



COLLEGE OF MEDICINE
Research Annual Report 2016

**COLLEGE OF MEDICINE
OFFICE OF RESEARCH**

Melanie T. Cushion, PhD
Senior Associate Dean for Research

Christopher J. Lindsell, PhD
Associate Dean for Clinical Research

Peter Koch
Associate Dean for Research Operations

Brianne Sheehan
Program Director

Ranked **No. 40** among research medical schools

—U.S. News & World Report

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 is the second oldest public medical school in the country.

In recent years, numerous research breakthroughs have been made at the College of Medicine, including:

- Identifying two genes that convey a risk of heart failure 10 times greater than that faced by people who do not carry the gene and that by far the greater risk was in African Americans.
- Demonstrating for the first time that a response to a drug can be predicted from an individual's own DNA using genomic markers called haplotypes.
- Identifying a viral protein — VP16 — as the molecular key that prompts herpes simplex virus to exit latency and cause recurrent disease.
- Determining that the drug sirolimus could stabilize lung function in people with Lymphangiomyomatosis, a rare, life-threatening lung disease mostly affecting women.
- Identifying a genetic variant in a calcium-binding protein -- histidine-rich calcium binding protein — that can be linked to heart rhythm dysfunction.
- Determining that the circulation of cholesterol is regulated in the brain by the hunger-signaling hormone ghrelin, pointing to a new potential target for the pharmacologic control of cholesterol levels.
- Discovering SapC-DOPS, the combination of a lysosomal protein saposin C (SapC), and a phospholipid, known as dioleoylphosphatidylserine (DOPS), that assembled into tiny cavities, or nanovesicles, can target and kill many forms of cancer cells.

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 — with a center for metabolic health serve as the foundation for these commitments.

CONTENTS

From the Dean's Office 3

Dean William S. Ball, MD, Melanie T. Cushion, PhD, and Christopher J. Lindsell, PhD

Research Data 4

Highlighted Researchers 7

Anesthesiology	8
Biomedical Informatics	9
Cancer Biology	10
Dermatology	11
Emergency Medicine	12
Environmental Health	13
Family and Community Medicine	14
Hoxworth Blood Center	15
Internal Medicine	16
Medical Education	17
Molecular and Cellular Physiology	18
Molecular Genetics, Biochemistry and Microbiology	19
Neurology and Rehabilitation Medicine	20
Neurosurgery	21
Obstetrics and Gynecology	22
Ophthalmology	23
Orthopaedic Surgery	24
Otolaryngology — Head and Neck Surgery	25
Pathology and Laboratory Medicine	26
Pediatrics	27
Pharmacology and Cell Biophysics	28
Psychiatry and Behavioral Neuroscience	29
Radiation Oncology	30
Radiology	31
Surgery	32

Research Awards FY2016 33

Clinical Trialist of the Year	34
Health Research Rising Star Award	35
Research Service Awards	36
Distinguished Research Professor	39
Lifetime Achievement Award	39
Largest Research Awards FY2016	40
Faculty Research Honors	50
Student / Resident Awards	54

University of Cincinnati College of Medicine 56



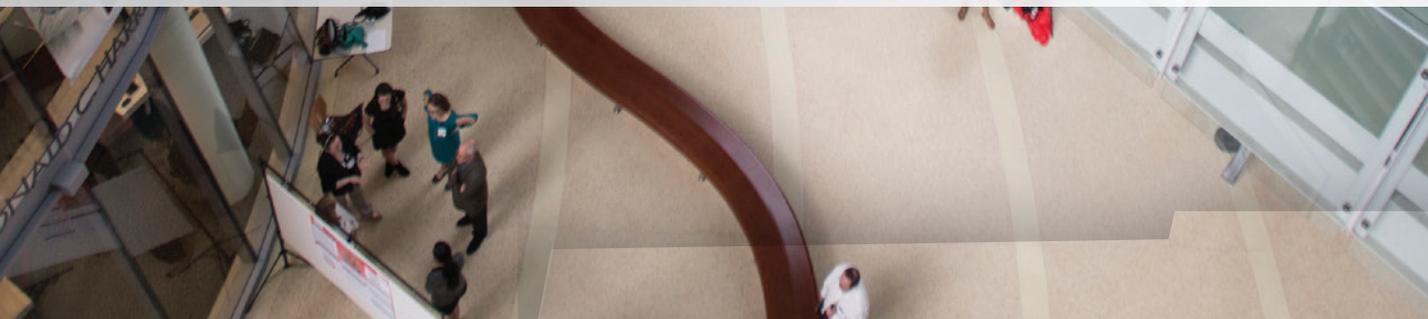
William S. Ball, MD



Melanie T. Cushion, PhD



Christopher J. Lindsell, PhD



FROM THE DEAN'S OFFICE

The 2016 Research Annual Report of the University of Cincinnati College of Medicine charts not only our outstanding progress toward the aspirational goals of the College's strategic plan, but also clearly establishes the abilities of our faculty as research leaders at UC, nationally and internationally. The accomplishments of our faculty reflect our commitment, to career success of our investigators, investments in the renewal of our research commitment and the deployment of new knowledge and therapies that improve the lives of patients locally and globally. The number of new research grants awarded has returned to FY2013 levels, reversing recent declines. Our faculty have risen to the challenges presented by the research funding environment with success rates that exceed the national average. These efforts have increased the new grants awarded during each of the last three years, from \$67 million in 2014 to \$159 million in 2016. This 137 percent increase is exemplary in an era of tight federal budgets. While we are on track to continue this growth during FY2017, we recognize that sustainability will require new investments in research both from the College, as well as the university.

The growth in basic research brought about by our scientists at the bench ultimately translates to innovations in clinical care at the bedside; testimony to the academic difference that we as a college at UC provide to the community. Our basic, translational and clinical research activities continue to grow, with thousands of patients offered access to cutting edge research by our physicians each year. Our faculty are increasingly sought after for their expertise in clinical trials, and we are leading a number of large federally funded trial networks.

We recognize what a remarkable accomplishment by our faculty that this has been, and we commend our research community on the significant effort this represents. Our pledge is to continue this transformation by investing in our people, innovating our educational programs and advancing scientific discovery through enhanced partnerships across the Academic Health Center, the university, our affiliates and globally. We especially value our growing research relationship with our faculty at Cincinnati Children's Hospital Medical Center.

The process of developing the strategic plan for the College has challenged us to improve our operational efficiencies, institutionalizing assessment as a means to guide decision-making for infrastructure revitalization and chartering faculty-driven committees as a means to guide space usage and core innovation. We recognize the integral roles our faculty, staff, trainees, students, alumni and all stakeholders play in our mutual success. This annual report celebrates their collective efforts and contributions.

In this report, you will discover the major accomplishments by investigators each department chose to highlight for their research achievements. Our publications describe the basic discoveries, translational science, clinical trials and outcomes research that are hallmarks of a great college of medicine.

In this next year, our goal is to establish sustainability as the new "norm" as we lay the foundations for the next levels to which we can, together, take the College. The coming year will see broad-based implementation of our new strategic plan that includes recruitment of new faculty to enhance our discovery sciences and facilitate translation of these discoveries to improve health and clinical care, foster scientific curiosity and investigation for students in our new undergraduate program and create an environment of advanced clinical care that surpasses any in the region.

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

DEPARTMENTS WITH RESEARCH HOLDINGS FY2016

University of Cincinnati
College of Medicine



For Department of Pediatrics data, please refer to Cincinnati Children's Hospital Medical Center annual report available at: cincinnatichildrens.org/research/Cincinnati/annual-report/2016

Department	Amount
Academic Affairs	\$223,514
Anesthesiology	\$2,669,518
Cancer Biology	\$11,173,285
Center for Clinical & Translational Science & Training	\$8,375,368
College of Medicine	\$2,634,884
Dermatology	\$908,827
Diversity and Community Affairs	\$60,000
Emergency Medicine	\$4,429,231
Environmental Health	\$27,991,594
Family and Community Medicine	\$2,610,251
Hoxworth Blood Center	\$3,248,773
Internal Medicine	\$32,292,237
Medical Education	\$11,000
Molecular and Cellular Physiology	\$5,677,826
Molecular Genetics, Biochemistry and Microbiology	\$5,648,510
Neurology and Rehabilitation Medicine	\$19,799,642
Neurosurgery	\$1,180,758
Obstetrics and Gynecology	\$2,765,249
Office of Research	\$531,409
Ophthalmology	\$1,697,064
Otolaryngology-Head and Neck Surgery	\$1,276,655
Pathology and Laboratory Medicine	\$10,105,124
Pediatrics (College of Medicine)	\$247,377
Pharmacology and Cell Biophysics	\$7,542,770
Psychiatry and Behavioral Neuroscience	\$29,880,957
Radiology	\$3,914
Research and Graduate Education	\$508,609
Research Operations	\$22,800
Surgery	\$15,613,084
UC Cancer Programs	\$43,479
TOTAL	\$198,642,310



DEPARTMENTS WITH NEW AWARDS FY2016

Department		Amount
Academic Affairs	2	\$197,318
Anesthesiology	6	\$4,889,627
Cancer Biology	8	\$4,929,844
Center for Clinical & Translational Science & Training	2	\$17,682,163
Dermatology	1	\$406,258
Emergency Medicine	8	\$2,052,888
Environmental Health	20	\$13,758,027
Family and Community Medicine	9	\$825,008
Hoxworth Blood Center	8	\$829,630
Internal Medicine	55	\$14,205,389
Molecular and Cellular Physiology	5	\$1,693,738
Molecular Genetics, Biochemistry and Microbiology	4	\$2,562,377
Neurology and Rehabilitation Medicine	7	\$11,997,858
Neurosurgery	4	\$5,016,557
Obstetrics and Gynecology	1	\$718,907
Ophthalmology	1	\$30,000
Otolaryngology-Head and Neck Surgery	1	\$996,019
Pathology and Laboratory Medicine	7	\$3,412,238
Pediatrics (College of Medicine)	2	\$730,928
Pharmacology and Cell Biophysics	1	\$27,000
Psychiatry and Behavioral Neuroscience	19	\$25,803,545
Surgery	19	\$47,142,100
TOTAL	190	\$159,907,420

463
RESEARCH FACULTY

309
FACULTY WITH
SPONSORED
RESEARCH

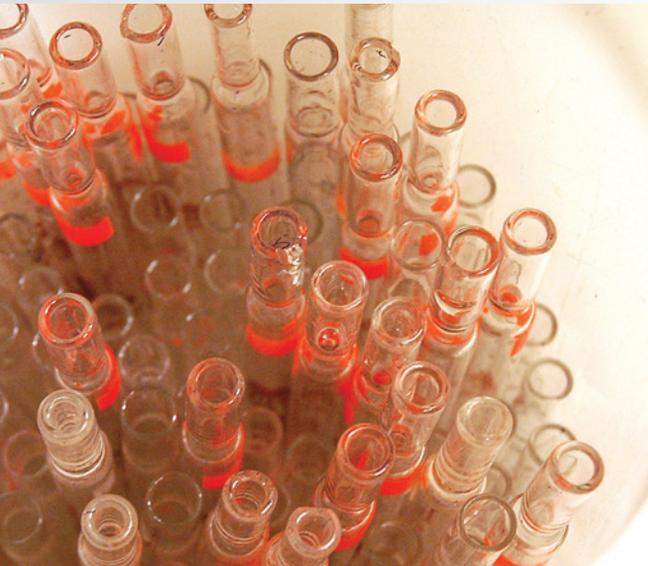
214
FACULTY WHO
WERE PRINCIPAL
INVESTIGATORS ON
ONE OR MORE
SPONSORED AWARDS

INDUSTRY SPONSORED CLINICAL TRIALS

Total Revenues FY2016



\$10,618,318



HIGHLIGHTED RESEARCHERS

FY2016

ANESTHESIOLOGY



Jun-Ming Zhang, MD

Professor and Vice Chair for Research

DEPARTMENT RESEARCH DETAILS

Research faculty — **7**

New awards — **6**

Total research holdings — **\$2,669,518**

Departmental publications — **15[^]**

Research fellows — **2**

PRIMARY RESEARCH FOCUS

The physiology and pathophysiology of pain.

FY2016 research highlights

- Demonstrated the importance of local sympathetic innervation in the maintenance of immune homeostasis and the persistence of pain.
- Examined roles of sodium channel Nav β 4 subunit and the fast resurgent sodium currents in mediating inflammatory low back pain.
- Established a rodent model of sciatic-endometriosis.
- Initiated a pilot study to assess extended regional anesthesia for prevention of chronic pain after traumatic injury.

Most significant FY2016 publication

Xie W, Chen S, Strong JA, Li A-L, Lewkowich IP, Zhang J-M. Localized sympathectomy reduces mechanical hypersensitivity by restoring normal immune homeostasis in rat models of inflammatory pain. *J Neurosci.* 2016, 36:8712-25.

What is the potential impact of this work?

Sympathetic blockade is used for many pain conditions but preclinical studies show both pro- and anti-nociceptive effects. The sympathetic nervous system also has both pro- and anti-inflammatory effects on immune tissues and cells. We examined effects of a very localized sympathectomy. By cutting the gray rami to the spinal nerves near the lumbar sensory ganglia, we avoided widespread sympathetic denervation. This procedure profoundly reduced mechanical pain behaviors

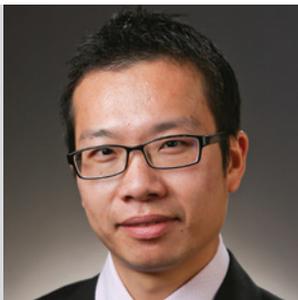
induced by a back pain model and a model of peripheral inflammatory pain. One possible mechanism was reduction of inflammation in the sympathetically denervated regions. This raises the possibility that therapeutic interventions targeting gray rami might be useful in some inflammatory conditions.

What does 2017 hold for your research?

Our research is currently funded by three separate R01 grants from the NIH and one grant from the U.S. Air Force. A short-term goal of our group is to continue the ongoing projects focusing on the neurological mechanism of chronic pain including chronic low back pain and intractable neuropathic pain. The long-term goal is to move our bench research findings to clinical trials. We have made great progress in assembling a team that combines expertise from research scientists and clinical faculty to carry out clinical studies.

[^] All department publications were self-reported and include publications outside of research faculty.

BIOMEDICAL INFORMATICS



Yizhao Ni, PhD

Instructor

DEPARTMENT RESEARCH DETAILS

Research faculty — **2**

New awards — **0**

Total research holdings — **\$0**

Departmental publications — **56[^]**

Research fellows — **0**

PRIMARY RESEARCH FOCUS

The development of machine learning (ML), natural language processing (NLP) and information retrieval techniques to assist clinical decision-making.

My research aims to improve the quality of health care by: (1) providing more effective provisioning of usable data (efficiency), (2) helping clinicians generate more objective clinical decisions (effectiveness), and (3) providing more reliable proactive prediction of clinical outcomes (safety). To achieve these objectives, I collaborate with clinical providers, information service administrators and biomedical and computational scientists.

FY2016 research highlights

Leveraging NLP and information retrieval technologies, my team successfully developed a prototype automated system for clinical trials eligibility screening. Utilizing advanced ML methodology, we also developed an automated algorithm to predict patients' responses to clinical trial invitations to facilitate patient recruitment. I was awarded a grant by the Cincinnati Children's Innovation Fund to continue this line of research. My team also develops electronic health record-based data analytics to support clinical decision-making. In addition to my research, I serve as a ML specialist in multiple quality improvement projects.

Most significant FY2016 publication

Ni Y, Beck AF, Taylor R, Dyas J, Solti I, Grupp-Phelan J, Dexheimer JW. Will they participate? Predicting patients' response to clinical trial invitations in a pediatric emergency department. Journal

of the American Medical Informatics Association. 2016; 23(4):671-80.

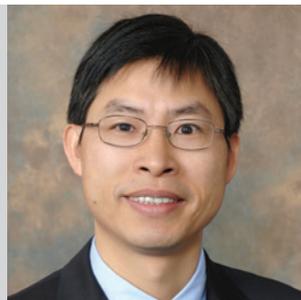
What is the potential impact of this work?

This work utilized ML technologies to predict whether people will agree to participate in clinical trials. The algorithm adjusted how to weigh factors such as education and socioeconomic status to better identify participants' attitudes, hence ignoring assumptions and biases that might have existed among staff recruiters. The work holds promise to use big data and computerized technologies to significantly accelerate patient recruitment.

What does 2017 hold for your research?

We will continue to develop and apply ML technologies in areas of clinical informatics. Our team will continue participating in a variety of research projects, including development of phenotype algorithms for specific diseases; medication safety in intensive care units; sustainable surveillance of diabetes; detection of surgery cancellation; and automated patient screening. By collaborating with other clinical departments, we aim to deliver high-quality research in clinical informatics to improve the efficiency, efficacy and safety of our health care.

CANCER BIOLOGY



Jianjun Chen, PhD

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **19**

New awards — **8**

Total research holdings — **\$11,173,285**

Departmental publications — **83[^]**

Research fellows — **28**

PRIMARY RESEARCH FOCUS

DNA/RNA epigenetics and translational research in cancers.

We are interested in discovering novel genetic and epigenetic regulations and deciphering their underlying molecular mechanisms in normal developmental processes (e.g., hematopoiesis) and tumorigenesis (e.g., leukemogenesis). The long-term goal of the laboratory is to translate this knowledge into the development of effective novel therapeutic strategies to treat cancers in the clinic, especially those that are resistant to currently available therapies.

FY2016 research highlights

Acute myeloid leukemia (AML) is a dismal disease. Seventy percent of AML patients do not survive over five years with currently available therapeutics. My lab has contributed substantially to a better understanding of the genetic and epigenetic molecular mechanism(s) underlying the development/maintenance and drug resistance of AML. Moreover, through collaboration with other investigators, we have developed nanoparticles carrying tumor-suppressor microRNA oligos to treat AML and demonstrated the high efficacy and selectivity of our therapeutic strategies.

Most significant FY2016 publication

Jiang X, Hu C, Arnovitz S, Bugno J, Yu M, Zuo Z, Chen P, Huang H, Ulrich B, Gurbuxani S, Weng H, Strong J, Wang Y, Li Y, Salat J, Li S, Elkahloun AG, Yang Y, Neilly MB, Larson RA, Le Beau MM, Herold T, Bohlander SK, Liu PP, Zhang J, Li Z,

He C, Jin J, Hong S, Chen J. miR-22 has a potent anti-tumor role with therapeutic potential in acute myeloid leukemia. *Nature Communications*. 2016, 7:11452.

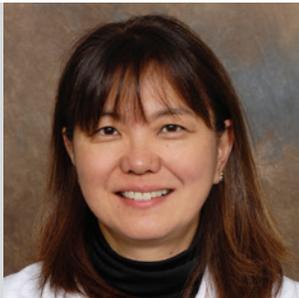
What is the potential impact of this work?

We discovered a previously unappreciated signaling pathway involving the TET1/EZH2/SIN3A-miR-22-CREB-MYC signaling circuit in de novo AML, in which miR-22 functions as a pivotal tumor-suppressor gatekeeper, distinct from its oncogenic role reported in other types of cancers. Thus, our studies provide new insights into the understanding of the molecular mechanism of AML, as well as the genetic/epigenetic differences between AML and other cancers. Furthermore, our proof-of-concept studies with the miR-22-carrying nanoparticles to treat AML in preclinical animal models highlight the possibility of employing miR-22-based therapy to treat AML patients in the clinic in the near future.

What does 2017 hold for your research?

We will continue to focus on our DNA demethylation and mRNA methylation/demethylation research projects to provide a deep understanding of the biological functions and underlying molecular mechanisms of DNA/RNA epigenetic regulations in fundamental bioprocesses, especially in cancer biology.

DERMATOLOGY



Ana Luisa Kadekaro, PhD

Assistant Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **4**

New awards — **1**

Total research holdings — **\$908,827**

Departmental publications — **18[^]**

Research fellows — **0**

PRIMARY RESEARCH FOCUS

The fundamental responses of the skin to environmental challenges such as solar ultraviolet radiation with particular interest on the mechanisms that maintain the skin redox balance.

FY2016 research highlights

In the past year my laboratory tested a new generation of DNA damaging agents with potential for melanoma treatment. This project was a collaborative effort between my laboratory and two other groups, one in the University of Cincinnati Chemistry Department led by Edward Merino, PhD, and the other in the UC Winkle College of Pharmacy spearheaded by Yuhang Zhang, PhD. We explored the potential use of a new generation of smart compounds which are activated in the presence of high levels of reactive oxygen species (ROS). Once activated, the compounds act as a powerful DNA damage agent. Because of the metabolic differences between normal cells and most of the cancer cells, an important therapeutic window is opened for this new agent, which should be more active in melanoma cells without affecting normal cells.

Most significant FY2016 publication

Zhou L, Yang K, Wickett RR, Kadekaro AL, Zhang Y. Targeted deactivation of cancer-associated fibroblasts by b-catenin ablation suppresses melanoma growth. *Tumor Biology*. 2016, 37:14235.

What is the potential impact of this work?

The recent advances in melanoma immunotherapy and targeted therapy represent a great breakthrough; unfortunately, they have not resulted in significant prolonged survival rates for patients with advanced melanoma. The main cause for this shortcoming is the development of drug resistance which is facilitated by genomic instability and the emergence of different sub-populations of cells within the melanoma tumor. Our approach takes advantage of the inherent metabolic changes presented by melanoma cells, regardless of their genetic and/or epigenetic alterations. Our study reveals a potential new therapeutic approach that is more specific to melanoma cells and, therefore, more tolerable to patients.

What does 2017 hold for your research?

We were recently awarded a Department of Defense Idea Award to explore a new paradigm in melanoma prevention. Our hypothesis is that sunscreen alone is insufficient to protect against melanoma formation. We will test a new generation of antioxidants synthesized in Dr. Merino's lab using a strategy designed to prevent the excitation of melanin and, therefore, prevent the formation of "dark CPDs (cyclobutane pyrimidine dimers)." If our hypothesis is correct, individuals will have to use sunscreen during outdoor activities and, importantly, an additional post sun exposure cream for a more efficient melanoma prevention strategy.

EMERGENCY MEDICINE



Michael Lyons, MD

Associate Professor
Medical Director, Early Intervention Program

DEPARTMENT RESEARCH DETAILS

Research faculty — **16**
New awards — **8**
Total research holdings — **\$4,429,231**
Departmental publications — **79[^]**
Research fellows — **1**

PRIMARY RESEARCH FOCUS

Health services innovations to integrate public health and prevention priorities with health care.

FY2016 research highlights

While HIV screening and prevention has been our primary focus, we are expanding our work in other areas, such as Hepatitis C (HCV) and substance abuse. We recently completed a large, multi-center, pragmatic trial comparing different approaches to patient selection for HIV screening in the emergency department (ED). We are also collaborating with David Kelton, PhD, and Craig Froehle, PhD, of the UC Lindner College of Business to build a computer simulation to compare the consequences of different HIV screening strategies on ED operations. Our work in collaboration with Kenneth Sherman, MD, of the UC Department of Internal Medicine, has revealed a surprisingly high prevalence of undiagnosed HCV in our ED. We are collaborating with Theresa Winhusen, PhD, of the UC Department of Psychiatry and Behavioral Neuroscience, on secondary prevention interventions for opioid addiction.

Most significant FY2016 publication

Lyons MS, Kunnathur VA, Rouster SD, Hart KW, Sperling MI, Fichtenbaum CJ, Sherman KE. Prevalence of diagnosed and undiagnosed hepatitis C in a midwestern urban emergency department. *Clin Infect Dis*. 2016; 62(9): 1066-71.

What is the potential impact of this work?

HCV is now widely recognized as a crisis of great importance for human health and health care economics. Diagnosing those unaware of their infection is an essential first step toward treatment and reduced transmission. We found that 11 percent of our ED population is in need of HCV treatment, and most patients are undiagnosed. This suggests that EDs are likely to be uniquely important for HCV screening. Our additional finding that many cases would be missed by current Centers for Disease Control screening recommendations indicates the need for complementary screening strategies applied to an expanded age range.

What does 2017 hold for your research?

We will be completing work on our current projects involving HIV screening and hope to provide important guidance on which screening strategies are most effective with the least disruption of usual ED operations. Our team will also begin implementing HCV screening in the ED. We will be working ever more closely with our collaborators in psychiatry to implement two trials evaluating methods for engaging ED patients with opioid addiction into treatment. Finally, we are developing a program of research focused on the ED role in primary prevention of iatrogenic opioid addiction.

ENVIRONMENTAL HEALTH



Ranjan Deka, PhD

Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **40**

New awards — **20**

Total research holdings — **\$27,991,594**

Departmental publications — **181[^]**

Research fellows — **23**

PRIMARY RESEARCH FOCUS

Identification of genetic and epigenetic-factors associated with common and complex diseases, with emphasis on cardiometabolic disorders.

Cardiovascular diseases and their associated risk factors have emerged as major public health problems. Thorough understanding of the underlying contributory factors — genetic and non-genetic — is imperative to gain insights into disease etiology for diagnosis, prevention and management of such common disorders. My laboratory has been conducting genome-wide association studies to identify genetic variants associated with obesity, metabolic syndrome and related traits.

FY2016 research highlights

My laboratory, in collaboration with researchers at Brown University and University of Pittsburgh, identified a novel genetic variant that strongly influences obesity in humans. This is a protein altering variant in the CREBRF gene on chromosome 5, not yet known as an obvious candidate for obesity.

Most significant FY2016 publication

Minster RL, Hawley NL, Su CT, Sun G, Kershaw EE, Cheng H, Buhule OD, Lin J, Reupena MS, Viali S, Tuitele J, Naseri T, Urban Z, Deka R, Weeks DE, McGarvey ST. A thrifty variant in CREBRF strongly influences body mass index in Samoans. *Nature Genet.* 48(9): 1049-1054.

What is the potential impact of this work?

The CREBRF variant was discovered among the Samoans of Polynesia, who have a very high prevalence of obesity. Its effect on obesity is much higher

than other genetic variants thus far reported in the literature. Functional studies in pre-adipocyte cell lines showed the variant promoting adipogenesis, lipid storage, lower energy utilization and cell survival in starvation. The variant likely provided selective advantage to its carriers during nutritional stresses; however, in the modern obesogenic environment with food abundance, promoted obesity. This research provided new insights into the etiology of obesity supporting the “thrifty” gene hypothesis highlighting new directions in obesity research.

What does 2017 hold for your research?

Both genetic and non-genetic factors influence complex disorders. Genome-wide association studies have uncovered hundreds of genetic variants associated with these disorders. Epigenetic alterations in response to cumulative environmental challenges are now attributed in their etiologies. A more comprehensive approach is exploration of integrative roles of genetic and epigenetic variations in the development of complex diseases. The National Heart, Lung and Blood Institute has awarded a high priority R56 grant (PI: Deka) on an integrated genome-wide and epigenome-wide association study of cardiometabolic traits in a relatively isolated population from the Adriatic coast of Croatia to start in 2017.

FAMILY AND COMMUNITY MEDICINE



Nancy Elder, MD

Professor
Director, Cincinnati Area Research and Improvement Group (CARInG) Practice Based Research Network (PBRN)
Chief Medical Officer, Cincinnati Health Network (a homeless only community health center)

DEPARTMENT RESEARCH DETAILS

Research faculty — **16**
New awards — **9**
Total research holdings — **\$2,610,251**
Departmental publications — **85[^]**
Research fellows — **0**

PRIMARY RESEARCH FOCUS

Research that is performed with and alongside primary care physicians (PCPs) and providers in the community.

This research impacts PCPs and their patients. Our goal is to improve the quality of care and the lives of both patients and providers. Following discussions with PCPs in 2009, we have been focused on researching ways to improve chronic pain (CP) care in the primary care setting. This has always been a difficult clinical area for primary care, and the recent opioid epidemic has focused the attention of the government and the public on the role of opioids in CP. However, our research has gone beyond just opioids to focus on how we can help PCPs better assess and manage chronic pain so that patients have less pain severity, do more of what they want to do and enjoy life more.

FY2016 research highlights

In the past year, we have been disseminating the results of our 2013-2015 study examining different quality improvement techniques to improve primary care pain management. Our ongoing telehealth chronic pain mentoring project for primary care allows PCPs in their offices to connect once a month via the internet to a panel of pain consultants who discuss a real (but de-identified) patient presented by a PCP. Chronic pain is a complex illness best served by an interprofessional team, but insurance, cost, transportation and access often limit patients' (and PCPs') abilities to utilize these services directly. This project puts the interprofessional team at the PCPs' fingertips to find the CP care components most likely to help the patient.

Most significant FY2016 publication

Elder N, Penm M, Pallerla H, Vonder Meulen MB, Short AD, Diers T, et al. Provision of recommended chronic pain assessment and management in primary care: does patient-centered medical home (PCMH) recognition make a difference? *J Am Board Fam Med.* 2016;29(4):474-81.

What is the potential impact of this work?

Our research has direct clinical impact, as we do the research with and in primary care practices. We have demonstrated that PCPs are providing more evidence-based assessments and management of patients with chronic pain and that their confidence and skills in caring for these complex patients are improving.

What does 2017 hold for your research?

We currently have a pending grant application to continue our work to improve CP care in primary care by combining successful elements of in-office QI improvement with telehealth mentoring and expanding to a larger number of regional practices. In addition, I have partnered with UC faculty in psychiatry on another grant application working directly with primary care patients already on chronic opioids to study an online tool to help patients improve pain while decreasing opioid use.

HOXWORTH BLOOD CENTER



Jose Cancelas MD, PhD

Research Division Director & Deputy Director
of Hoxworth Blood Center

DEPARTMENT RESEARCH DETAILS

Research faculty — **6**
New awards — **8**
Total research holdings — **\$3,248,773**
Departmental publications — **54[^]**
Research fellows — **3**

PRIMARY RESEARCH FOCUS

Stem cell and hematotherapy.

FY2016 research highlights

Identification of the cellular mechanisms responsible for mutant ELANE-induced severe congenital neutropenia and targeted therapeutic proof-of-concept in a model of “disease-on-the-dish” which uses induced pluripotent stem cell derived hematopoiesis analysis and CRISPR-mediated gene editing.

Most significant FY2016 publication

Nayak RC, Trump LR, Aronow BJ, Myers K, Mehta P, Kalfa T, Wellendorf AM, Valencia CA, Paddison PJ, Horwitz MS, Grimes HL, Lutzko C, Cancelas JA. Pathogenesis of ELANE-mutant severe neutropenia revealed by induced pluripotent stem cells. *J Clin Invest.* 2015 Aug 3;125(8):3103-16.

What is the potential impact of this work?

Identification of a potential method to treat severe congenital neutropenia reducing the intensity of G-CSF therapy and adding a pharmacological chaperone with high-affinity for neutrophil elastase.

What does 2017 hold for your research?

Ten different manuscripts have been published, accepted or submitted in FY2017. These manuscripts are diverse and include stem cell and leukemic stem cell/progenitor biology as well as determination and validation of novel methods for cryopreservation and pathogen reduction of blood/cell products for therapy. Another three manuscripts are in preparation.

INTERNAL MEDICINE



Frank McCormack, MD

J. Gordon and Helen Hughes Taylor Professor and Director, Division of Pulmonary, Critical Care and Sleep Medicine

DEPARTMENT RESEARCH DETAILS

Research faculty — **124**

New awards — **55**

Total research holdings — **\$32,292,237**

Departmental publications — **388[^]**

Research fellows — **30**

PRIMARY RESEARCH FOCUS

Pulmonary innate immunity and translational studies in rare lung disease, especially those with a genetic basis.

We are currently using a mouse model of pulmonary alveolar microlithiasis (PAM) to plan trials of low phosphate diet and chelation bronchoalveolar lavage in patients with PAM.

FY2016 research highlights

Food & Drug Administration approval of sirolimus for patients with lymphangioleiomyomatosis (LAM), based on a single multicenter, international National Institutes of Health trial led by the University of Cincinnati College of Medicine, and incorporation of sirolimus treatment into the American Thoracic Society Guidelines for LAM (AJRCCM 194:748-61, 2016).

Most significant FY2016 publication

Saito A, Nikolaidis NM, Amlal H, Uehara Y, Gardner JC, LaSance K, Pitstick LB, Bridges JP, Wikenheiser-Brokamp KA, McGraw DW, Woods JC, Sabbagh Y, Schiavi SC, Altinişik G, Jakopović M, Inoue Y, McCormack FX. Modeling pulmonary alveolar microlithiasis by epithelial deletion of the Npt2b sodium phosphate cotransporter reveals putative biomarkers and strategies for treatment. *Sci Transl Med.* 2015 Nov 11 (313).

What is the potential impact of this work?

Our hope is that by taking advantage of the eminently decipherable monogenic nature of rare lung diseases and conducting our research in a purpose-driven, goal-oriented manner, we can find effective treatments for the same patients who so courageously donate their time and tissues for our trials.

What does 2017 hold for your research?

We are launching a multicenter NIH trial of early, low-dose sirolimus in asymptomatic patients with lymphangioleiomyomatosis to determine if early, prophylactic intervention can prevent progression to more advanced stages of the disease. We will be preparing for human trials in pulmonary alveolar microlithiasis through the Rare Lung Disease Consortium. Finally, our recent finding that the proliferative state of alveolar type II cells determines their susceptibility to infection with influenza suggests paradigm shifting approaches to assignment of host risk, and prevention and treatment of influenza pneumonia. We will be developing these ideas in preclinical models, in preparation for clinical trials in the future.

MEDICAL EDUCATION



Amy Bunger, PhD

Assistant Professor
Assistant Designated Institutional Officer

DEPARTMENT RESEARCH DETAILS

Research faculty — **0**
New awards — **0**
Total research holdings — **\$11,000**
Departmental publications — **5^**
Research fellows — **0**

PRIMARY RESEARCH FOCUS

Patient safety, simulation, assessment and quality improvement.

FY2016 research highlights

Through our research protocol BRACK (Baseline Resident Assessment of Clinical Knowledge), which assesses all incoming residents prior to the start of service, Paul Wojciechowski, MD, of the UC Department of Anesthesiology, and I now have the first large scale data set recording clinical and cognitive performance of residents for whom we have a baseline performance on both the Accreditation Council for Graduate Medical Education competencies and the Entrustable Professional Activities required of medical school graduates, through to graduation and ACGME milestone assessment. This allows us the ability to determine the predictive power, which thus far we know to correlate to performance issues, up to and including termination.

Most significant FY2016 publication

Patterson MD, Militello LG, Bunger A, Taylor RG, Wheeler DS, Klein G, Geis GL. Leveraging the critical decision method to develop simulation-based training for early recognition of sepsis. *Journal of Cognitive Engineering and Decision Making*. 10(1), 36–56.

What is the potential impact of this work?

This represents the end of our three-year Agency for Healthcare Research and Quality grant employing the critical decision method used by many high reliability organizations to identify specific cues that allow the early detection of sepsis. Sepsis remains a critical, worldwide public health problem, and current trainees now have the restriction on work hours and the absence of closed loop learning that seeing a case from beginning to end allows. Thus, many have exposure to both fewer cases of sepsis, as well as the outcomes or missed recognition of sepsis. Our replication of cases in a simulated environment will help with increasing this recognition.

What does 2017 hold for your research?

In 2017 we are holding an ACGME workshop about the conceptualization and structure of BRACK to help disseminate this methodology and construct for application in other GME programs across the country. We will also be sharing our data as a performance indicator for medical schools regarding the assessment of their graduates prior to the start of clinical service.

MOLECULAR AND CELLULAR PHYSIOLOGY



Yana Zavros, PhD

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **10**

New awards — **5**

Total research holdings — **\$5,677,826**

Departmental publications — **40[^]**

Research fellows — **7**

PRIMARY RESEARCH FOCUS

Using novel culture systems to study gastric epithelial regeneration and disease.

Two of my major research areas include: 1) studying the mechanistic interaction between *Helicobacter pylori* and the host gastric epithelium and the development of gastric cancer, and 2) examining the role of Hedgehog signaling as a regulator of the immune response during gastric regeneration and repair in response to injury.

FY2016 research highlights

A highlight was having my R01 renewed. The objectives of this proposal are to develop an understanding for the process of gastric regeneration, and to then identify the mechanism by which the basic aging process of the stomach leads to an epithelium incapable of repair in response to injury. In addition, I have the opportunity to be part of a research collaboration led by UC colleagues Alison Weiss, PhD, and Jim Wells, PhD. I am project leader for an investigation of *H. pylori*-host interactions that trigger the disruption of epithelial cell differentiation using three-dimensional human gastric organoids generated through the directed differentiation of human pluripotent stem cells.

Most significant FY2016 publication

Bertaux-Skeirik N, Feng R, Schumacher MA, Mahe MM, Engevik AC, Peek Jr RM, Ottemann K, Orian-Rousseau V, Boivin GP, Helmrath MA and Zavros Y. CD44 plays a functional role in *H. pylori*-induced epithelial cell proliferation. *PLOS Pathogens*, 11(2):e1004663, 2015.

What is the potential impact of this work?

This publication demonstrates that in response to *Helicobacter pylori* infection there is activation of cell adhesion protein CD44 (also known as a gastric cancer stem cell marker). CD44 mediates epithelial hyperproliferation during infection and thus may explain a key mechanism of bacterial pathogenesis and the development of gastric cancer that is triggered by *H. pylori*.

What does 2017 hold for your research?

Our future goals are to: 1) use *in vitro* and *in vivo* organoid-based approaches for the study of the interaction between cancer cells and the immune microenvironment, 2) develop a preclinical organoid-based platform for anticancer drug evaluation, and 3) use *in vitro* and *in vivo* preclinical models that will allow us to effectively evaluate novel cancer therapeutics as well as to identify predictive biomarkers for gastric cancer. The acquisition of such knowledge is the first step in a continuum of research required to develop an *in vivo* and *in vitro* patient-derived organoid-based platform for personalized medicine that will then be translated to phase I clinical trials.

MOLECULAR GENETICS, BIOCHEMISTRY AND MICROBIOLOGY



Daniel Hassett, PhD

Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **14**

New awards — **4**

Total research holdings — **\$5,648,510**

Departmental publications — **38[^]**

Research fellows — **6**

PRIMARY RESEARCH FOCUS

Novel treatment approaches for antibiotic-resistant “super-bug” bacteria that represent a monumental global health problem.

As a culmination of many years of basic and anti-bacterial research, I have identified an innovative, new chemical tandem called AB569 (acidified nitrite, pH 6.5 [A-NO₂] and EDTA, patent pending) that kills all Gram-negative and Gram-positive bacteria tested to date with no acquired resistance observed. AB569 represents rapid “benchtop-to-bedside” science.

FY2016 research highlights

My lab and the University of Cincinnati have licensed AB569 to Arch Biopartners of Toronto and acquired Food and Drug Administration and European Medicines Agency Orphan Drug Approval in less than five months to initiate clinical trials in cystic fibrosis (CF) patients with chronic *Pseudomonas aeruginosa* infections. The team also has a manufacturer (Catalent) that has generated GMP grade NaNO₂ and EDTA, a medical clinical trial guidance team and CF clinical trials physicians at both Cincinnati Children’s Hospital Medical Center (J.P. Clancy, MD) and UC (Patricia Joseph, MD). My efforts were recently recognized with UC’s Emerging Entrepreneur Award for 2016. It is anticipated that this chemical tandem can be applied to the treatment of myriad important pathogens.

Most significant FY2016 publication

McDaniel, C, Su S, Panmanee W, Lau GW, Browne T, Cox K, Paul AT, Ko SB, Mortensen JE, Lam JS, Muruve DA, and Hassett DJ. A putative ABC transporter permease is necessary for resistance to acidified nitrite and EDTA in *Pseudomonas aeruginosa* under aerobic and anaerobic planktonic and biofilm conditions. *Front. Microbiol.* 2016 April 1,7:291.

What is the potential impact of this work?

I can envision two potential outcomes: 1) a new bactericidal drug to treat lung and urinary tract infections in millions of patients worldwide; and 2) the potential to solve the problem of antibiotic resistant infections in the lungs and urinary tract.

What does 2017 hold for your research?

I will publish the results of these studies in a major journal. Significantly, it is my deepest hope that successful outcomes from the human trials will lead to new drug approval applications with the FDA and EMA, respectively. My lab also will continue down this avenue of research. Recent RNA_{seq} studies infer a global inactivation of a number of essential metabolic pathways that are shared by most bacteria. We intend to validate these studies as a means to clinical implementation of this treatment.

NEUROLOGY AND REHABILITATION MEDICINE



Alberto Espay, MD

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **32**

New awards — **7**

Total research holdings — **\$19,799,642**

Departmental publications — **211[^]**

Research fellows — **1**

PRIMARY RESEARCH FOCUS

The phenomenology and treatment of Parkinson's disease and in the understanding of functional (psychogenic) movement disorders.

FY2016 research highlights

This research builds the rationale to break from the conventional boundaries that limit the success of neuroprotective therapies in Parkinson's disease. Parkinson's has been assumed to represent a single disease, which has been adequate for the application of symptomatic (dopaminergic) therapies, but inadequate for the implementation of disease-modifying interventions. We are building momentum to facilitate the large conceptual shift needed to succeed in slowing Parkinson's.

Most significant FY2016 publication

Espay AJ, LeWitt PA, Hauser RA, Merola A, Masellis M, Lang AE. Neurogenic orthostatic hypotension and supine hypertension in Parkinson's disease and related synucleinopathies: prioritization of treatment targets. *Lancet Neurol.* 2016 Aug;15(9):954-966.

What is the potential impact of this work?

Patients who have a common complication, orthostatic hypotension (a drop in blood pressure when standing), may be shortchanged if they are undertreated by virtue of the risk of supine hypertension (an increase in blood pressure when sitting and lying). The short-term risks and complications of undertreating the former outweigh the long-term risks of allowing some of the latter. The corresponding change in practice may have large effects on quality of life in those living with Parkinson's disease.

What does 2017 hold for your research?

The establishment of a large network of Parkinson's centers, based on the Parkinson Study Group with UC Gardner Center for Parkinson's Disease and Movement Disorders leadership, aimed at developing the infrastructure to develop biomarkers that will drive a more nuanced, biologically specific approach to Parkinson's disease and usher precision medicine in neurodegenerative diseases.

NEUROSURGERY



Jed Hartings, PhD

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **3**

New awards — **4**

Total research holdings — **\$1,180,758**

Departmental publications — **63[^]**

Research fellows — **3**

PRIMARY RESEARCH FOCUS

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.

FY2016 research highlights

A highlight of our research was the demonstration that spreading depolarizations are significantly associated with excitotoxicity in patients with severe traumatic brain injury. This study clinically validated results from a rodent stroke model, where we found that excitatory neurotransmission is elevated only as a consequence of spreading depolarizations. Collectively, these results suggest spreading depolarizations as a more specific pathologic mechanism and potential therapeutic target in acute brain injury.

Most significant FY2016 publication

Hinzman JM, Wilson JA, Mazzeo AT, Bullock MR, Hartings JA. Excitotoxicity and metabolic crisis are associated with spreading depolarizations in severe traumatic brain injury patients. *J Neurotrauma*. 2016 Mar 18.

What is the potential impact of this work?

Our results imply re-interpretation and re-design of the many failed clinical trials of NMDA receptor antagonists in brain trauma and stroke since the 1980s. In these trials, all patients were administered trial drug. Since NMDA antagonists block spreading depolarizations, our results suggest that only the subset of patients with spreading depolarizations (approximately 50 percent) may have received benefit from treatment. Such effect might be detected in future trials by more selective patient enrollment enabled by spreading depolarization monitoring.

What does 2017 hold for your research?

A new effort will be to model and understand brain lesions that develop in the early (less than 72 hours) course following aneurysmal subarachnoid hemorrhage. Preliminary results in a swine model suggest that subarachnoid blood clots only cause brain lesions when spreading depolarizations occur. We aim to determine the causal role of depolarizations in the development of cortical ischemia and infarction and decipher what aspects of blood clots trigger the pathologic cascade.

OBSTETRICS & GYNECOLOGY



Emily DeFranco, DO

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **5**

New awards — **1**

Total research holdings — **\$2,765,249**

Departmental publications — **67[^]**

Research fellows — **0**

PRIMARY RESEARCH FOCUS

Through collaboration with the March of Dimes Prematurity Research Center Ohio Collaborative, we execute a transdisciplinary and cross-institutional approach to studying the causes of preterm birth.

My research focuses primarily on prevention of preterm birth in high-risk women with short cervix and prior preterm birth through clinical trials. I also perform observational epidemiologic studies aimed to identify other subgroups of women at particularly high risk of preterm delivery. I have published numerous studies focusing on these populations. I am actively involved in multiple clinical trials and epidemiologic studies. In addition to preterm birth, I collaborate on transdisciplinary and multicenter clinical trials and epidemiologic studies in the area of general obstetrics and perinatal outcome. Some of my additional research interests include infant mortality, air pollution influences on pregnancy complications, genetics of birth timing, racial differences in perinatal outcomes, birth spacing and markers of fetal maturation. I am actively involved in mentoring undergraduate students, medical students, resident physicians and subspecialty fellows in their acquisition of knowledge of hypothesis generation, study design and application of clinical research.

FY2016 research highlights

The highlight of my research in 2016 was the initiation of the ADORE (Assessment of DHA on Reducing Early Pre-term Birth) clinical trial, which is a large multicenter clinical trial taking place at the University of Cincinnati, Ohio State University and the University of Kansas Medical Center. This is a five-year, \$3 million phase III clinical trial for preterm birth prevention which aims to enroll approximately 1,000 pregnant women.

Most significant FY2016 publication

DeFranco EA, Hall ES, Muglia LJ. Racial disparity in preivable birth. *Am J Obstet Gynecol.* 2016 Mar;214(3):394.e1-7.

What is the potential impact of this work?

The ADORE trial has the potential to have significant impact on reduction of preterm birth in the U.S. If efficacy of DHA for preterm birth prevention is identified, all pregnant women could potentially benefit.

What does 2017 hold for your research?

In 2017, we will continue to enroll women in the ADORE clinical trial. In addition, we have plans to initiate and continue enrollment in over 10 other clinical trials through the Division of Maternal-Fetal Medicine at the University of Cincinnati.

OPHTHALMOLOGY



Zélia Corrêa, MD, PhD

Professor of Clinical Ophthalmology,
Mary Knight Asbury Chair of Ophthalmic
Pathology and Ocular Oncology,
Director of Ocular Oncology and Diagnostic
Ultrasonography Services

DEPARTMENT RESEARCH DETAILS

Research faculty — **4**
New awards — **1**
Total research holdings — **\$1,697,064**
Departmental publications — **68[^]**
Research fellows — **3**

PRIMARY RESEARCH FOCUS

Clinical and translational research on uveal melanoma and retinoblastoma, in addition to drug release devices for treatment of intraocular tumors.

FY2016 research highlights

Our center is currently working on the development of a micro-implant for sustained release of hydrophilic drugs (MTX) to treat vitreo-retinal diseases with potential widespread clinical application. The micro-implant is expected to be injected into the eye using a 23G trocar. Preliminary data suggests the PLA/PLGA- and Chitosan-based MTX micro-implant is capable of delivering a sustained therapeutic release of MTX for a period of more than three to five months *in vitro* and one month *in vivo*. Further, the micro-implant constituents have been observed to be non-toxic in rabbit eyes.

Most significant FY2016 publication

Corrêa ZM, Augsburger JJ. Independent prognostic significance of gene expression profile class and largest basal diameter of posterior uveal melanomas. *Am J Ophthalmol.* 2016 Feb;162:20-27.

What is the potential impact of this work?

Our group has been employing fine needle aspiration biopsy to sample tumors for diagnostic and prognostic purposes for the past two decades. Such experience has allowed us to test prognostic tests (Gene Expression Profile) and further analyze biopsy yield, different surgical techniques and correlate biopsy results to tumor regression and patient survival. The results related to this ongoing project have led to several peer-reviewed journal publications.

What does 2017 hold for your research?

Our group is going to be part of two multi-center clinical trials evaluating various driver mutations in uveal melanomas, as well as yield and safety of different biopsy approaches, and natural history of metastatic melanoma, as well as different surveillance protocols.

ORTHOPAEDIC SURGERY



Brian Grawe MD

Assistant Professor and Research Director,
Division of Sports Medicine

DEPARTMENT RESEARCH DETAILS

Research faculty — **0**
New awards — **0**
Total research holdings — **\$0**
Departmental publications — **125[^]**
Research fellows — **2**

PRIMARY RESEARCH FOCUS

Developing tissue-engineered repairs for a meniscus injury.

FY2016 research highlights

Our goal is to identify drugs that can be delivered to treat meniscal tissue defects and improve the physiologic healing response by stimulating new growth. This year we completed our first study where we designed a means to deliver a drug that had been shown to cause cartilage development in discs in the back. We tested the drug and delivery method in an animal model and saw new tissue growth in the meniscus at four weeks.

Most significant FY2016 publication

We have not published these early results yet but are using the results to secure funding to look at our drug and delivery system not only at a date later than four weeks but to examine the properties of the repaired tissue for strength and function.

What is the potential impact of this work?

In the past, the standard surgical treatment, for an irreparable meniscus tear has been partial or total meniscectomy due to the low healing potential of the meniscus, secondary to its poor vascularity. However, research has shown that removal of the meniscus can lead to premature osteoarthritis due to the increased stress on the articular cartilage caused by the absence of the meniscus. These findings have led surgeons to attempt to preserve as much meniscal tissue as possible during surgical

intervention. Unfortunately, the majority of the meniscus is an avascular structure and successful repair cannot always be achieved.

Our work addresses meniscal tears that occur in the avascular zone, those that are not typically considered feasible for repair in the clinical setting. Meniscal tears in the avascular zone are difficult to successfully repair due to the inability of the meniscus to heal and remodel. Currently, a tear in this region cannot be repaired reliably well to restore the meniscal integrity present before injury.

In addition, we are developing a method to functionally assess the meniscal tissue utilizing pressure mapping technology to obtain contact pressure maps for the intact menisci. This method will be used to determine mechanical properties of normal meniscal tissue as a baseline for comparison in future studies.

What does 2017 hold for your research?

The next step in our research is to look at the new tissue growth we saw at four weeks to determine if its structure and function is similar to the original meniscal tissue.

OTOLARYNGOLOGY—HEAD AND NECK SURGERY



David Moore, PhD

Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **5**

New awards — **1**

Total research holdings — **\$1,276,655**

Departmental publications — **177[^]**

Research fellows — **0**

PRIMARY RESEARCH FOCUS

Listening difficulties in children.

FY2016 research highlights

Children with listening difficulties may report at one of several care services where they are often found to have normal hearing, defined as sensitive tone detection. Some of these children will receive one or more diagnoses of learning difficulties, including language impairment, dyslexia and attention deficit disorder. In audiology clinics the children may receive further evaluation for auditory processing disorder (APD). APD is a controversial area due to lack of rigorous evidence for any specific auditory problem. Using the most recent sensitive measures of ear and brain function, we have found objective evidence of sub-clinical hearing loss underlying listening difficulties in children. Our research was funded at the beginning of this year until 2020 with an R01 grant from the National Institutes of Health.

Most significant FY2016 publication

Brewer CC, Zalewski CK, King KA, Zobay O, Riley A, Ferguson MA, Bird JE, McCabe MM, Hood LJ, Drayna D, Griffith AJ, Morell RJ, Friedman TB, Moore DR. Heritability of non-speech auditory processing skills. *European Journal of Human Genetics*, 2016;24(8):1137-44.

What is the potential impact of this work?

It has been suggested for more than 50 years that subtle hearing impairment may contribute to a variety of learning difficulties in children. We have discovered biological mechanisms in the ear and brain that could provide this missing link. The next stage of our research is to substantiate these findings and work collaboratively toward a treatment.

What does 2017 hold for your research?

Working with the Division of Audiology at Cincinnati Children's Hospital Medical Center, we are developing a new Auditory Neurodevelopment Clinic based on our own and other recent evidence in this field, together with the great experience of our clinical colleagues.

PATHOLOGY AND LABORATORY MEDICINE



Laura Woollett, PhD

Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **23**

New awards — **7**

Total research holdings — **\$10,105,124**

Departmental publications — **207[^]**

Research fellows — **19**

PRIMARY RESEARCH FOCUS

Improve pregnancy outcomes that will benefit the infant as well as the mother.

Two major adverse pregnancy outcomes are low birthweight and preterm infants. We are looking for novel biomarkers to determine which mothers are at risk to have preterm or low birthweight infants in an attempt to intervene and improve outcomes. Worldwide, 15 percent of infants are born with low birthweight and 11 percent are born preterm. While the rates of adverse outcomes are highest in resource-poor settings, they also occur in some U.S. cities, including Cincinnati. In the mother, we are examining the mechanisms that lead to long-term neuronal changes after one or several pregnancies.

FY2016 research highlights

We found that women in The Gambia with lower HDL-C levels in early pregnancy had newborns with lower birthweights and shorter gestational lengths compared to women with higher HDL-C levels. We found that mice with low HDL-C levels also had smaller fetuses, due at least partly to reduced transport of nutrients across the placenta.

Most significant FY2016 publication

Woollett LA and Heubi JA. Fetal and neonatal cholesterol metabolism. [Updated 2016 Jun 22]. In: De Groot LJ, Chrousos G, Dungan K, et al., editors. South Dartmouth (MA): MDText.com, Inc.; 2000-.

What is the potential impact of this work?

We hope to define novel biomarkers for women at risk for having small newborns or preterm births in order to improve outcomes and reduce neonatal mortality. While this is especially needed in settings where medical assistance is poor, as occurs in resource-poor countries, it is applicable to all areas with high incidence of preterm birth or small birthweight newborns.

What does 2017 hold for your research?

We hope to identify a biomarker for increased risk of adverse pregnancy outcomes (preterm birth and low birthweight infants) in women in The Gambia, with a focus on various aspects of HDL particles. We would like to continue working with the Bill & Melinda Gates Foundation and test biomarkers we have identified for adverse pregnancy outcomes in additional areas with high incidence of preterm birth and/or small newborns, such as in Cincinnati.

PEDIATRICS



Michael Jordan, MD

Associate Professor

DEPARTMENT RESEARCH DETAILS*

Research faculty — **951**

New awards — **2**

Total research holdings — **\$207,241,486[^]**

Departmental publications — **2,360**

Research fellows — **181**

PRIMARY RESEARCH FOCUS

Immune regulatory disorders.

Immune regulatory disorders are typically quite rare and are caused by inborn genetic defects which affect critical switching mechanisms in the immune system. These disorders have already taught us critically important things about how the human immune system functions and I anticipate that new insights from these disorders will lead to the development of new drugs to treat affected patients and new approaches for treating more common conditions such as autoimmunity and cancer.

FY2016 research highlights

In collaboration with colleagues at the National Institutes of Health and other institutions, we found that a newly identified immune regulatory disorder, caused by deficiency of a protein called LRBA, leads to the loss of a well-known immune checkpoint protein, called CTLA4, in immune cells in these patients. Fortunately, a form of CTLA4 is available as a drug, called abatacept, which when given to these patients led to dramatic improvements in their condition. We were able to map the interactions underlying this complex biology, thereby explaining how this disease develops and how it may be treated.

Most significant FY2016 publication

Lo B, Zhang K, Lu W, Zheng L, Zhang Q, Kanellopoulou C, Zhang Y, Liu Z, Fritz JM, Marsh R, Husami A, Kissell D, Nortman S, Chaturvedi V, Haines H, Young LR, Mo J, Filipovich AH, Blessing JJ, Mustillo P, Stephens M, Rueda CM, Choungnet CA, Hoebe K, McElwee J, Hughes JD, Karakoc-Aydiner E, Matthews HF, Price S, Su HC, Rao VK, Lenardo MJ, Jordan MB. Patients with LRBA deficiency show CTLA4 loss and immune dysregulation responsive to abatacept therapy. *Science*. 2015 Jul 24;349(6246):436-40.

What is the potential impact of this work?

Our findings are the basis for understanding how LRBA deficiency leads to disease in affected patients. It has also pointed to a targeted therapy for this disease. Finally, it has suggested new strategies for turning immune responses up or down in the setting of cancer or autoimmunity.

What does 2017 hold for your research?

We are working to develop a deeper understanding of the structural basis for LRBA:CTLA4 interactions. Such an understanding could guide drug development targeting this pathway. We are also working to develop a clinical trial testing abatacept therapy in patients with LRBA deficiency.

*Data provided by Cincinnati Children's Hospital Medical Center.

[^]Funds flow through Cincinnati Children's Hospital Medical Center.

PHARMACOLOGY AND CELL BIOPHYSICS



Evangelia (Litsa) Kranias, PhD

Hanna Professor and Director, Cardiovascular Biology
Distinguished University Research Professor
Co-Director, Cardiovascular Center of Excellence

DEPARTMENT RESEARCH DETAILS

Research faculty — **14**
New awards — **1**
Total research holdings — **\$7,542,770**
Departmental publications — **27[^]**
Research fellows — **7**

PRIMARY RESEARCH FOCUS

To elucidate the regulatory mechanisms and signaling pathways underlying calcium homeostasis in cardiac physiology and pathophysiology with special emphasis in heart failure and arrhythmias.

We have elucidated the functional significance of Ca-handling in the deteriorated function of human failing hearts. We have also identified human mutations in calcium cycling genes and showed that these may predispose to arrhythmias and heart failure.

FY2016 research highlights

A highlight of our research efforts is the identification of new mechanisms that regulate the activity of inhibitor-1 of protein phosphatase 1. This is a small endogenous protein in the heart that plays a key role in the heart's pumping action and it appears to be a potential therapeutic target for heart failure. Our preclinical studies have yielded promising results along these lines. We identified a miRNA that controls the levels and activity of inhibitor-1, providing additional insights into the regulation of this important molecule. In addition, we identified a human mutation in inhibitor-1 that alters its function and, when mimicked in mouse models, it caused cardiac arrhythmias.

Most significant FY2016 publication

Lam CK, Zhao W, Liu G-S, Cai W-F, Gardner G, Adly G, Kranias E. G 20150101 HAX-1 regulates cyclophilin-D levels and mitochondria permeability transition pore in the heart. Proceedings of the National Academy of Sciences: 112(47) E6466-75, 2015.

What is the potential impact of this work?

In this study, we reported that the hematopoietic-substrate-1 associated protein X-1 (HAX-1) is an inhibitor of the pore and promotes cell survival. HAX-1 works through recruitment of a chaperone protein called Hsp90 from cyclophilin-D, a major component of the pore. Displacement of Hsp90 from cyclophilin-D promotes cyclophilin-D degradation, resulting in inhibition of pore opening and cell death. Thus, HAX-1 and Hsp90, which are ubiquitously expressed, serve as common nodal points in both apoptotic and necrotic cell death. Given that the opening of the mitochondrial permeability transition pore contributes to various diseases, our findings on the HAX-1/Hsp90 complex as a potential therapeutic target have broader applications reaching beyond the heart.

What does 2017 hold for your research?

Our work has contributed a great deal to the understanding of the sarcoplasmic reticulum mechanisms that get impaired in heart failure. We have discovered a multimeric protein complex or "regulatome" that fine-tunes Ca-handling and heart function. Recently, we uncovered two new partners in this ensemble, which mediate a cross-talk between cardiac contractility and cell survival. Our aim is to elucidate the role of these additional players in the heart with emphasis in failure as well as apoptosis and cell death.

PSYCHIATRY AND BEHAVIORAL NEUROSCIENCE



Robert McNamara, PhD

Professor
Director, Lipidomics Research Program

DEPARTMENT RESEARCH DETAILS

Research faculty — **70**
New awards — **19**
Total research holdings — **\$29,880,957**
Departmental publications — **96^**
Research fellows — **11**

PRIMARY RESEARCH FOCUS

Understanding the role of dietary essential fatty acids, including omega-3 fatty acids, in the pathophysiology and treatment of neuropsychiatric disorders.

FY2016 research highlights

In 2016 we demonstrated for the first time that youth with or at high risk for developing bipolar disorder exhibit robust blood omega-3 fatty acid deficits. In a separate study of healthy children, we also demonstrated that blood omega-3 fatty acid levels were positively associated with functional connectivity in cortical networks repeatedly found to be impaired in bipolar disorder. These findings add to a growing body of translational evidence implicating omega-3 fatty acid deficiency as a modifiable neurodevelopmental risk factor for psychiatric disorders including bipolar disorder.

Most significant FY2016 publication

McNamara RK, Jandacek RJ, Tso P, Blom TJ, Welge JA, Strawn JR, Adler CM, Strakowski SM, DelBello MP. Adolescents with or at ultra-high risk for bipolar disorder exhibit erythrocyte docosahexaenoic and eicosapentaenoic acid deficits: A candidate prodromal risk biomarker. *Early Interv Psychiatry*. 2016;10:203-211.

What is the potential impact of this work?

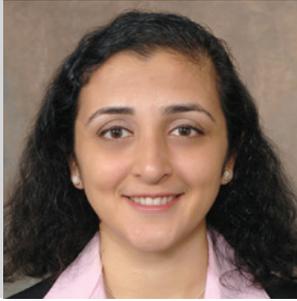
These results indicate that low blood omega-3 fatty acid levels coincide with and likely precede

the initial onset of mania, and are also exhibited by youth at elevated risk for developing bipolar disorder. These data suggest that low omega-3 fatty acid levels may serve as a prodromal risk biomarker to identify youth who are at increased risk for developing bipolar disorder.

What does 2017 hold for your research?

I am conducting two clinical trials and a preclinical imaging study. The first clinical trial is investigating whether adjunctive omega-3 fatty acid treatment can mitigate the adverse cardiometabolic side-effects of second-generation antipsychotic medications in bipolar youth. The second trial is investigating, in part, whether low omega-3 fatty acid biostatus is associated with increased risk for abnormal brain changes in response to psychostimulant treatment in youth with ADHD and at high risk for developing bipolar disorder. The preclinical imaging study is investigating whether dietary-induced omega-3 fatty acid deficiency during perinatal development increases vulnerability to neuropathology in response to psychostimulant treatment in rats.

RADIATION ONCOLOGY



Vinita Takiar, MD, PhD

Assistant Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **7**

New awards — **0**

Total research holdings — **\$0**

Departmental publications — **11[^]**

Research fellows — **1**

PRIMARY RESEARCH FOCUS

Clinical outcomes and mechanisms of resistance to radiation therapy in head and neck cancer.

FY2016 research highlights

On the clinical side, we received an internal award to improve the process for obtaining consent to treat with radiation therapy for head and neck cancer patients. Most laboratory efforts have gone toward large-scale efforts to identify mechanisms of resistance to both radiation therapy and immunotherapy in head and neck cancers in collaboration with Trisha Wise-Draper, MD, PhD, in the UC Department of Internal Medicine.

Most significant FY2016 publication

Takiar V, Garden AS, Ma D, Morrison WH, Edson M, Zafereo ME, Gunn GB, Fuller CD, Beadle B, Frank SJ, William WN Jr, Kies M, El-Naggar AK, Weber R, Rosenthal DI, Phan J. Reirradiation of head and neck cancers with intensity modulated radiation therapy: outcomes and analyses. *Int J Radiat Oncol Biol Phys.* 2016 Jul 15;95(4):1117-31.

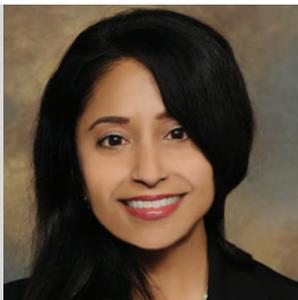
What is the potential impact of this work?

This work represents the single largest series published to date of patients who received reirradiation for the treatment of head and neck cancer with modern-day radiation technology. Not only are clinical outcomes detailed, but toxicity outcomes (a much larger concern in the reirradiation setting) are explicitly discussed to guide other physicians in the complex decision-making process that must occur when a patient with head and neck cancer recurs within a previous irradiated area.

What does 2017 hold for your research?

We will continue to delve into molecular pathways that may help us better understand why some patients respond better to cancer treatments than others. We also anticipate using tissue microarrays to identify novel biomarkers that correlate with clinical outcomes for head and neck cancer patients.

RADIOLOGY



Sadhna Verma, MD

Associate Professor

DEPARTMENT RESEARCH DETAILS

Research faculty — **2**

New awards — **0**

Total research holdings — **\$3,914**

Departmental publications — **68[^]**

Research fellows — **0**

PRIMARY RESEARCH FOCUS

Prostate cancer imaging.

I am actively involved in multidisciplinary collaborations with the UC Department of Radiation Oncology, Divisions of Urology and Hematology/Oncology and the Center for Environmental Genetics.

FY2016 research highlights

We received Mischell Family Prostate Cancer grant funding to support the research project “Gadoxetate Sodium Enhanced Magnetic Resonance Imaging (MRI) as a Biomarker for Aggressive Prostate Cancer” and Textural Analysis: A Novel Oncologic Imaging Biomarker grant funding to evaluate transition zone prostate cancer.

While screening for elevated levels of prostate-specific antigen (PSA) has dramatically improved early detection of prostate cancer, it is still the second-leading cause of cancer death in men. There is a substantial proportion of patients who develop an incurable disseminated disease after local therapy, even if the primary lesion appears localized to the prostate gland when first diagnosed. Both studies address the challenge to develop technology to identify aggressive prostate cancer, with a focus on novel magnetic resonance imaging methods.

Most significant FY2016 publication

Verma S, Sarkar S, Young J, Venkataraman R, Yang X, Bhavsar A, Patil N, Donovan J, Gaitonde K. Evaluation of the impact of computed high b-value diffusion-weighted imaging on prostate cancer detection. *Abdom Radiol.* 2016 May;41(5):934-45.

What is the potential impact of this work?

Diffusion weighted imaging (DWI), a functional MRI sequence, plays a dominant role in prostate cancer detection and localization. High b-value DWI has recently been shown to have greater discriminative ability in identifying prostate cancer. However, acquiring high b value images during a prostate MRI exam prolongs scan time, increases patient discomfort and image artifacts. This study demonstrates that computed high b-value DWI can provide better image quality, lesion conspicuity and increased lesion-to-background contrast ratio than high b-value DWI directly acquired from the scanner. This potentially helps by providing comparable sensitivity and specificity for detecting clinically significant prostate cancer as acquired high b-value DWI without the increased scan times and image degradation artifacts.

What does 2017 hold for your research?

Our goal is to evaluate the genetic component of aggressive prostate cancers through magnetic resonance imaging biomarkers.

SURGERY



Timothy Pritts, MD, PhD

Professor of Surgery
Director, Division of General Surgery

DEPARTMENT RESEARCH DETAILS

Research faculty — **34**
New awards — **19**
Total research holdings — **\$15,613,084**
Departmental publications — **242[^]**
Research fellows — **1**

PRIMARY RESEARCH FOCUS

Optimal resuscitation strategies for hemorrhagic shock.

FY2016 research highlights

During 2016 our laboratory continued investigating the mechanism of aging in stored red blood cells and the effect of this process on the recipient after transfusion and resuscitation for hemorrhagic shock. One series of experiments highlighted a novel role for acid sphingomyelinase and ceramide in the development of the red blood cell storage lesion. We also demonstrated that inhibition of this enzyme leads to decreased lung injury after transfusion. Another series of experiments examined the role of red blood cell microparticles, which are shed from erythrocytes during storage, on pulmonary endothelial cells after transfusion. An additional set of experiments has begun to define the development of the red blood cell storage lesion in previously cryopreserved packed red blood cell units.

Most significant FY2016 publication

Hoehn RS, Jernigan PL, Japtok L, Chang AL, Midura EF, Caldwell CC, Kleuser B, Lentsch AB, Edwards MJ, Gulbins E, Pritts TA. Acid sphingomyelinase inhibition in stored erythrocytes reduces transfusion-associated lung inflammation. *Ann Surg.* 2016 Jan 27.

What is the potential impact of this work?

Blood is essential for the care of trauma patients. There is no substitute for it. Our work suggests that changes that occur during the storage of red blood cell units may impact trauma patients and transfusion recipients on a cellular level during resuscitation. In addition, we have identified potential strategies to improve the quality of previously stored packed red blood cell units that are utilized during trauma resuscitation.

What does 2017 hold for your research?

We plan to focus on the interactions between stored packed red blood cells and endothelial cells. We want to define the molecular pathways by which previously stored erythrocytes may cause potentially harmful effects on endothelial cells. Once we have identified and increased our understanding of these pathways, we would like to modulate these pathways in order to mitigate or attenuate potential harm from previously stored packed red blood cells during resuscitation from hemorrhagic shock.

The background is a solid red color. A white, stylized ribbon graphic is positioned in the upper left quadrant, curving downwards and to the right. The text is centered in the lower half of the page.

RESEARCH AWARDS

FY2016

COLLEGE OF MEDICINE 2016 AWARD RECIPIENTS

The College of Medicine recognizes faculty excellence across a broad spectrum of research activities.

CLINICAL TRIALIST OF THE YEAR

The Clinical Trialist of the Year award was created to acknowledge broad and sustained efforts to bring the most advanced care opportunities to patients through industry-funded clinical trials. The award is made to the investigator with the greatest revenue from industry-funded clinical trials during the year. This year's recipient of the Clinical Trialist of the Year is Gregory Fermann, MD, Department of Emergency Medicine, with FY 2016 revenue of \$826,407.



Gregory Fermann, MD

Gregory Fermann, MD, leads the Emergency Medicine Clinical Trial Center (EM CTC). Emergency medical care is complicated by the high-risk environment, the shortened timelines and a duty to prevent catastrophic health failures from being missed. The decision to treat and release a patient or admit them to the hospital is made using evidence-based algorithms and clinical gestalt. Treatment options are often limited by lack of demonstrated utility in the acute care environment. The EM CTC is a multidisciplinary team of clinical research professionals and investigators committed to screening and enrolling subjects with emergency medical conditions 24 hours a day, 365 days a year. The team investigates diagnostic tests, devices and decision-aids to help in risk stratification and decision-making, as well as testing novel therapies and approaches to patient care. The primary focus is to improve the care of patients who present with signs and symptoms of acute coronary syndrome, acute heart failure, venous thromboembolic disease or hemorrhage associated with anticoagulant use. The EM CTC also conducts trials spanning the full range of conditions seen in the emergency department, from skin and soft tissue infections to asthma. The productivity of the EM CTC is the result of a tireless commitment to research integrity and a culture of teamwork among all of its members.

HEALTH RESEARCH RISING STAR AWARD

The Health Research Rising Star Award recognizes an instructor or assistant professor who demonstrates outstanding research accomplishments and impact at the early career stage. The nominee is well above the career benchmarks expected among peers.

The recipient, Atsuo Sasaki, PhD, Division of Hematology/Oncology, Department of Internal Medicine, Department of Neurosurgery and Department of Cancer Biology, was nominated by Tahir Latif, MD, associate professor and interim chief, Division of Hematology/Oncology.



Atsuo Sasaki, PhD

Atsuo Sasaki, PhD, is pioneering a new field by focusing on an energy molecule, GTP (Guanine triphosphate), and its roles in primary/metastatic brain tumors. With R01 funding, Dr. Sasaki's team has discovered the missing GTP sensor and published their findings in the journal *Molecular Cell*, which has been selected by F1000 members, and featured on multiple media outlets and in both the journal of *Cancer Discovery* and in the journal *Science Signaling*. Dr. Sasaki has published over 50 research papers with more than 6,500 total citations (Hirsch citation H-index of 32). Since joining UC in 2012, Dr. Sasaki has received nine external sources of funding totaling more than \$2.2 million. Among factors for successful research, the Sasaki Lab most appreciates collaborations and has active collaborations with local (two groups), national (four groups) and international researchers (six groups). This multidisciplinary research resulted in multiple awards such as the R01 grant, manuscripts including a publication in *Molecular Cell*, and ground-breaking research that utilizes cutting edge technologies, such as stable isotope labeled metabolomics, NMR and X-ray structural analyses and chemical library screening to identify new inhibitors/activators for the target enzyme. Together, Dr. Sasaki's team is uncovering new regulations of GTP-metabolism, which could lead to novel therapeutics to human disease, such as cancers and metabolic diseases.

RESEARCH SERVICE AWARDS

The Research Service Award recognizes faculty who have committed their time and expertise to improving the quality and rigor of UC College of Medicine research. Award recipients have demonstrated their exceptional service to the College of Medicine.

During this past fiscal year, we honored three faculty members with the Research Service Award. The recipients are: Susan Waltz, PhD, Department of Cancer Biology, nominated by Jun-Lin Guan, PhD; Daniel Woo, MD, Department of Neurology and Rehabilitation Medicine, nominated by Brett Kissela, MD; and Changchun Xie, PhD, Department of Environmental Health, nominated by Shuk-mei Ho, PhD.



Susan Waltz, PhD

Susan Waltz, PhD, has long served as a leader and member of a number of highly impactful research service positions and committees during her time at UC. At the departmental level, she was elected by her faculty peers to serve as the chair of the Department of Cancer Biology ARPT committee. Dr. Waltz also served as the chair of the Department of Cancer Biology Faculty and Staff campaign. She set the foundation for departmental success which has seen contributions rise from around 20 percent to 100 percent participation in three years. Dr. Waltz is a strong advocate for the graduate program in Cancer and Cell Biology. She served as the Director of this program for four years and was pivotal in generating partnerships with cancer center programs at UC and Cincinnati Children's Hospital Medical Center to help secure funding for enhanced student recruitment activities, increased student slots and for program coordinator support. Dr. Waltz currently is a member of the graduate program committee that helps oversee program directives. She is also on many student thesis committees. In the training arena, Dr. Waltz serves as the M-PI on the National Cancer Institute-funded Training Program in Cancer Therapeutics. Dr. Waltz serves as a co-organizer of departmental and joint retreats which have highlighted research contributions of faculty and staff with attendance by about 100 individuals throughout the research community.

On the College/University level, Dr. Waltz has made her presence known. She provides oversight for the Grant Pre-Review Program with the goal of helping make grants from our faculty more competitive. She helped redesign and streamline the program based on the needs expressed by our faculty. She provides important reviewer expertise for our internal grant programs and has served on a number of key committees that have been instrumental in faculty recruitment. Dr. Waltz has served as the interim Director of the Cancer Center and chaired many of the pilot programs during her tenure.



Daniel Woo, MD

Daniel Woo, MD, is vice chair of clinical research and associate director of clinical neuroscience research for the University of Cincinnati Gardner Neuroscience Institute. He is the local PI of the National Institute of Neurological Disorders and Stroke-funded Neuro-NEXT network grant of phase II studies. He has been evaluating and assessing barriers and opportunities for clinical and basic science research throughout the Department of Neurology and Rehabilitation Medicine, creating a research coordinator and recruitment system for the divisions of Multiple Sclerosis and Movement Disorders, managing coordinator efforts, developing Epic electronic medical records screening tools for potential study patients and organizing basic science brainstorming sessions. Dr. Woo represents the UC College of Medicine as an international leader in the area of the genetics of hemorrhagic stroke. He has received six NIH R-01/U-01s in the last eight years. He brings international recognition to the College of Medicine through his work as a founding member and chair of the International Stroke Genetics Consortium, ad hoc reviewer for NINDS NAME Study Section, ad hoc monograph reviewer for the University Health System Consortiums Novation, ad hoc grant reviewer for the American Heart Association, active reviewer on numerous journals, editorial board member of *Stroke*, section editor of *Genetics*, has an extensive list of publications in top medical journals and is a frequent lecturer at grand rounds, symposia and other events throughout the world.

Dr. Woo has made tremendous contributions to the College of Medicine and the university as a whole in the research arena. From 2001 to 2010, he served as director of the Cerebrovascular Ultrasound Laboratory at University Hospital and played a major role as medical director of the Human Subjects Research Post-Approval Monitoring Program from 2004 to 2010. His efforts expanded the program to include additional monitoring and student aid. He has worked closely with the UC Center for Clinical & Translational Science & Training in developing a Redcap registry from the electronic medical record and understanding how to best utilize Epic for research across the Academic Health Center. Other service has included associate director and Career Development Core co-director for the Center for Environmental Genetics, Institutional Review Board member and Faculty Forum Executive Committee member.



Changchun Xie, PhD

Since **Changchun Xie, PhD**, joined the University of Cincinnati from McMaster University in 2012, he has provided statistical support for faculties within and outside the Department of Environmental Health. For example, he has worked with the research group on puberty study of UC's Susan Pinney, PhD, and on Fernald Medical Monitoring Program (FMMP) projects, the research group on Teen-LABS study led by Ralph Buncher, ScD, and Thomas Inge, MD, PhD, and the research group on DNA methylation projects led by Shuk-mei Ho, PhD. He has collaborated with Jonathan Bernstein, MD, and Mark Glazman (General Innovations & Goods, Inc.) on a randomized trial to investigate the effect of the CREON2000A on asthma control in children. He also has a contract with the Division of Hematology/Oncology and has been providing statistical support for this fast-growing division. Primarily through the Center of Biostatistical Services (CBS) and through the UC Center for Clinical & Translational Science & Training, he has provided high-quality biostatistical services across the University of Cincinnati.

Dr. Xie's expertise in biostatistics has been internationally recognized. He is on the editorial board of the American Journal of Theoretical and Applied Statistics, and he is a reviewer for 23 statistical, medical and genetics journals. He was invited by the United Kingdom Medical Research Council to review statistical methodology of research grants and invited six times by the Department of Veterans Affairs Rehabilitation Research and Development service to review Rehabilitation Research scientific proposals. He was also invited by Cambridge University Press to review a biostatistical book proposal written by Steve Selvin, PhD, at the University of California-Berkeley. He organized an invited session — "Innovative Statistical Methods in Clinical Trials" — at the International Chinese Statistical Association Canada Chapter Symposium in Calgary in August 2015. He also presented "Multiple Testing for Correlated Multiple Endpoints in Clinical Trials" at the 71st Annual Deming Conference on Applied Statistics in Atlantic City, NJ, in December 2015.

Dr. Xie sits on the Protocol Review and Monitoring Committee for the Cincinnati Cancer Consortium, the UC Cancer Institute and UC Health. He also sits on the UC Institutional Review Board committee and on multiple Data and Safety Monitoring boards.

Dr. Xie has developed three core courses including: Introduction to Multiple Testing Adjustment, Experimental Design and Applied Survival Analysis. All have excellent evaluation scores, and have become important for the Biostatistics program as well as other graduate programs.

DISTINGUISHED RESEARCH PROFESSOR AND LIFETIME ACHIEVEMENT AWARDS

Recognizing current research success is an important component of our research culture. Equally significant is the recognition of faculty who have received prestigious university awards or have achieved a lifetime career of research success. These faculty have contributed significantly to the scientific landscape and to the success of the College of Medicine. The Distinguished Research Professor and Lifetime Achievement Award series have been instituted to recognize and honor faculty who have achieved this status.

This year's recipients are James Herman, PhD, Department of Psychiatry and Behavioral Neuroscience, and Arnold Schwartz, PhD, MD (hc), D.Sci., Department of Internal Medicine, Division of Cardiovascular Health and Disease.

These awards are given at a special ceremony where the recipient presents a seminar of their highlights and advances in their research area. Dr. Herman was honored on June 23, 2016 and Dr. Schwartz was honored Oct. 27, 2016.

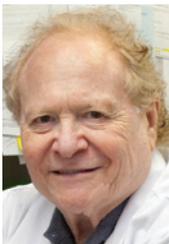
DISTINGUISHED RESEARCH PROFESSOR



James Herman, PhD

James Herman, PhD, Donald C. Harrison professor and vice chair of basic research in the Department of Psychiatry and Behavioral Neuroscience, was recognized by the university with a 2016 Distinguished Research Professor award (STEMM). Dr. Herman is director of the UC Neurobiology Research Center, which manages pilot grant awards to develop research with the potential for large-scale grant funding. Dr. Herman's areas of research focuses on the neurobiology of stress — how the brain processes stressful information — and the physiological actions that may result. His major research interests include structural, functional and molecular biological principles underlying brain stress integration with an emphasis on delineating mechanisms linking stress with mental illness, neurological disorders and metabolic disease.

LIFETIME ACHIEVEMENT AWARD



Arnold Schwartz, PhD

Arnold Schwartz, PhD, was the first to clone and characterize a human heart calcium channel and identify the sites for the calcium channel blocking drugs diltiazem, verapamil and amlodipine, which are widely used to treat heart failure and hypertension. Prior to that, he established the mechanism of action of digitalis, the oldest known drug. Since 1977, Dr. Schwartz, a Distinguished University Professor in the Department of Internal Medicine, has nurtured hundreds of graduate and medical students and young faculty at the UC College of Medicine as the principal investigator of a National Heart, Lung and Blood Institute training grant for 38 years, and a Program Project grant for 28 years. Dr. Schwartz also received the 2012 George Rieveschl Jr. Award for Distinguished Scientific Research from the University of Cincinnati.

LARGEST RESEARCH AWARDS FY2016



James Heubi, MD

Professor and Associate Chair, Department of Pediatrics
Associate Dean for Clinical and Translational Research

James Heubi, MD, received a National Center for Advancing Translational Sciences UL01 award, “Cincinnati Center for Clinical and Translational Sciences and Training.” The award runs from Aug. 14, 2015 to March 31, 2019 with total costs of \$13,445,745. The maturation of the Clinical and Translational Science Award (CTSA) consortium has led to more effective and efficient clinical and translational research across the 62 sites. The University of Cincinnati Center for Clinical and Translational Science and Training (CCTST) has already been successful at fostering clinical and translational research in Cincinnati. The CCTST will develop additional innovative methods to produce high-quality research, share these discoveries and collaborate with other CTSA hubs.

CO-INVESTIGATORS:

Joel Tsevat, MD, Department of Internal Medicine
Brett Kissela, MD, Department of Neurology and Rehabilitation Medicine
Chris Lindsell, PhD, Department of Emergency Medicine
Jack Kues, PhD, Center for Continuous Professional Development



Melissa Delbello, MD

Professor and Chair, Department of Psychiatry and Behavioral Neuroscience

Melissa Delbello, MD, received a Patient-Centered Outcomes Research Institute Award, “MOBILITY: Improving Patient-Centered Outcomes Among Overweight and Obese Youth with Bipolar Spectrum Disorders Treated with Second-Generation Antipsychotics.” The award runs from Sept. 1, 2015 to Nov. 30, 2020 with total costs of \$12,902,926. This research will conduct a pragmatic trial assessing the overall and subgroup-specific effectiveness of metformin and healthy lifestyle interventions versus healthy lifestyle interventions alone on weight and metabolic health in 1,800 overweight or obese youth with bipolar spectrum disorders treated with second-generation antipsychotics (SGA) in community mental health practices. Researchers will assess the comparative effectiveness on SGA adherence and treatment satisfaction, psychiatric symptom burden and overall and weight-related quality of life.

CO-INVESTIGATORS:

Jeffrey Welge, PhD, Department of Psychiatry and Behavioral Neuroscience
Stephen Strakowski, MD, Department of Psychiatry and Behavioral Neuroscience
Luis Patino Duran, MD, Department of Psychiatry and Behavioral Neuroscience



Carol Rice, PhD

Professor Emeritus, Department of Environmental Health

Carol Rice, PhD, received a National Institute of Environmental Health Sciences U45 award, “Hazardous Materials Worker Health and Safety Training.” The award runs from Aug. 1, 2015 to July 31, 2020 with total costs of \$9,991,361. The Midwest Consortium for Hazardous Waste Worker Training proposes to serve the needs of workers and communities potentially exposed to hazardous materials in nine states.



Daniel Woo, MD

Professor and Vice Chair of Clinical Research, Department of Neurology and Rehabilitation Medicine

Matthew Flaherty, MD

Professor, Department of Neurology and Rehabilitation Medicine

Daniel Woo, MD, and **Matthew Flaherty, MD**, received a National Institute of Neurological Disorders and Stroke U01, “Genetic and Environmental Risk Factors for Hemorrhagic Stroke.” The award runs from June 15, 2016 to March 31, 2021 with total costs of \$8,400,787. The findings of this research may have broad-ranging impact on related phenotypes of vascular cognitive impairment, Alzheimer’s disease and ischemic stroke.



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 Aug. 1, 2015 to May 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 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 Tsubulsky, PhD, Department of Pharmacology and Cell Biophysics



Theresa Winhusen, PhD

Professor, Department of Psychiatry and Behavioral Neuroscience
Director of Addiction Sciences Division

Theresa Winhusen, PhD, received a National Institute on Drug Abuse UG1, “Ohio Valley Node-Network (OVNN) of the NIDA Clinical Trials Network.” The award runs from Sept. 15, 2015 to May 31, 2020 with total costs of \$3,786,663. Since its establishment in 2000, the Ohio Valley Node has been one of the most productive of NIDA’s Clinical Trials Network nodes, both in leading and participating in multi-site trials. The wealth of experience and expertise gained over the past 16 years has been used to cultivate collaborations with other research networks to form the Ohio Valley Node-Network. The primary goal of this work is to conduct the research needed to inform clinical practice guidelines for effective substance use disorder prevention and treatment in general medical care settings.

CO-INVESTIGATORS:

Michael Lyons, MD, Department of Emergency Medicine
Nancy Elder, MD, Department of Family and Community Medicine



Melissa Delbello, MD

Professor and Chair, Department of Psychiatry and Behavioral Neuroscience

Robert McNamara, PhD

Professor, Department of Psychiatry and Behavioral Neuroscience

Melissa Delbello, MD, and **Robert McNamara, PhD**, received a National Institute of Mental Health R01, “Neuroimaging Study of Risk Factors for Adolescent Bipolar Disorder.” The award runs from July 8, 2015 to June 30, 2020 with total costs of \$3,230,092. This proposal will use multimodal neuroimaging techniques to prospectively investigate the effects of psychostimulant exposure on pathological brain changes in adolescents with ADHD and a familial risk for developing bipolar disorder.



CO-INVESTIGATORS:

Cal Adler, MD, Department of Psychiatry and Behavioral Neuroscience
Jim Eliassen, PhD, Department of Psychiatry and Behavioral Neuroscience
Richard Komoroski, PhD, Department of Psychiatry and Behavioral Neuroscience
Rodrigo Patino Duran, MD, Department of Psychiatry and Behavioral Neuroscience
Stephen Strakowski, MD, Department of Psychiatry and Behavioral Neuroscience
Jeff Welge, PhD, Department of Psychiatry and Behavioral Neuroscience



Joel Tsevat, MD

Professor, Department of Internal Medicine
Associate Dean for Clinical and Translational Research

Joel Tsevat, MD, received a National Center for Advancing Translational Sciences KL2 Research Scholars Mentored Career Development Award. The award runs from Aug. 14, 2015 to March 31, 2019 with total costs of \$3,220,737. The KL2 program is an opportunity that provides salary support and money for research-related expenses for up to two consecutive years to highly qualified MD, PhD or PharmD junior faculty pursuing careers in clinical and translational research.



Marzieh Salehi, MD

Associate Professor, Department of Internal Medicine, Division of Endocrinology, Diabetes and Metabolism

Marzieh Salehi, MD, received a National Institute of Diabetes and Digestive and Kidney Disease R01, “The Weight-Independent Effects of Bariatric Surgeries on Islet Cell Function.” The award runs from July 1, 2015 to May 31, 2020 with total costs of \$2,930,140. Gastric bypass surgery and sleeve gastrectomy, two commonly performed weight-loss surgeries, improve glucose control in patients with Type 2 diabetes before causing any significant weight loss. This project will study the mechanisms involved in anti-diabetic effect of those surgeries that are independent of weight loss.

CO-INVESTIGATORS:

Mehran Attari, MD, Department of Internal Medicine

Chanchung Xie, PhD, Department of Environmental Health



David Hui, PhD

Professor and Vice Chair of Research, Department of Pathology and Laboratory Medicine
Director of the Metabolic Diseases Institute

David Hui, PhD, received a National Heart, Lung and Blood Institute award, “Cell Type Specific Roles of ApoE2 in Tissue Inflammation and Atherosclerosis.” The award runs from Dec. 1, 2015 to Nov. 30, 2019 with total costs of \$2,633,508. Genetic association studies have identified the epsilon2 allele of the APOE gene with increased risk and severity of peripheral vascular disease and obesity-related diabetes. This research will delineate the mechanism(s) by which the epsilon2 encoded apoE2 protein promotes these metabolic diseases and increases atherosclerosis progression. The clinical implication of this mechanism-based study is that information obtained will optimize dietary and therapeutic intervention strategies to minimize metabolic diseases in epsilon2 carriers representing more than 10 percent of the population.



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 July 1, 2015 to June 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.



Jun-Ming Zhang, MD

Professor and Vice Chair for Research, Department of Anesthesiology

Jun-Ming Zhang, MD, received a National Institute of Neurological Disorders and Stroke R01, “Study of Activity Dependent Sympathetic Sprouting.” The award runs from Feb. 1, 2016 to Jan. 31, 2021 with total costs of \$2,380,535. Chronic pain conditions such as complex regional pain syndrome are common, long-lasting and debilitating. This work will continue the study of the sympathetic component of pathological pain by testing a novel mechanism of action. Specifically, using rat models, researchers will determine how sympathetic innervation of the dorsal root ganglia contributes to the development and persistence of pathological pain by regulating local immune/inflammatory responses.



Kenneth Sherman, MD, PhD

Professor, Department of Internal Medicine, Division of Digestive Diseases

Kenneth Sherman, MD, PhD, received a National Institute of Allergy and Infectious Diseases R01, “HIV Antiretroviral Therapy and Hepatic Injury.” The award runs from Feb. 15, 2016 to Jan. 31, 2020 with total costs of \$2,124,403. Patients with HIV are at risk for liver injury and scarring. Use of some types of antiviral drugs may slow disease progression. Researchers will study the role of one class of drugs (CCR5 blockers) to alter liver scarring.

CO-INVESTIGATORS:

Jason Blackard, PhD, Department of Internal Medicine, Division of Digestive Diseases

Mohamed Tarek Shata, MD, PhD, Department of Internal Medicine, Division of Digestive Diseases



Peter Stambrook, PhD

Professor, Department of Molecular Genetics, Biochemistry and Microbiology
Director, Division of Addiction Sciences

Peter Stambrook, PhD, received a National Institute of Environmental Health Sciences T32, “Environmental Carcinogenesis and Mutagenesis.” The award runs from Sept. 30, 2015 to June 30, 2020 with total costs of \$2,097,985. This program emphasizes cross-training in multiple disciplines to comprehensively and better understand and address important environmental health issues. The program trains graduate students and postdoctoral fellows to give them the expertise to creatively further our understanding of environmental exposure and its impact on human diseases including cancer, and how best to minimize the exposure or ameliorate progression of the disease.

CO-INVESTIGATORS:

Zalfa Abdel-Malek, PhD, Department of Dermatology



Xiaoting Zhang, PhD

Associate Professor, Department of Cancer Biology

Xiaoting Zhang, PhD, received a National Cancer Institute R01, “Role of MED1 in HER2-driven Breast Tumorigenesis.” The award runs from July 1, 2015 to June 30, 2020 with total costs of \$1,807,125. This proposal aims to understand the role of a key estrogen receptor co-activator (MED1) in HER2-driven breast tumorigenesis in the process of cancer growth, stem cell formation and metastasis. Completion of the study is expected to not only broaden the knowledge base in these areas, but will also provide potential new therapeutic agents for the treatment of human breast cancer.

CO-INVESTIGATORS:

Jun-Lin Guan, PhD, Department of Cancer Biology

Peixuan Guo, PhD, Department of Biomedical Engineering

Qianben Wang, PhD, Ohio State University College of Medicine

Keith Stringer, MD, Department of Pathology and Laboratory Medicine



Melissa Delbello, MD

Professor and Chair, Department of Psychiatry and Behavioral Neuroscience

Melissa Delbello, MD, received a National Institute of Mental Health R01, “1/2-Mechanisms of Antidepressant-Related Dysfunctional Arousal in High-Risk Youth.” The award runs from Sept. 23, 2015 to July 31, 2020 with total costs of \$1,777,500. Antidepressants are among the most commonly prescribed drugs used by American youth today. However, certain adverse events from antidepressants have been associated with the development of serious lifelong psychiatric disorders. This research will help to identify mechanisms and modifiable neurobiological risk factors for antidepressant-related adverse events in youth that could prevent the development of lifelong and adverse long-term outcomes.

CO-INVESTIGATORS:

Jeffrey Welge PhD, Department of Psychiatry and Behavioral Neuroscience

Luis Patino Duran, MD, Department of Psychiatry and Behavioral Neuroscience



Michael Tranter, PhD

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



Jack Rubinstein, MD

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

Michael Tranter, PhD, and Jack Rubinstein, MD, received a National Heart, Lung and Blood Institute R01, “Investigation of Human Antigen R (HuR) as a Novel Mediator of Cardiac Hypertrophy.” The award runs from July 1, 2015 to March 31, 2021 with total costs of \$1,777,500. This research will determine the functional role of HuR in pathological hypertrophy, the downstream targets of HuR in hypertrophic myocytes, the upstream mechanisms by which HuR is activated in the hypertrophic heart and the therapeutic potential of HuR inhibition for the prevention or treatment of pathological cardiac hypertrophy.

CO-INVESTIGATORS:

John Lorenz, PhD, Department of Molecular and Cellular Physiology
Justin Benoit, MD, Department of Emergency Medicine



Mark Baccei, PhD

Associate Professor, Department of Anesthesiology

Mark Baccei, PhD, received a National Institute of Neurological Disorders and Stroke R01, “Developmental Regulation of Intrinsic Excitability in Spinal Pain Networks.” The award runs from June 15, 2016 to May 31, 2021 with total costs of \$1,728,125. The overall objective of this research is to identify the key factors regulating the firing of ascending projection neurons during early life and to determine the role of this activity in modulating primary afferent synapses onto these cells. This research is significant because it will reveal mechanisms that control ascending nociceptive transmission from the spinal cord to the developing brain, and will also yield new insight into why muscle afferents are more capable of evoking hyperexcitability within central pain circuits.



Jun-Lin Guan, PhD

Professor and Chair, Department of Cancer Biology

Jun-Lin Guan, PhD, received a National Institute of Neurological Disorders and Stroke R01, “Mechanisms of Neural Stem Cells Regulation by Autophagy.” The award runs from Sept. 1, 2015 to Aug. 31, 2020 with total costs of \$1,728,125. Autophagy is an essential cellular function that plays crucial roles in a variety of biological and disease processes. The characterization of key autophagy genes and pathways in the regulation of neural stem cells (NSC) will significantly advance our understanding of the molecular and cellular mechanisms in the regulation of NSCs that will contribute to new treatments for neurodegenerative and related diseases, given the critical role of NSCs to generate new neurons as a function of tissue homeostasis and after brain injury throughout adulthood.



Laura Conforti, PhD

Associate Professor, Department of Internal Medicine, Division of Nephrology and Hypertension

Laura Conforti, PhD, received a National Cancer Institute R01, “Hypoxia and Potassium Channel Activity in T Lymphocytes.” The award runs from July 1, 2015 to June 30, 2020 with total costs of \$1,498,123. One of the functions of the immune system is to attack cancer cells and destroy them. Unfortunately, there are special conditions in tumors that inhibit immune cell ability to do this. This work will study how the effects of those conditions on ion channels in the membrane of immune cells contribute to the failure of the immune system to fight cancer cells.



Jason McMullan, MD

Associate Professor, Department of Emergency Medicine

Jason McMullan, MD, received an Air Force Research Laboratory Award, “Intranasal Ketamine as an Adjunct to Fentanyl for the Prehospital Treatment of Acute Traumatic Pain.” The award runs from May 2, 2016 to May 1, 2019 with total costs of \$1,468,250. This research will identify a safe and effective pain management protocol for use in the battlefield, and to evaluate potential long-term benefits of acute ketamine use. The scope of this technical effort will evaluate the immediate benefits of treatment with fentanyl, with or without single-dose ketamine, and provide preliminary data on potential long-term benefits.

CO-INVESTIGATORS:

Christopher Lindsell, PhD, Department of Emergency Medicine
Edward Otten, MD, Department of Emergency Medicine
Jason Schragger, MD, Department of Surgery
Jay Johannigman, MD, Department of Surgery
Kathleen Chard, PhD, Department of Psychiatry and Behavioral Neuroscience



Christopher Bernheisel, MD

Associate Professor, Department of Family and Community Medicine

Christopher Bernheisel, MD, received a Health Resources and Services Administration award, “Primary Care Training and Enhancement.” The award runs from July 1, 2015 to June 30, 2020 with total costs of \$1,388,647. The overall goal of this project is to equip family medicine residents, geriatric fellows, academic clinical faculty from both disciplines and community primary care physicians with the knowledge and skills needed to become confident and competent in becoming health care transformation “Change Agents.” This will enable them to transform primary care practice beyond the training project and to identify and meet the needs of their patient population.

CO-INVESTIGATORS:

Christopher White, MD, Department of Family and Community Medicine
Jeffrey Shlaudecker, MD, Department of Family and Community Medicine
Megan Rich, MD, Department of Family and Community Medicine
Nancy Elder, MD, Department of Family and Community Medicine



Kenneth Sherman, MD, PhD

Professor, Department of Internal Medicine, Division of Digestive Diseases

Kenneth Sherman, MD, PhD, received a National Institute of Diabetes and Digestive and Kidney Diseases R01, “Hepatitis E in HIV-Infected Patients.” The award runs from Sept. 23, 2015 to Aug. 31, 2020 with total costs of \$1,374,995. Hepatitis E (HEV) is an emerging pathogen that is being recognized with increasing prevalence in the United States. Limited data suggests it may have a unique natural history in those with HIV infection. This study is designed to determine the clinical significance of HEV infection in HIV-infected patients.

CO-INVESTIGATORS:

Mohamed Tarek Shata, PhD, Department of Internal Medicine, Division of Digestive Diseases

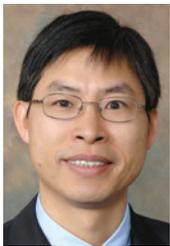
Jason Blackard, PhD, Department of Internal Medicine, Division of Digestive Diseases



Timothy Pritts, MD, PhD

Associate Professor, Department of Surgery

Timothy Pritts, MD, PhD, received an Air Force Research Laboratory award, “Effect of Fluid Resuscitation Strategy During En Route Care on Acute Lung Injury After Hemorrhage and Burn Injury.” The award runs from Feb. 26, 2016 to Feb. 25, 2019 with total costs of \$1,328,869. The principal purpose of this research is to determine the optimal resuscitation strategy for prevention of acute lung injury in combined hemorrhage and burn injuries during the phases of initial care, tactical evacuation and strategic evacuation.



Jianjun Chen, PhD

Associate Professor, Department of Cancer Biology

Jianjun Chen, PhD, received a National Cancer Institute R01, “Potential Therapeutic Implications of Targeting miR-150 in Acute Myeloid Leukemia.” The award runs from Sept. 1, 2015 to Dec. 31, 2018 with total costs of \$1,326,783. This project will not only shed new light on an understanding of the pathological role and functional mechanism(s) of miR-150 and of the molecular mechanisms underlying the development, maintenance and LSC self-renewal of MLL-rearranged leukemia, but also may lead to the development of a specific and effective novel therapeutic approach to treat this presently therapy-resistant disease using a targeted nanoparticle system.



Bryan Mackenzie, PhD

Associate Professor, Department of Molecular and Cellular Physiology

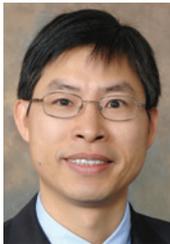
Bryan Mackenzie, PhD, received a National Institute of Diabetes and Digestive and Kidney Disease UCLA sub / R01, “Structure-function Analysis of Ferroportin.” The award runs from July 1, 2015 to April 30, 2020 with total costs of \$1,316,6613. These studies are designed to uncover the molecular mechanisms of ferroportin, discover new roles for ferroportin and identify novel mechanisms by which its activity is regulated.



Jay Johannigman, MD

Professor, Department of Surgery
Director, Division of Trauma and Critical Care

Jay Johannigman, MD, received an Air Force Research Laboratory Award, “Field Deployable Whole Blood Collection and Transfusion Set.” The award runs from July 29, 2015 to March 28, 2017 with total costs of \$1,254,585. This project will create a mass producible field deployable whole blood collection and transfusion kit with a Food and Drug Administration-approved whole blood, platelet sparing and leukoreduction filter. This will use the current FDA-approved Terumo BCT, Imuflex WB-SP Blood Bag, which is currently configured for separating whole blood into its components (platelets, plasma, red blood cells), and reconfigure it into an inline whole blood collection and transfusion configuration (maintaining its platelet sparing and leukoreduction filter).



Jianjun Chen, PhD

Associate Professor, Department of Cancer Biology

Jianjun Chen, PhD, received a National Cancer Institute award, “The Role and Functional Mechanism of TET-1 in MLL-rearranged Leukemia.” The award runs from April 3, 2015 to March 31, 2019 with total costs of \$993,605.



Daniel Woo, MD

Professor and Vice Chair of Clinical Research, Department of Neurology and Rehabilitation Medicine

Daniel Woo, MD, received a National Institute on Minority Health and Health Disparities subaward, “Recurrent Hemorrhagic Stroke in Minority Populations.” The award runs from Feb. 1, 2016 to Jan. 31, 2021 with total costs of \$953,269. The overall goal of this research is to leverage the ERICH study population to identify the biological mechanisms underlying the progression of the cerebral small vessel diseases underlying ICH in Latino and African Americans.

FACULTY RESEARCH HONORS



James Herman, PhD, Donald C. Harrison Professor and vice chair of basic research in the Department of Psychiatry and Behavioral Neuroscience, was named a Distinguished Research professor (STEMM) by the university. Dr. Herman is the principal investigator on three R01 research grants—all studying different aspects of how the brain controls stress activity and disease that are associated with stress—and a training grant from the National Institutes of Health, and has authored more than 200 peer-reviewed articles. He serves as editor-in-chief of the international journal *Stress*, holds two associate editor positions with journals and serves on several editorial boards. He has also served on several advisory boards and national and international grant review panels.



Kim Dietrich, PhD, professor of environmental health, received the OHHN Leadership Award from The Ohio Healthy Homes Network (OHHN), a nonprofit organization that promotes healthy homes and lead-safe environments for Ohioans. OHHN recognized Dr. Dietrich for his outstanding leadership in the Healthy Homes field. Dr. Dietrich is nationally recognized for his work on the Cincinnati Lead Study, which at 36 years is the longest-running research on the impacts of lead in children and young adults. The Cincinnati Lead Study has followed 376 male and female infants born in high risk areas of Cincinnati between 1979 and 1984.



Carolyn Price, PhD, professor of cancer biology, was named a fellow in the American Association for the Advancement of Science (AAAS). Dr. Price was honored for her contributions to the field of telomere biology in the area of telomere replication. Her lab focuses on the structure and function of telomeres, the DNA-protein complexes that cap the ends of chromosomes. Telomeres are essential for genome stability as defects in their structure and/or failure to fully replicate the telomeric DNA lead to chromosome shortening and end-to-end fusion of chromosomes. This loss of telomere function can cause bone marrow failure and lung disease.



Steve Davidson, PhD, assistant professor of anesthesiology, was named a 2016 Rita Allen Foundation Scholar. He will receive grants of up to \$110,000 annually for a maximum of five years to pursue innovative research on the development and suppression of cancer, environmental influences on behavior and the mechanisms and perception of pain. Dr. Davidson was selected for the Rita Allen Foundation Award in Pain in partnership with the American Pain Society. Dr. Davidson's research seeks to reveal pathways to new therapies by applying knowledge about differences between the sensory and emotional dimensions of pain. His project "How Does the Brain's Processing of Emotion Affect the Perception of Pain?" will study how neurons in the thalamus participate in the emotional perception of pain.



Simon Tremblay, PharmD, research assistant professor of surgery, was awarded the American Transplant Society's (AST) Young Investigator award at the American Transplant Congress. The award goes to investigators who are the first author on a submitted abstract and must be within two years completion of their training and/or fellowship in a program in which either an American Society of Transplant Surgeons or AST member is associated. Dr. Tremblay completed his fellowship with the UC transplant team in 2015 and was the first author on "A Prospective Carfilzomib-Based Desensitization Trial: Phase 1 Results."



Daniel Nebert, MD, emeritus professor of environmental health, was awarded the 2016 R.T. Williams Distinguished Scientific Achievement Award. This prestigious award is presented by the International Society for the Study of Xenobiotics (ISSX) to an individual who has made influential scientific contributions to the field. Dr. Nebert has dedicated his research and contributed revolutionary discoveries to the field of xenobiotics for more than 50 years.



Evangelia (Litsa) Kranias, PhD, Hanna Professor and director of cardiovascular biology in the Department of Pharmacology and Cell Biophysics, was invited to serve a two-year term on the American Heart Association Leadership Committee as senior advisor of the Basic Cardiovascular Sciences Early Career Committee of the Council on Basic Cardiovascular Sciences. Dr. Kranias has also been appointed a member of the Scientific Advisory Board of the Venetian Institute of Molecular Medicine (VIMM). The advisory board evaluates research activity at the VIMM and consists of well-renowned scientists including Nobel Laureates.

Researchers from the Department of Environmental Health, Center for Environmental Genetics and the Department of Internal Medicine, Division of Cardiovascular Health and Disease, were awarded first place for Best Publication of the Year in 2015 by the Society of Toxicology. Authors on the paper, "Ah Receptor Signaling Controls the Expression of Cardiac Development and Homeostasis Genes," include Vinicius Carreira, PhD; Yunxia Fan, PhD; Qing Wang, PhD; Xiang Zhang, PhD; Hisaka Kurita, PhD; Chia-I Ko, PhD; Mindi Naticchioni; Min Jiang, PhD; Sheryl Koch, PhD; Mario Medvedovic, PhD; Ying, Xia, PhD; Jack Rubinstein, MD; and Alvaro Puga, PhD. The paper was published in the journal *Toxicology Science* in October 2015.



Patrick Tso, PhD, professor of pathology and laboratory medicine and director of the Lipid Biology Group, received the Obesity Metabolism and Nutrition Research Mentor Award from the American Gastroenterological Association. The award is given to scientists with a record of training the next generation of scientists.

Members of the Department of Environmental Health's Environmental and Occupational Hygiene Program received the 2016 John M. White Award for research in respiratory protection. Each year the American Industrial Hygiene Association Respiratory Protection Committee selects one article published in a previous year for the award. The authors received the award at the 2016 American Industrial Hygiene Conference and Exposition for their paper titled "Penetration of Combustion Aerosol Particles Through Filters of NIOSH-Certified Filtering Facepiece Respirators" published in the Journal of Occupational and Environmental Hygiene.



Vivien Coulson-Thomas, PhD, assistant professor of ophthalmology, received the Young Investigator Award from the British Society for Matrix Biology (BSMB) at its annual meeting in Edinburgh. The award recognizes early career researchers who have made a significant contribution to matrix biology and excelled in the early stages of their research careers. The winner of the Young Investigator Award receives £1,000 and delivers the John Scott Lecture at one of the biannual meetings of the BSMB.



Jay Johannigman, MD, professor of surgery and director of the Division of Trauma and Critical Care, was awarded the Distinguished Service Award at the 2015 Military Health System Research Symposium held in Fort Lauderdale, Florida. Dr. Johannigman, a colonel in the U.S. Air Force Reserves, was honored for his long-term contributions to military medicine and care of wounded military members. In addition to his many years of contribution to Cincinnati C-STARS (Center for Sustainment of Trauma and Readiness Skills) at UC Medical Center, Dr. Johannigman has published and presented widely on innovations in military medicine and was instrumental in forming the UC Institute for Military Medicine. He also has been deployed on six tours of duty at military hospitals in southern Iraq and Afghanistan.



Thomas Herzog, MD, professor of obstetrics and gynecology, was named to the Gynecologic Oncology Group (GOG), Inc. Foundation Board of Directors. The board is made up of 11 voting members. The Gynecologic Oncology Group is a nonprofit international organization with the goal of promoting excellence in the quality and integrity of clinical and basic scientific research in the field of gynecologic malignancies.



David Bernstein, MD, professor of internal medicine in the Division of Immunology, Allergy and Rheumatology, was appointed to the Allergy, Immunology and Transplantation Research Committee (AITC) for the National Institute of Allergy and Infectious Diseases (NIAID). Bernstein's tenure runs from July 1, 2015, to June 30, 2019. The AITC reviews T32 training grants for NIAID and other special grant applications.



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." Dr. Subramanian Vignesh also received a New Investigator Scholar Award from the UC Center for Environmental Genetics funded by the National Institute 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."

STUDENT/RESIDENT AWARDS

Three graduate students in the College of Medicine's Cancer and Cell Biology Graduate Program received Ruth L. Kirschstein Predoctoral Individual National Research Service Awards (F31 awards) from the National Institutes of Health to conduct cancer research in the labs of UC scientists and promote their growth as future researchers. The purpose of the F31 program is to help promising predoctoral students obtain individualized, mentored research training from faculty sponsors while conducting dissertation research and developing their skills to become independent scientists in the field.

Graduate research assistants in the program who were granted the award include:

Mark Althoff who will be working in the lab of José Cancelas, MD, PhD, director of research at Hoxworth Blood Center and a professor in UC's Department of Pediatrics.

Nick Brown who will be working in the lab of Susan Waltz, PhD, professor in the Department of Cancer Biology and a member of both the Cincinnati Cancer Consortium and UC Cancer Institute.

Sonya Ruiz-Torres who will be working in the lab of Susanne Wells, PhD, a professor in the Department of Pediatrics and a member of both the Cincinnati Cancer Consortium and UC Cancer Institute.

Four Class of 2018 medical students were recognized for their research posters at the 57th annual National Student Research Forum held April 28–29, 2016, at the University of Texas Medical Branch in Galveston, Texas. The winners were:

Greg Lavins, first place for a poster presentation in neuroscience and cell biology titled “Classification of Preschool Wheezing Phenotypes Via Cluster Analysis of Electronic Health Record Data.”

Stephanie Kerlakian, first place for a poster presentation in radiology research titled “Advanced MR-Based Imaging in Cystic Fibrosis.”

Meera Basu, first place for a poster presentation in obstetrics and gynecology titled “Expression of Human Placental Corticotropin-Releasing Hormone During Inflammatory Stress.”

Michael Zhou, second place for a poster presentation in radiology research titled “Quantitative MRI of TGF- α -Induced Pulmonary Fibrosis.”

Katelyn Melgar, a student in the Medical Scientist Training Program, received a 2015 Minority Graduate Student Abstract Achievement Award from the American Society of Hematology (ASH) and presented her abstract, titled “Novel Small Molecule FLT3 Inhibitors for the Treatment of FLT3-ITD AML,” at the 57th ASH annual meeting Dec. 5 – 8, 2016 in Orlando, Florida. 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.

A project from **Keith Saum**, a doctoral student in the Division of Nephrology and Kidney CARE Program, was accepted into the University of Cincinnati Technology Commercialization Accelerator and received \$40,000 in funding. The project is titled, “Flow Conditioning Vascular Implant for Arteriovenous Fistula Maturation.”

Richard Godby, a Class of 2017 medical student, won the nationally competitive Hematology Opportunities for the Next Generation of Research Scientists (HONORS) Award from the American Society of Hematology (ASH). He received \$5,000 to conduct novel, high-impact research as well as a stipend to travel to ASH’s annual meetings for the next two years to share his research findings and network with peers.

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 Filak, MD
Senior Associate Dean for Academic Affairs

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

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

Myles Pensak, MD
Senior Associate Dean for Clinical Programs

Faculty

Tenure/Tenure Track.....	385
Clinical Track.....	1,229
Research Track.....	158
Field Service Track.....	43
Educator Track.....	16
Volunteer/Adjunct/Visiting.....	502

All Funds Operating Revenue* FY2016 (in millions)

Clinical Practice.....	\$576.8
Federal/Non-Federal Research.....	250.7
Hospitals.....	220.1
State Appropriations.....	43.6
Gift and Endowment Income.....	29.0
Other Income.....	115.0
Tuition.....	34.8
Total Operating Revenue.....	\$1,270.1

* From LCME 1-A

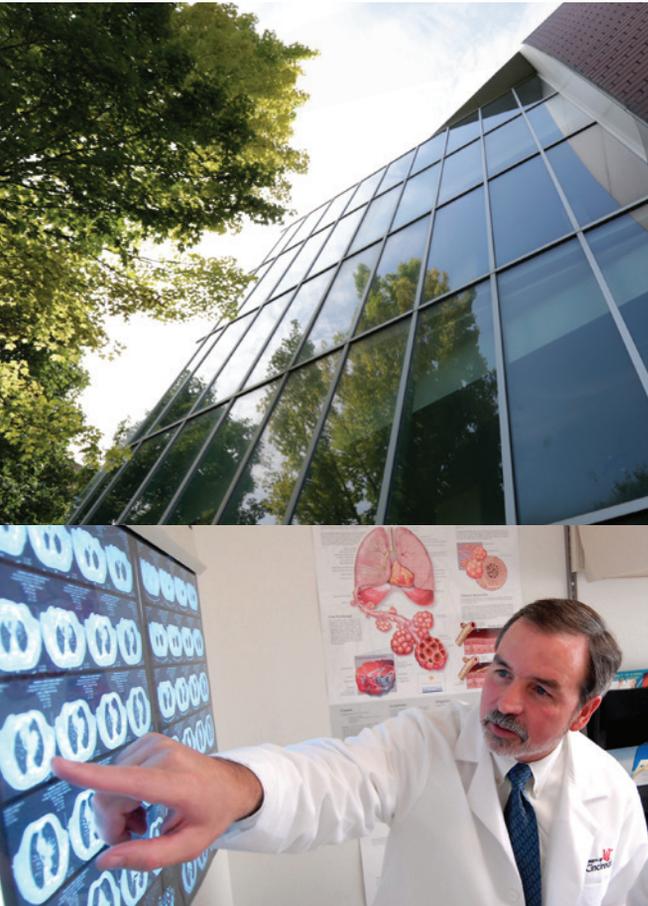
College of Medicine Facilities

Buildings.....	16
Research Space (net square feet).....	446,368
Total Space (gross square feet).....	2.31 million

Development

Total Dollars Raised (fund year 2016).....	\$17,190,191
College of Medicine Endowments.....	\$426,141,772

(market value as of 6/30/2016)





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.

The university responds promptly and effectively to allegations of discrimination, harassment, and retaliation. It promptly conducts investigations and takes appropriate action, including disciplinary action, against individuals found to have violated its policies, as well as provides appropriate remedies to complainants and the campus community. The university takes immediate action to end a hostile environment if one has been created, prevent its recurrence, and remedy the effects of any hostile environment on affected members of the campus community.

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
Senior 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; grunowtl@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



University of Cincinnati College of Medicine
3230 Eden Avenue
PO Box 670555
Cincinnati, OH 45267

med.uc.edu