential risks of ultrasound-enhanced thrombolysis and ultrasound-mediated delivery of vasodilatory or cytoprotective gases and will provide important new information to assist the design of targeted agents to improve thrombolysis and neuroprotection in acute stroke treatment.

Alex Lentsch, PhD  
Professor, Department of Surgery  
Senior Associate Dean for Faculty Affairs and Development

Alex Lentsch, PhD, received a National Institute of Diabetes and Digestive and Kidney Disease R01, Chemokine/Exosome Axis and Liver Repair After Ischemia/Reperfusion. The award runs from 7/1/2015 to 6/30/2019 with total costs of $2,499,016. The knowledge gained by this study will provide important new insights and will lead to the development of new therapeutic approaches that could have significant impact on the treatment of a number of liver diseases/disorders.

Alvaro Puga, PhD  
Professor, Department of Environmental Health

Jack Rubinstein, MD  
Assistant Professor, Department of Internal Medicine, Cardiovascular Health and Disease Division

Alvaro Puga, PhD, and Jack Rubinstein, MD, received a NIH R01, Gene-Environment Interactions in the Fetal Origin of Adult Cardiac Disease. The award runs from 11/10/2014 to 10/31/2019 with total costs of $2,417,354. The studies will characterize how developmental perturbations of the AHR pathway (i.e., agonist exposure or ablation of the receptor) affect the cardiovascular system in the mammalian embryo.

COLLABORATORS INCLUDE:  
Daniel Prows, PhD, Department of Pediatrics  
Jaroslaw Meller, PhD, Department of Environmental Health  
Mary Beth Genter, PhD, Department of Environmental Health  
Michael Maier, PhD, Department of Environmental Health  
Michael Borchers, PhD, Department of Internal Medicine, Pulmonary, Critical Care and Sleep Medicine Division
James Herman, PhD  
Professor, Department of Psychiatry and Behavioral Neuroscience  
Director, Laboratory of Stress Neurobiology  

James Herman, PhD, Professor, Director of the Laboratory of Stress Neurobiology, Department of Psychiatry and Behavioral Neuroscience, is recognized for his recent National Institute of Mental Health R01, Functional Anatomy of Limbic-Neuroendocrine Circuits. The award runs from 8/15/2014 to 6/30/2019 with total costs of $2,287,381. Data obtained from this research will provide novel information on brain circuits and mechanisms mediating stress effects on emotion, which will be of considerable value in the design of interventions and therapies designed to attenuate the public health impact of emotional pathologies.

Marshall (Chip) Montrose, PhD  
Professor, Department of Molecular and Cellular Physiology  
Dean of the Graduate School  

Marshall (Chip) Montrose, PhD, received a National Institute of Diabetes and Digestive and Kidney Disease R01, Mechanisms of Essential Calcium Signaling during Gastric Epithelial Wound Healing. The award runs from 5/1/2015 to 4/30/2019 with total costs of $2,014,132. The study focuses on the newly discovered role of Ca2+ signaling as an essential component for repairing the layer of cells lining the stomach, and seeks to learn how these signals are altered by the challenges of exposure to non-steroidal anti-inflammatory drugs or H. pylori.

CO-INVESTIGATOR:  
Eitaro Aihara, PhD, Department of Molecular and Cellular Physiology

Frank McCormack, MD  
Professor, Department of Internal Medicine  
Director, Division of Pulmonary, Critical Care and Sleep Medicine  

Frank McCormack, MD, received a National Heart, Lung and Blood Institute R01, Pathogenesis-Driven Therapeutic Development for Pulmonary Alveolar Microlithiasis. The award runs from 4/1/2015 to 3/31/2019 with total costs of $1,987,676. This work will study the rare lung disease pulmonary alveolar microlithiasis (PAM). Genetic mutations result in loss of a key phosphate transporter in the lungs, which results in the formation of stones in the airspaces. The project is focused on developing biomarkers and therapies for PAM using a mouse model of the disease as a platform for exploring disease pathogenesis and designing trials.

CO-INVESTIGATORS:  
Hassane Amlal, PhD, Department of Internal Medicine, Nephrology and Hypertension Division  
Jason Woods, PhD, Department of Pediatrics  
James Bridges, PhD, Department of Pediatrics
Ying Xia, PhD
Associate Professor, Department of Environmental Health

Ying Xia, PhD, received a NIH R01, The Role of MAP 3 Kinase 1 in Ocular Surface Morphogenesis. The award runs from 12/01/2014 to 11/30/2019 with total costs of $1,975,729. The studies will explore mechanisms underlying similar developmental processes where an epithelial hole has to close by morphogenetic force; will uncover the genesis of congenital eye anomaly and facilitate the identification of high-risk populations for targeted prevention and intervention.

COLLABORATORS INCLUDE:
Alvaro Puga, PhD, Department of Environmental Health
Winston Kao, PhD, Department of Ophthalmology

Patrick Tso, PhD
Professor, Department of Pathology and Laboratory Medicine
Director, Mouse Metabolic Phenotype Center

Patrick Tso, PhD, received a National Institute of Diabetes and Digestive and Kidney Disease R01, Apolipoprotein AV and Intestinal Transport. The award runs from 4/1/2015 to 3/31/2020 with total costs of $1,974,113. This research will advance our understanding of the gastrointestinal physiology of apoAV and provide insights and potential targets for the clinical management of hypertriglyceridemia.

CO-INVESTIGATOR:
Philip Howles, PhD, Department of Pathology and Laboratory Medicine

David Hui, PhD
Professor, Department of Pathology and Laboratory Medicine
Director, Metabolic Diseases Research Center

David Hui, PhD, received a NIH R01, LDL Receptor Related Protein-1 in Metabolic and Cardiovascular Disease. The award runs from 2/1/2015 to 2/29/2020 with total costs of $1,777,969. The studies will establish new paradigms of liver disease progression and offers novel approaches for treatment of metabolic and liver diseases.

COLLABORATORS INCLUDE:
George Thomas, PhD, Department of Internal Medicine, Hematology Oncology
Sara Kozma, PhD, Department of Internal Medicine, Hematology Oncology
Thomas Thompson, PhD
Associate Professor, Department of Molecular Genetics, Biochemistry and Microbiology

Thomas Thompson, PhD, received a National Institute of General Medical Sciences R01, Structure-Function Investigation of DAN mediated BMP Antagonism. The award runs from 4/1/2015 to 1/31/2019 with total costs of $1,700,405. This study will help define important molecular details that will support the development of current therapeutic efforts aimed at targeting DAN antagonists in diseases such as chronic kidney disease, and support the development of stem cell protocols aimed at generating specialized cell types, such as atrial cardiomyocytes.

Atsuo Sasaki, PhD
Assistant Professor, Department of Internal Medicine, Hematology Oncology Division

Atsuo Sasaki, PhD, received a National Institute of Neurological Disorders and Stroke R01, Targeting the Novel PI5P4K Pathway to Induce Glioblastoma Senescence. The award runs from 9/30/2014 to 8/31/2019 with total costs of $1,670,215. Researchers will test the hypothesis that inhibition of PI5P4Kβ (phosphatidylinositol-5-phosphate 4-kinase-β) will serve as a new therapeutic strategy against GBM. This study will use pharmacological and molecular approaches that target PI5P4Kβ in GBM cell culture and in GBM animal tumor models.

Vladimir Bogdanov, PhD
Professor, Department of Internal Medicine
Director, Hemostasis Research Program

Vladimir Bogdanov, PhD, received a National Cancer Institute R01, Alternatively Spliced Tissue Factor and Pathobiology of Pancreatic Cancer. The award runs from 4/9/2015 to 3/31/2020 with total costs of $1,396,170. This study strives to open new avenues to fight pancreatic ductal adenocarcinoma and other types of cancer where alternatively spliced Tissue Factor contributes to the pathogenesis of disease.

CO-INVESTIGATOR:
Xiaoyang Qi, PhD, Department of Internal Medicine

Fred Finkelman, MD
Professor, Department of Internal Medicine Immunology, Allergy and Rheumatology Division

Fred Finkelman, MD, received a National Institute of Allergy and Infectious Diseases R01, Suppression of IgE-Mediated Disease by Polyclonal Rapid Desensitization. The award runs from 7/15/2014 to 6/30/2018 with total costs of $1,334,589. Omalizumab, a mAb that binds IgE that is not bound to FcεRI, is useful for treating severe asthma and shows promise in the treatment of other allergic disorders, but is ineffective in individuals who have very high IgE levels and is relatively slow-acting. This novel therapeutic approach should be more rapid and effective.
William Ridgway, MD
Professor, Department of Internal Medicine
Director, Division of Immunology, Allergy and Rheumatology

William Ridgway, MD, received a National Institute of Diabetes and Digestive and Kidney Disease R01, dnTGF Beta RII Mice and PBC. The award runs from 8/11/2014 to 6/30/2018 with total costs of $1,324,088. In these adoptive transfer studies, researchers will conduct bone marrow chimeric experiments, frequency and phenotype analysis, and cytokine production by CD8 cells.

Guo-chang Fan, PhD
Associate Professor, Department of Pharmacology and Cell Biophysics

Guo-chang Fan, PhD, received a NIH R01, Duplex miR-223 and Exosomes in Sepsis. The award runs from 1/1/2015 to 12/31/2018 with total costs of $1,215,113. The studies will investigate novel therapeutic tools for transferring those beneficial factors into the septic heart, thereby resulting in an improved contractile function.

COLLABORATORS INCLUDE:
Charles Caldwell, PhD, Department of Surgery
Basilia Zingarelli, MD, PhD, Department of Pediatrics

Chandrashekhar Gandhi, PhD
Professor, Department of Surgery

Chandrashekhar Gandhi, PhD, received a VA Merit Award, Mechanisms of Liver Failure. The award is for $1,060,012. Dr. Gandhi is an established VA investigator in the field of liver patho-biology, with an emphasis on the role of hepatic stellate cells in liver injury and immunological tolerance. His present proposal is aimed at delineating the mechanisms of acute liver failure with stellate cells as the main cell type orchestrating the initiation and progression of this pathology. It is predicted that this understanding will lead to novel therapeutic interventions for our veterans.

Shuk-Mei Ho, PhD
Professor and Chair, Department of Environmental Health

Shuk-Mei Ho, PhD, received a VA Merit Award, Estrogen-Based Combinatorial Therapies for Castration-Resistant Prostate Cancer. The award is for $1,033,015. Dr. Ho is an established VA investigator in the field of prostate cancer. Her VA Merit Award is aimed at targeting the GPER1 receptor in advanced castration-resistant human prostate cancers. This novel approach is likely to improve the treatment modalities of our veteran population with advanced prostate cancers.
Susan Waltz, PhD  
Professor, Department of Cancer Biology  

Susan Waltz, PhD, received a VA Merit Award, Ron Receptor Tyrosine Kinase Signaling in Breast Cancer. The award is for $1,029,228. Dr. Waltz is an established VA investigator in the field of cancer and cell biology. This study will identify a pathway, namely the Ron receptor tyrosine kinase and its ligand, hepatocyte growth factor-like protein (HGFL), which supports breast cancer growth and metastasis. The goal of this VA Merit Award is to define the cell-type specific mechanisms by which Ron and HGFL function to promote breast cancer and to validate the use of targeting Ron and/or HGFL as a therapy for treating breast cancer patients to prolong survival and alleviate suffering for our veterans.

Jun-lin Guan, PhD  
Professor and Chair, Department of Cancer Biology  

Jun-lin Guan, PhD, received a National Cancer Institute R01, Genetic Analysis of FAK Kinase and Scaffold Functions in Breast Cancer. The award runs from 4/1/2014 to 3/31/2017 with total costs of $984,069. These studies will provide significant insights into the molecular and cellular mechanisms of breast cancer that may contribute to novel therapies for this devastating disease.

Rajat Madan, MD, PhD  
Assistant Professor, Department of Internal Medicine  
Infectious Diseases Division  

Rajat Madan, MD, PhD, received a National Institute of Allergy and Infectious Diseases K08, Role of Leptin in Mucosal Protection During Clostridium difficile Infection. The award runs from 1/1/2015 to 7/31/2019 with total costs of $979,476. This study will expand our knowledge of host immune responses to C. difficile infection and have the potential to discover new targets for better, host-directed therapies for treatment of C. difficile colitis.

Melanie T. Cushion, PhD  
Professor, Department of Internal Medicine  
Senior Associate Dean for Research  

Melanie T. Cushion, PhD, received NIH TASK A63, Pneumocystis Murina Small Animal Model Utilization for Therapeutic Evaluation. The award runs from 5/1/2014 to 4/30/2015 with total costs of $967,430. The major activity to be performed under this task order is the evaluation of therapeutic candidates for treatment or prevention of pneumocystosis using a small animal model of severe pneumocystosis.
Renu Sah, PhD
Associate Professor, Department of Psychiatry and Behavioral Neuroscience

Renu Sah, PhD, received a VA Merit Award, Microglial Mechanisms in Panic-PTSD. The award is for $950,995. Dr. Sah is an established VA investigator in the field of psychiatry. Her VA Merit Award will examine how microglial mechanisms may provide important leads into how exposure to traumatic stress can lead to panic pathophysiology. This association is critical to the pathophysiology of panic comorbid with PTSD in veterans and may lead to more specific and effective therapies.

Judith Feinberg, MD
Professor, Department of Internal Medicine

Judith Feinberg, MD, received a Centers for Disease Control and Prevention U01, Southern Ohio Prevents Hepatitis Project (StOPHeP). The award runs from 9/30/2014 to 9/29/2017 with total costs of $899,859. Injection drug use (IDU) among young adults in rural areas and the resultant epidemic of chronic hepatitis C has become a significant public health problem, but there are few data about the demographics and risk behaviors of rural IDUs to inform public health policies and practice. The use of Peer Navigators and social media will help provide peer support for isolated individuals and ensure study retention and linkage to care.
Katelyn Melgar

Katelyn Melgar, a student in the College of Medicine’s Medical Scientist Training Program, received a 2015 Minority Graduate Student Abstract Achievement Award from the American Society of Hematology (ASH) and presented her abstract “Novel Small Molecule FLT3 Inhibitors for the Treatment of FLT3-ITD AML,” at the 57th ASH annual meeting Dec. 5-8, 2015 in Orlando. Each year, ASH offers these awards, which are merit-based, to select graduate students to acknowledge the accomplishments of and retain minority graduate students in the field of hematology through exposure to its annual meeting. Melgar’s focus is on immunology, and she’s currently in the lab of Daniel Starczynowski, PhD, associate professor in UC’s Department of Pediatrics and a researcher in the Division of Experimental Hematology and Cancer Biology at Cincinnati Children’s Hospital Medical Center.

Subramanian Vignesh

Kavitha Subramanian Vignesh, PhD, in the laboratory of George Deepe, MD, Department of Internal Medicine, Division of Infectious Diseases, received a 2015 Postdoctoral Fellowship Award from the American Heart Association for the project titled, “Interleukin-4 Regulates Zinc Homeostasis to Weaken Macrophage Antifungal Defense.” Subramanian Vignesh also received a New Investigator Scholar Award from the UC Center for Environmental Genetics funded by the National Institutes of Environmental Health Sciences for the project titled “Zinc regulation by interleukin-4 shapes macrophage phenotype to promote survival of a medically important fungal pathogen.”

UC Plastic Surgery Residents

University of Cincinnati residents received the Best Clinical and Best Poster awards at the Ohio Cup, held during the Annual Scientific Meeting of the Ohio Valley Society of Plastic Surgeons (OVSPS), May 29-31, 2015, in Covington, Ky. There were 125 residents, program directors and chiefs involved as well as practicing surgeons from five states and institutions including Pittsburgh, Cleveland Clinic, Case Western, Ohio State University, Summa and Indiana University. The Ohio Cup gave recognition in the areas of Best Overall, Best Clinical, Best Research and Best Poster with runners up in clinical and research. The OVSPS highlights new technologies, new treatment modalities and new techniques in plastic and reconstructive surgery and serves to educate these individuals on patient safety topics and research occurring within the region to expand the breadth and scope of plastic surgeons. Specifically, the meeting included didactic and panel presentations to generate discussion involving new concepts and controversies in plastic surgery.
**Shahana Prakash**

Shahana Prakash, a junior studying biology with a minor in medical sciences, received a 2015 Undergraduate Research Fellowship from the American Physiological Society (APS). Fellowship recipients spend the summer in the laboratory of an established scientist and APS member. Each fellow receives a $4,000 stipend during the 10-week fellowship and an additional $1,300 in travel funds to present research at the Experimental Biology 2016 meeting in San Diego. Prakash will do research in the laboratory of Bryan Mackenzie, PhD, associate professor in the Department of Molecular and Cellular Physiology.

**Brandon Tan**

Brandon Tan, College of Medicine Class of 2017, was selected as part of the National Institutes of Health (NIH) Medical Research Scholars Program (MRSP). The program includes 55 participants who will represent 37 U.S.-accredited universities. A year-long residential program, the MRSP introduces medical, dental and veterinary students to cutting-edge research, part of NIH’s goal of training the next generation of clinician-scientists and biomedical researchers. The program places creative, research-oriented students in NIH laboratories and clinics, including within the NIH Clinical Center, to conduct basic, clinical or translational research in areas that match their career interests and research goals.

**Taylor Brooks**

Taylor Brooks, College of Medicine Class of 2018, was named among the 2015 Carolyn L. Kuckein Student Research Fellowship recipients by Alpha Omega Alpha Medical Society, a professional medical organization, which recognizes and advocates for excellence in scholarship and the highest ideals in the profession of medicine. The Carolyn L. Kuckein Student Research Fellowship emphasizes a student designed and initiated project with an academic mentor. Brooks’ project was NK Cell Crosstalk with Myeloid Suppressor Cells Promotes Chronic Infection. His mentor was Stephen Waggoner, PhD, Department of Pediatrics; and his counselor was Robert Luke, MD.
UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE

College Leadership
William S. Ball, MD
Senior Vice President for Health Affairs and Dean

Melanie T. Cushion, PhD
Senior Associate Dean for Research

Andrew T. Filak, MD
Senior Associate Dean for Academic Affairs

Alex B. Lentsch, PhD
Senior Associate Dean for Faculty Affairs & Development

Lori A. Mackey
Senior Associate Dean for Operations and Finance, Chief Financial Officer

Myles L. Pensak, MD
Senior Associate Dean for Clinical Programs

Christopher J. Lindsell, PhD
Associate Dean for Clinical Research

Faculty
Tenure/Tenure Track.................................................... 384
Clinical Track............................................................... 1,194
Research Track.............................................................. 166
Field Service Track....................................................... 40
Educator Track.............................................................. 10
Volunteer/Adjunct/Visiting............................................. 562

All Funds Operating Revenue FY2015 (in millions)
Clinical Practice........................................................... $550.3
Federal/Non-Federal Research....................................... 256.7
Hospitals........................................................................ 214.0
State Appropriations..................................................... 46.3
Gift and Endowment Income............................................ 67.7
Other Income................................................................. 75.5
Tuition........................................................................... 33.8
Total Operating Revenue.............................................. $1,244.3

College of Medicine Facilities
Buildings......................................................................... 15
Research Space (net square feet)................................. 499,143
Total Space (gross square feet)................................. 1.95 million

Development
Total Dollars Raised (fund year 2015)......................... $26,064,123
College of Medicine Endowments........................... $449,976,739
(market value as of 6/30/2015)
Notice of Nondiscrimination

The University of Cincinnati does not discriminate on the basis of disability, race, color, religion, national origin, ancestry, medical condition, genetic information, marital status, sex, age, sexual orientation, veteran status or gender identity and expression in its programs and activities.

The university does not tolerate discrimination, harassment or retaliation on these bases and takes steps to ensure that students, employees and third parties are not subject to a hostile environment in university programs or activities.

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UC is committed to the ideal of universal Web accessibility and strives to provide an accessible Web presence that enables all university community members and visitors full access to information provided on its websites. Every effort has been made to make these websites as accessible as possible in accordance with the applicable guidelines.

The following person has been designated to handle inquiries regarding discrimination, harassment, or retaliation based on disability, race, color, religion, national origin, ancestry, medical condition, genetic information, marital status, age and veteran status:

Tamie Grunow  
Sr. Associate Vice President & Chief Human Resources Officer  
Section 504, ADA, Age Act Coordinator  
340 University Hall, 51 Goodman Drive  
Cincinnati, OH 45221-0039  
513-556-6381; grunowt1@ucmail.uc.edu

The following person has been designated to handle inquiries regarding discrimination, harassment or retaliation based on sex, sexual orientation, gender and gender identity or expression:

Karla Phillips  
Interim Title IX Coordinator  
3115 Edwards 1, 45 Corry Blvd.  
Cincinnati, OH 45221  
513-556-3349; karla.phillips@uc.edu