

University of Cincinnati

**College of Medicine**

# Research

**ANNUAL REPORT  
FY2018**





**The University of Cincinnati College of Medicine—a Clinical and Translational Science Award (CTSA) institution—is ranked No. 38 among research medical schools by *U.S. News & World Report*. The college celebrates its bicentennial in 2019. It was founded as the Medical College of Ohio, the first medical school in Ohio, and today is the second oldest public medical school in the country.**

**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.**

**ABOUT THE BACKGROUND** Infiltration of functionally competent cytotoxic (CD8+) T lymphocytes is necessary for effective immune surveillance in cancer. This image depicts a section from a head and neck cancer stained for cytokeratin (tumor cell marker, yellow), CD8 (green), Ki-67 (cell proliferation marker, magenta), and Kv1.3 channels (red). The CD8+ lymphocytes that showed low Kv1.3 expression also showed decreased cell proliferation, indicating that Kv1.3 channels could be potential markers of the function of tumor-infiltrating T cells in head and neck cancer. This confocal image was taken by Ameet Chimote, PhD, from Dr. Laura Conforti's laboratory in the Department of Internal Medicine and was obtained on the Zeiss LSM 710 Confocal Microscope in the Live Imaging Core. This image was selected to be on the cover of January 2017 issue of *Cancer Research*. To read more on this research, visit: [cancerres.aacrjournals.org/content/77/1/53.long](http://cancerres.aacrjournals.org/content/77/1/53.long)

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## College of Medicine OFFICE OF RESEARCH

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Senior Associate Dean for Research

**Brett M. Kissela, MD**  
Senior Associate Dean for Clinical Research

**Ken D. Greis, PhD**  
Associate Dean for Research Core Facilities

**Iain Cartwright, PhD**  
Associate Dean for Graduate Education

**Jack Kues, PhD**  
Associate Dean Continuous Professional Development

**Jason Blackard, PhD**  
Director of Medical Student Research Initiatives

**Jen Veevers, PhD**  
Scientific Writer

**Brienne Sheehan**  
Program Director

## *From the Office of the Dean*



**Andrew T. Filak Jr., MD**  
Interim Senior Vice  
President for Health  
Affairs and Dean



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



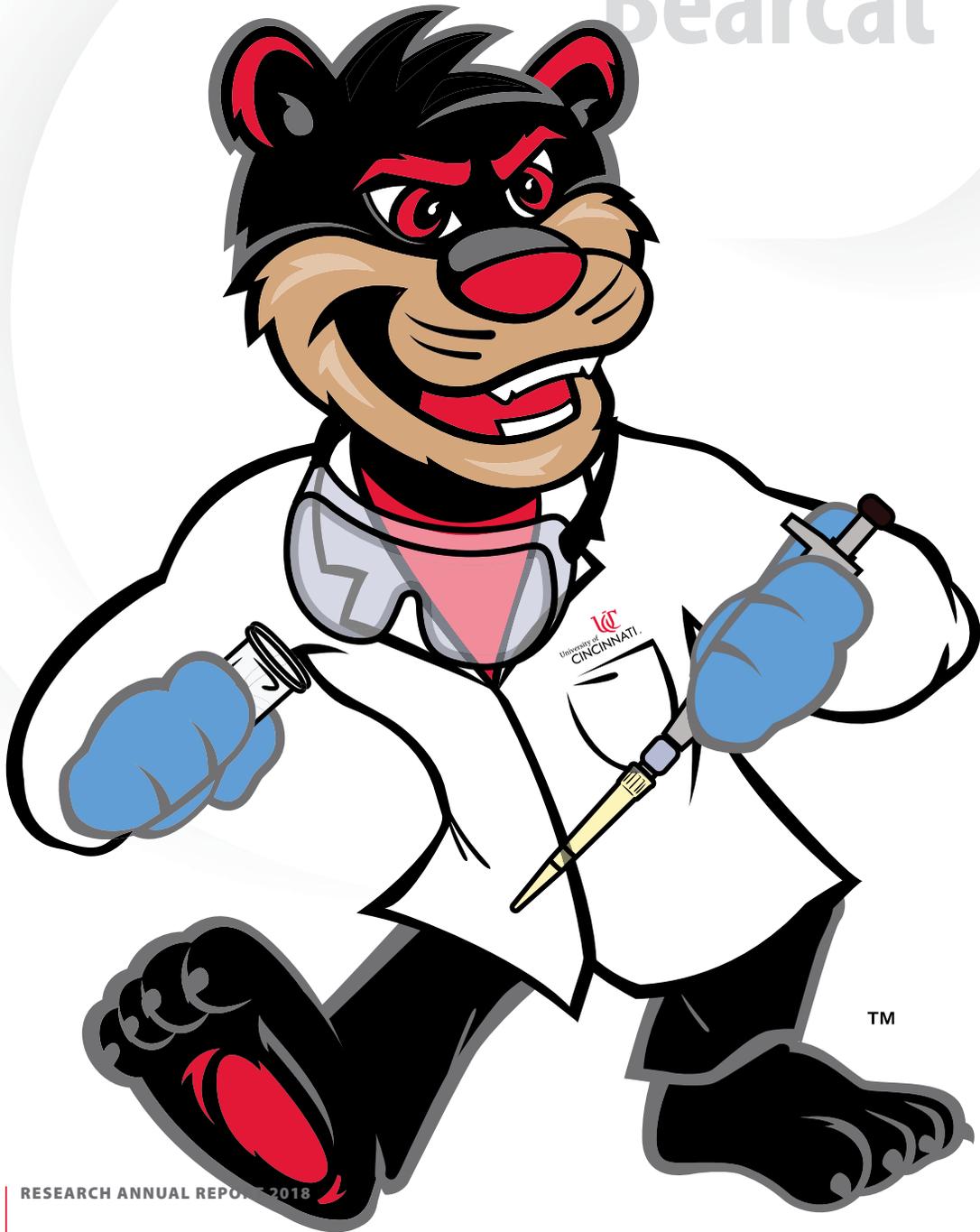
**Brett M. Kissela, MD**  
Senior Associate Dean  
for Clinical Research

**T**HE UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE was established in 1819 as the Medical College of Ohio by our pioneering physician founder, Daniel Drake. We are the second-oldest public college of medicine in the United States. Our research mission has been in our DNA since those early days and continues to provide groundbreaking discoveries in a myriad of diverse areas of medicine from cancer to cardiology to stroke and infectious diseases. We continue to celebrate our rich history of research success by introducing a new member to the College of Medicine, the Research Bearcat. The Research Bearcat symbolizes the research mission and is prepared for lab success with non-latex gloves, goggles, lab coat and a pipettor. We welcome our new Bearcat and encourage researchers to embrace the college's newest cultural icon.

The **FY2018 Research Annual Report** of the UC College of Medicine tracks our latest research progress, highlights our outstanding researchers and recognizes the successes of our research faculty during this past year. The accomplishments of our faculty reflect our commitment to the career success of our investigators and the deployment of new knowledge, therapies and devices that improve the lives of patients locally and globally.

Welcome

# Research Bearcat



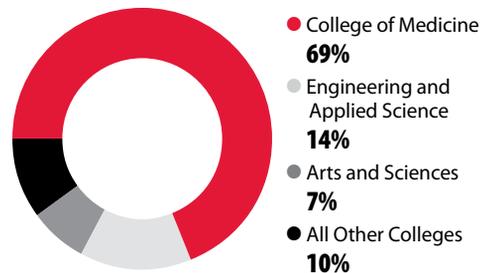
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The total **new grant dollars** rose from \$92.9 million in FY2017 to \$95.1 million in FY2018, contributing significantly to the research mission of the University. This increase is exemplary in an era of tight federal budgets.

Our faculty have risen to the challenges presented by the current research funding environment with an average success rate that exceeds the national average of 20 percent at 26 percent. While we are on track to continue this growth in FY2019, the College recognizes that sustainability will require new investments in research from both the college and the university.

#### FY2018 Research and Clinical Trial Award Revenue

Percentage of Revenue by College



Our **clinical faculty** are sought for their expertise in clinical trials and are leading several large federally funded trial networks. Our clinical trials revenue averaged an increase of 10 percent each year since FY2013. In FY2018, our clinical trialists brought in revenue of \$12,167,796 and increased clinical trials patient enrollment from 1,962 (FY2017) to 2,483 patients. We recognize this remarkable faculty accomplishment and commend our clinical research community on the significant effort this represents.

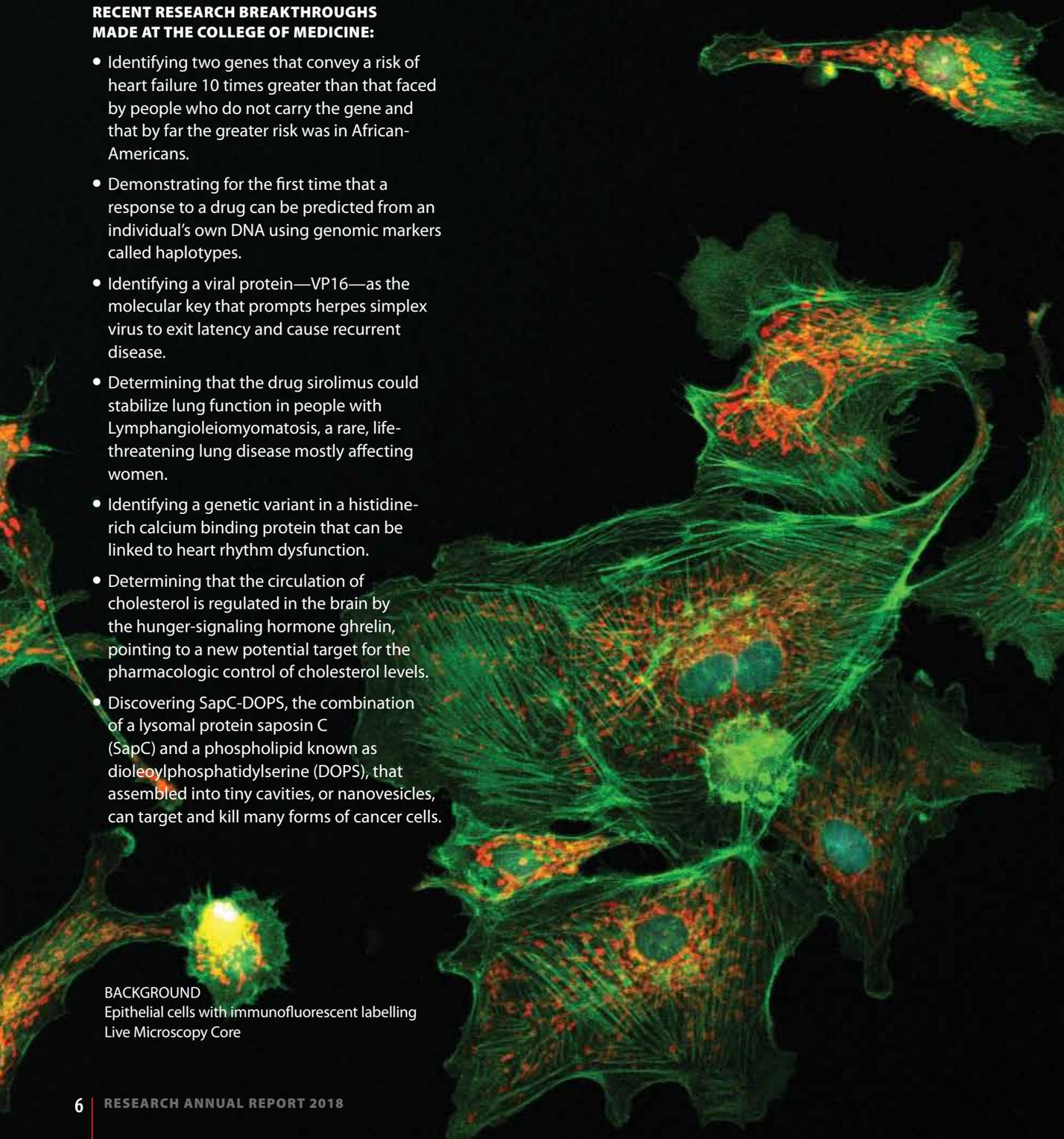


**RECENT RESEARCH BREAKTHROUGHS  
MADE AT THE COLLEGE OF MEDICINE:**

- 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 Lymphangioleiomyomatosis, a rare, life-threatening lung disease mostly affecting women.
- Identifying a genetic variant in a 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.

**BACKGROUND**

Epithelial cells with immunofluorescent labelling  
Live Microscopy Core



Recognizing the vital role that **core facilities and shared equipment** play in the success of our researchers, we initiated core enhancement opportunities beginning in FY2016. These funds allow core directors to validate and offer new innovative services to our faculty to keep them competitive. Additional investments in FY2018 have led to the integration of new microscopy capabilities and the opening of a research Histopathology core as an extension of Clinical Histopathology. We have successfully competed for funds through a Department of Energy program to integrate a research X-ray irradiator system to assist our researchers and clinicians in Radiation Oncology to evaluate and develop more tumor-specific treatment plans that they may be able to take to the clinic. This system will be operational starting in FY2019.

**Training and education of graduate students** represents a critical part of our research mission as we develop the next generation of research scientists that will compete at the forefront of biomedical discovery regionally, nationally and globally. Our master's programs continue to grow in size and popularity, while our PhD programs have achieved notable successes in both scholarship and national recognition for individual students. For the second year running, a College of Medicine doctoral student was recognized with the Presidential Medal of Graduate Student Excellence, while the number of individual National Institutes of Health F30 and F31 National Research Service Awards attained by students stood at 20, a strong testament to the sustained quality and promise of the students recruited to our doctoral programs. We also have achieved continuing success in recruiting increasing numbers of students from underrepresented or disadvantaged backgrounds to our programs. This year, two of these students were elected to the Yale Ciencia Academy, a national program offering sustained exposure to professional development, personal growth and career-focused opportunities.



The college understands the importance of **fundamental and translational research** as the initial steps in the bench to bedside pipeline and as the incubator of the research scientists of the future. To achieve these goals, after an international search James P. Herman, PhD, was appointed Chair of the newly formed Department of Pharmacology and Systems Physiology. Dr. Herman will lead the department faculty into their next phase of research and training. Two new faculty hires in the Department of Molecular Genetics, Biochemistry and Microbiology add to the college's focus areas of neurosciences and regenerative medicine. The departments of Cancer Biology, Environmental Health and Bioinformatics are recruiting additional faculty to complete their missions and visions. The growth in basic research brought about by our scientists at the bench ultimately translates to innovations in clinical care at the bedside as testimony to the academic difference that we as a college at UC provide to the community.

**IN THIS NEXT YEAR**, our goals are to exceed the 2018 funding levels; provide new training opportunities for our research trainees under the direction of the Associate Dean for Graduate Education, Iain Cartwright, PhD and the Director of Medical Student Research Initiatives, Jason Blackard, PhD; continue to invigorate our Research Core Infrastructure under the guidance of the Associate Dean for Research Core Facilities, Kenneth Greis, PhD; and sustain our upward trajectory in the clinical sciences under the leadership of the Senior Associate Dean for Clinical Research, Brett Kissela, MD. An aspirational goal of increasing our grant holdings by \$25 million over the next five years was raised by the university. Attaining this goal will initiate many changes, including new faculty hires 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. •

# FY2018

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**TOTAL NEW GRANT DOLLARS \***

**\$95.1 million**

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**AVERAGE FUNDING SUBMISSION  
SUCCESS RATE †**

**26%**

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**CLINICAL TRIAL REVENUE**

**\$12.1 million**

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**CLINICAL TRIALS PATIENT ENROLLMENT \***

**2,483**

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**EXTERNAL GRADUATE STUDENT  
FELLOWSHIP AWARDS**

**40**

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**U.S. PATENT FILINGS \***

**75**

*\* Increased from FY2017*

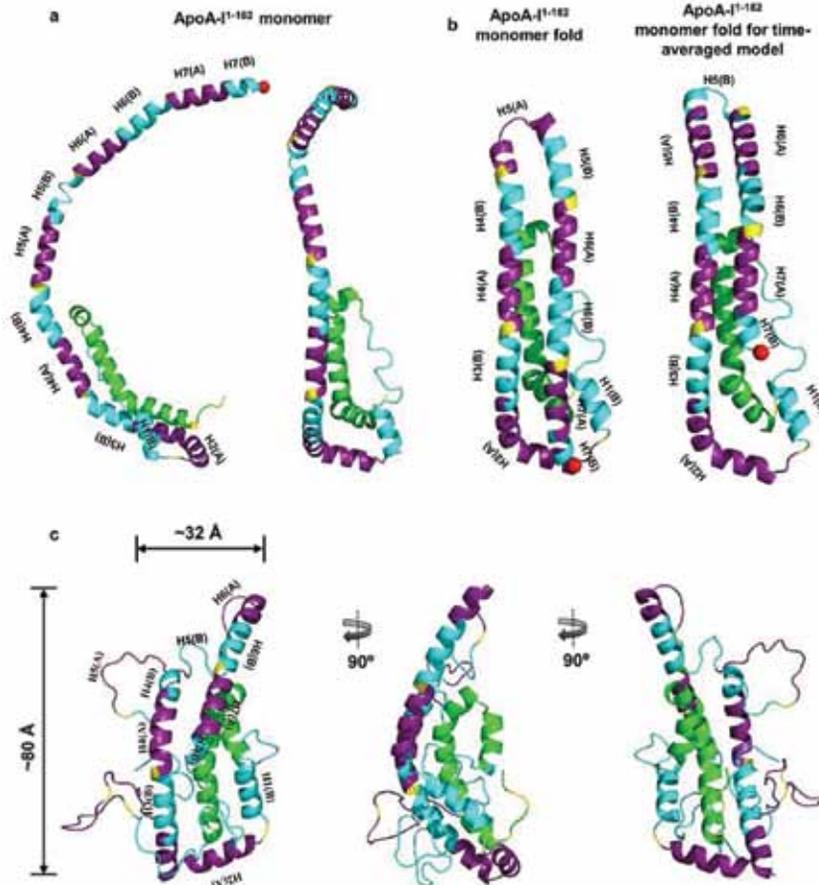
*† Exceeded the national average*



# BASIC SCIENCE

## UC-led Study Could Bring About Strategies to Increase ‘Good’ Cholesterol

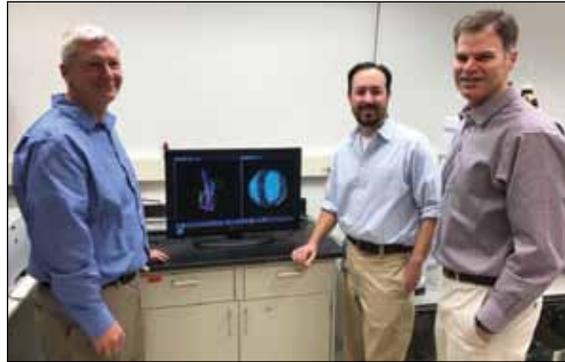
**A**fter decades of individual attempts to identify the structure of the main building block of HDL (high-density lipoproteins), the so-called “good” cholesterol that associates with protection from cardiovascular disease, a research team representing eight academic institutions across the U.S. and Australia has come to agreement on a predictive model. “We are excited to finally have a robust picture of what this protein looks like,” says Sean Davidson, PhD, professor and vice chair in the Department of Pathology and Laboratory Medicine at the UC College of Medicine, and the corresponding author on the study “A Consensus Model of Human Apolipoprotein A-I in its Monomeric and Lipid-Free State” in the journal *Nature Structure and Molecular Biology*.



Dr. Davidson and John Melchior, PhD, a UC postdoctoral fellow, organized a working group of leading lipid structural biologists to attack a fundamental issue in the field of fat metabolism. “All of us, including myself, have been chipping away at the edges of this problem for decades,” says Dr. Davidson, adding that the protein simply doesn’t respond to the typical methods used to model other protein structures. Thus, the working group took a novel approach: they combined data from a variety of indirect experimental techniques from different laboratories to develop a consensus model. The breakthrough took over a year of intense cooperation among scientists who are normally in friendly competition.

“This study was a unique collaborative experience for me. People from all over the U.S. and Australia freely shared what amounts to a couple of centuries (or more) of collective expertise and know-how to come up with a definitive insight into apoA-I structure,” says Kerry Anne-Rye, PhD, a co-author from the University of New South Wales in Australia.

A second factor, low-density lipoprotein (LDL), has been called “bad” cholesterol and can be



UC researchers include (left to right) Tom Thompson, PhD, John Melchior, PhD and Sean Davidson, PhD

harmful. While the body needs some cholesterol to function, when levels of LDL get too high, fatty deposits can accumulate in blood vessels. This causes them to narrow, leading to heart attacks, strokes or other serious vascular problems. HDL is thought to work against this accumulation.

Anchored by work that was awarded the Nobel Prize in 1985, the metabolism of LDL is well understood. This spurred the development of a class of drugs called statins which reduce “bad” cholesterol. However, the biology of HDL has been more elusive and this has complicated the development of HDL targeted drugs, says Dr. Davidson. “Our work, combined with the structure of a critical cell protein that helps assemble HDL published in 2017, finally gives us the tools to propose and test hypotheses on how HDL is generated.” •

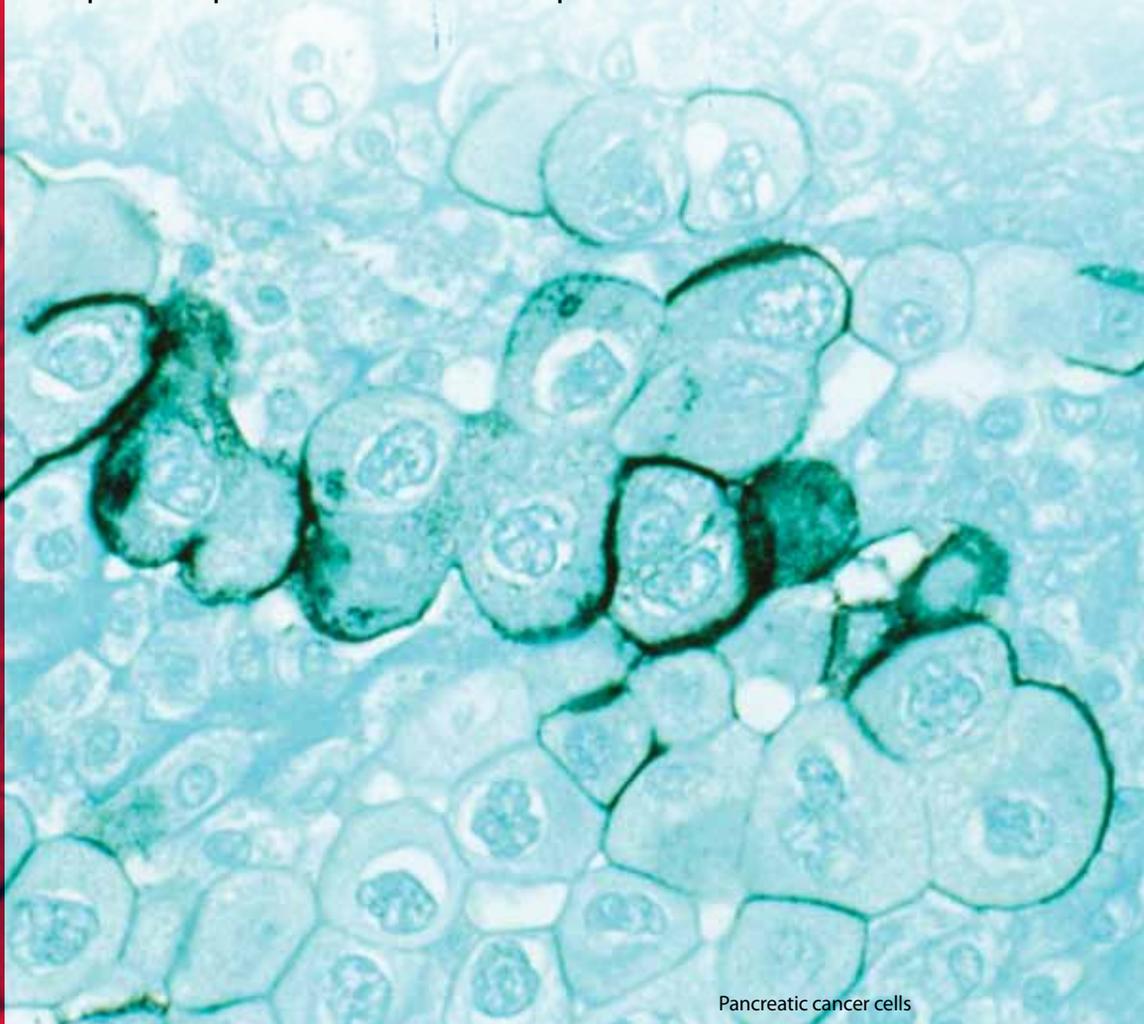
Other UC researchers involved are Allison Cooke, Mark Castleberry and Jamie Morris from Dr. Davidson’s laboratory, and Ryan Walker and Tom Thompson, PhD, from the Department of Molecular Genetics, Biochemistry and Microbiology. Other institutions participating in the study include Vanderbilt University, Children’s Hospital Oakland Research Institute, Medical College of Wisconsin, University of Washington, Boston University and University of Pennsylvania.

This work was supported by an American Heart Association postdoctoral fellowship grant (16POST27710016) and National Heart, Lung, and Blood Institute pre-doctoral fellowship (HL125204-03) and grants R01 HL127649, R01 HL127649, P01 HL026335, R01 HL116518 and P01 HL12803. The mass spectrometry data was acquired in the UC Proteomics Laboratory under the direction of Ken Greis, PhD, on a mass spectrometer funded in part through an NIH S10 shared instrumentation grant (RR027015 Gries).

- Main building block of high-density lipoprotein (HDL) does not respond to typical methods to model protein structures
- HDL biology and targeted drug development remained elusive
- UC organized a working group of experts
- Combined data from indirect techniques to develop a robust predictive model
- Gives researchers tools to propose and test hypotheses on HDL generation
- Published in *Nature Structure and Molecular Biology*

## Targeted Treatment Could Prevent Spread of Pancreatic Cancer, Heart Damage

Researchers at the UC College of Medicine have shown that a new targeted treatment could benefit patients with certain pancreatic tumors by preventing spread of the cancer and protecting their heart from damage—a direct result of the tumor. Higher levels of serotonin among other tumor secretions can cause injury to the valves of the heart over time, leading to cardiac impairment—a condition referred to as cardiac carcinoid disease—in these patients. These findings, reported in the November 2017 issue of *Molecular Cancer Therapeutics*, could lead to another targeted treatment for patients and prevent the onset of additional complications from their cancer.



Pancreatic cancer cells

“Pancreatic neuroendocrine tumors—pancreatic NETs, pNETs or islet cell tumors—are tumors that form from the abnormal growth of neuroendocrine cells in the pancreas,” says lead author Hala Elnakat Thomas, PhD, research assistant professor in the Division of Hematology Oncology, Department of Internal Medicine, and member of the Cincinnati Cancer Consortium and UC Cancer Institute’s Pancreatic Cancer Center. “Most pancreatic NETs are functional, meaning they produce hormones. The overproduction of certain hormones results in a number of symptoms termed carcinoid disease which may impact the patients’ quality of life if not managed appropriately.”

She says mutations in key players of the mTOR pathway, a molecular pathway present and active in several types of cancer, have been identified in pNETs.

“Inhibiting mTOR signaling using everolimus, a targeted therapy, known as a rapalog, for patients with lung and gastroenteropancreatic NETs, has been approved

by the FDA. A rapalog inhibits the mTOR protein by preventing it from activating some signals,” she says.

“However, patients eventually experience progression of cancer on this treatment, highlighting the need for additional therapies. In this study, we focused on pancreatic NETs (pNETs) and thought that treatment of these tumors upon progression on rapalog therapy, with

an mTOR kinase inhibitor (mTORKi), could overcome a number of resistance mechanisms in tumors and delay cardiac carcinoid disease.”

Dr. Elnakat Thomas’ team and colleagues including Jack Rubinstein, MD, a member of the Heart, Lung and Vascular Institute and an associate professor within the College of Medicine, performed preclinical studies using human pNET cells injected into animal models to determine tumor progression and cardiac function in those treated with a rapalog alone or switched to the mTORKi (CC-223) when cancer progression was noticed.

“Our results showed that in the majority of pNETs that progress on rapalog therapy, it is possible to reduce disease progression when switching instead to an mTORKi,

such as CC-223,” Dr. Elnakat Thomas says. “The mTORKi also may lead to additional cardiac benefit by decreasing valvular fibrosis (damage) when compared with placebo or just the rapalog. The mTORKi also inhibit mTOR but they do it differently than rapalogs, and they are stronger inhibitors of signals, so the inhibition is more complete with an mTORKi than a rapalog. This data warrants further testing of the long-term cardioprotective benefit of an mTORKi in neuroendocrine tumor patients prone to carcinoid syndrome. Altogether, these results are timely as an mTORKi therapy called sapanisertib is currently in phase II clinical trial testing in pNET patients with metastatic cancer or tumors that are not reacting to treatment and cannot be surgically removed.” •

This research was supported by grants from the North American Neuroendocrine Tumor Society, Just-in-Time funding from the Cincinnati Cancer Consortium, the UC Department of Internal Medicine Junior Faculty Pilot Project Award and Division of Hematology and Oncology Translational Science Awards. The UC Genomics, Epigenomics and Sequencing Core is partially funded by a National Institute for Environmental Health Sciences Center for Environmental Genetics administrative core grant (P30ES006096).



Dr. Elnakat Thomas

- Patients with pancreatic neuroendocrine tumors (pNETs) treated with a rapalog eventually experience disease progression
- Explored treatment with mTOR kinase inhibitor (mTORKi) compared to rapalog alone
- Found reduced disease progression when switched to mTORKi
- mTORKi mechanism may also provide additional cardiac benefit in NET patients prone to carcinoid syndrome
- Published in *Molecular Cancer Therapeutics*

## Research Shows Possible New Target for Immunotherapy for Solid Tumors

**R**esearch from the University of Cincinnati reveals a potential new target to help T cells (white blood cells) infiltrate certain solid tumors. This study, published in the journal *Science Signaling*, showed that by targeting a certain potassium channel—KCa3.1—the CD8+ T cell migration in patient samples was restored, meaning that they could potentially be more effective in moving in on the tumor and attacking it. CD8+ cells are a type of T cell capable of killing cancer cells.



Laura Conforti, PhD

“Reduced potassium channel activity curbs T cell movement within the tumor,” says Laura Conforti, PhD, professor in the Department of Internal Medicine at the College of Medicine, a researcher within the Cincinnati Cancer Center and UC Cancer Institute and corresponding author on the study. “T cell infiltration in solid tumors is limited by multiple factors found within the tumor’s microenvironment, including adenosine, an immunosuppressive substance accumulating in high amounts in solid tumors.”

Dr. Conforti and her

team, led by Ameet Chimote, PhD, a research associate in the Department of Internal Medicine, analyzed the migration of CD8+ T cells in a 3-D experimental model system that allows the reproduction of some features of the tumor microenvironment and found that when adenosine was present, it inhibited the movement of T cells from cancer patients more than T cells from healthy donors.

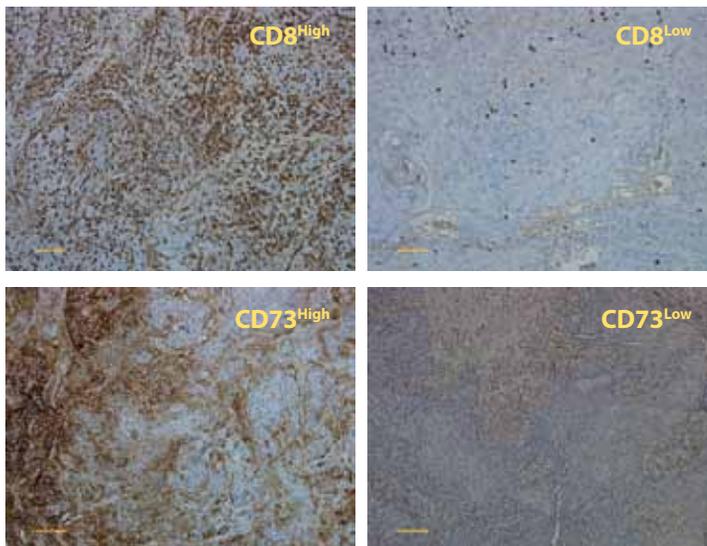
“The increased sensitivity of patient CD8+ T cells to adenosine correlated with reduced KCa3.1 channel activity, but not with adenosine receptor expression or signaling,”

she says. “Treatment with a substance that restores the KCa3.1 channel activity corrects patient CD8+ T cell migration in the presence of adenosine, suggesting that potassium channel activators may help enhance T cell infiltration of adenosine-rich solid tumors, providing another therapy option. This finding could lead to the development of new therapeutic agents to use in combination with approved immunomodulators for the treatment of solid tumors, as they may improve their efficacy.” •

This research was supported by the National Institutes of Health (R01CA95286).

#### **Tumor infiltration is dependent on the sensitivity of circulating CD8+ T cells to adenosine.**

Immunohistochemistry of CD8 (top) and CD73 (bottom) expression (brown signal) in representative HNSCC tumor tissues showing low and high infiltration by CD8+ T cells and low and high CD73 expression. Scale bars, 100  $\mu$ m.



*A defect in KCa3.1 channel activity limits the ability of CD8+ T cells from cancer patients to infiltrate an adenosine-rich microenvironment*  
<http://stke.sciencemag.org/content/11/527/eaq1616>

- T cell infiltration in solid tumors is limited by multiple factors within the tumor’s microenvironment, including adenosine

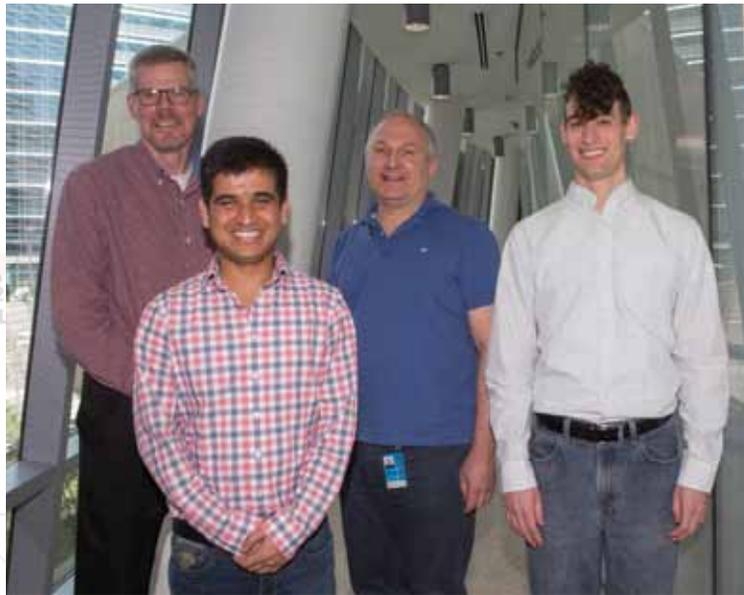
- Restoring the KCa3.1 channel activity corrects patient CD8+ T cell migration in the presence of adenosine

- Finding could lead to new therapeutic agents to use in combination with approved immunomodulators for the treatment of solid tumors

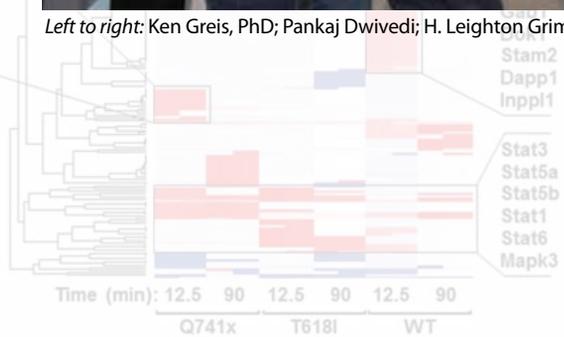
- Published in *Science Signaling*

## New Target in Certain Leukemias Found, Could be Treated With Existing Drug

Researchers at the UC College of Medicine and Cincinnati Children’s Hospital Medical Center have discovered a target in several types of leukemia that could be treated with an existing Food and Drug Administration-approved drug for other types of blood cancers. These findings, published in the July 5, 2018, advance online edition of *Leukemia*, provide important results that could offer another treatment option for patients and make it easier for investigators to move more quickly into a clinical trial, since the drug is already approved.



Left to right: Ken Greis, PhD; Pankaj Dwivedi; H. Leighton Grimes, PhD; David Muench



“Granulocyte-colony stimulating factor receptor (G-CSFR) controls the production of certain types of white blood cells, known as neutrophils,” says Ken Greis, PhD, professor in the Department of Cancer Biology, member of the Cincinnati Cancer Center and UC Cancer Institute and one of the corresponding authors on the paper. “Mutations in G-CSFR have a harmful effect on the production of neutrophils and are reported in patients with several blood disorders including severe congenital neutropenia, chronic neutrophilic leukemia and acute myeloid leukemia. Unfortunately, despite years of research, the malignant signaling of the mutated G-CSFRs is not well understood.”

For this study, researchers used an advanced mass spectrometry-based technology adapted in Dr. Greis’ lab to create a comprehensive signaling network of the normal versus the mutated receptors to understand how abnormal cellular signaling from the mutant receptors results in disease development.

“We are able to look at a regulatory process in cells known as phosphorylation that results in phosphate

groups being attached to the amino acid tyrosine (Tyr) in proteins. These phosphorylation events (pTyr) can act as switches to activate or inactivate proteins and/or specific cellular processes,” Dr. Greis says.

“By evaluating pTyr activity in the normal versus mutant receptor cells, we can produce a network similar to a wiring diagram of cellular regulation,” he adds. “Observed disruptions at any of the nodes in the network for the mutated receptors can then be investigated further to understand and perhaps target the abnormal signaling corresponding to the disease.”

“The analysis of the pTyr activity showed differential phosphorylation that included abnormal activation of Bruton’s Tyrosine Kinase (Btk), a regulatory protein associated with the maturation of antibody-producing B cells,” says H. Leighton Grimes, PhD, director of the Cancer Pathology Program in the Divisions of Experimental Hematology and Pathology at Cincinnati Children’s and a UC professor of pediatrics. Dr. Grimes says when researchers exposed the mutant G-CSFR-expressing

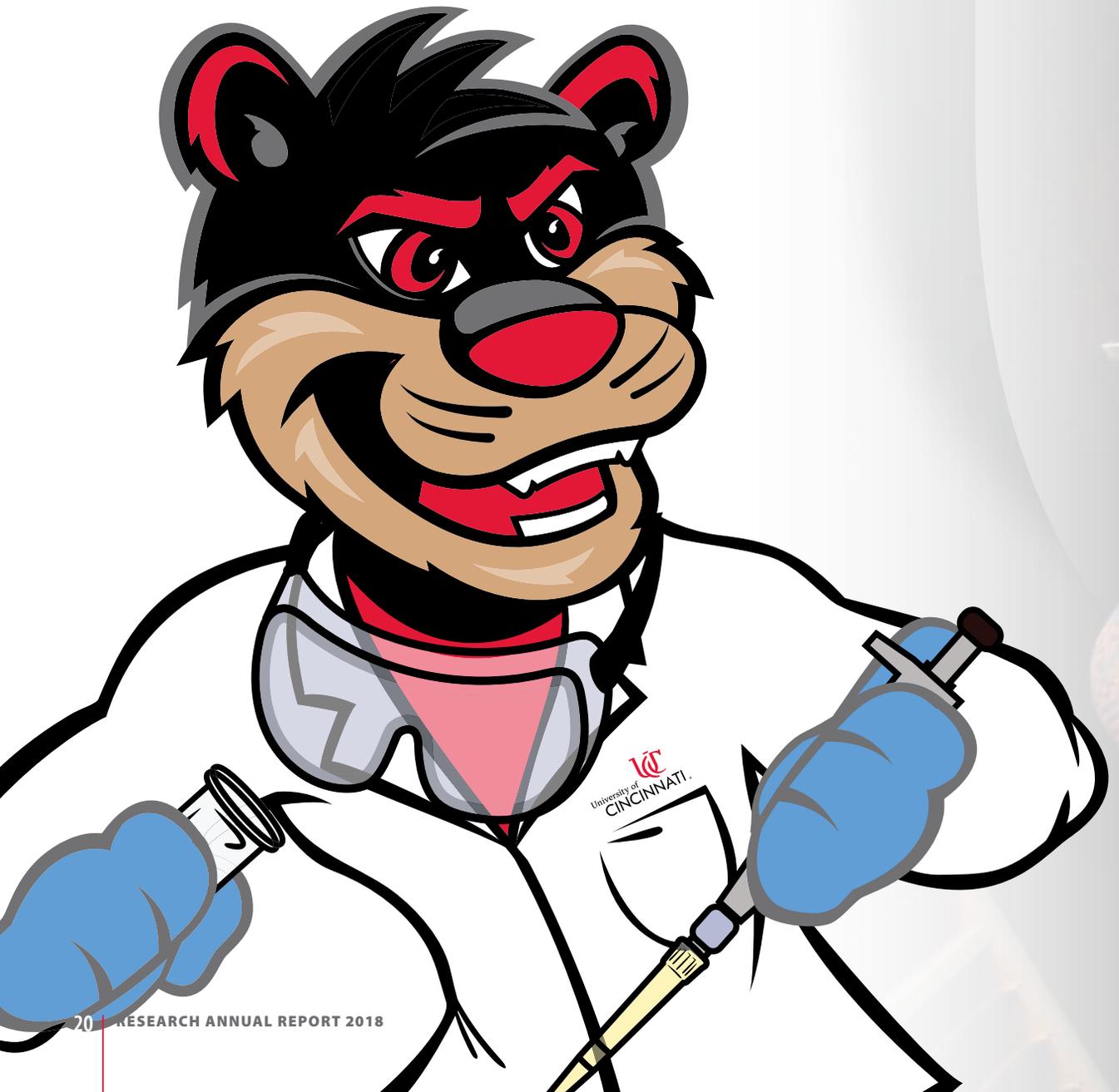
cells to Ibrutinib, the cells showed a dramatically increased sensitivity for inhibition of Btk as compared to cells with normal G-CSFR.

“These data demonstrate the strength of global proteomics (protein-profiling) approaches, like the pTyr profiling used here, in dissecting cancer-forming pathways and points to the possibility that Ibrutinib could be an effective therapy for myeloid leukemias with G-CSFR mutations,” Dr. Greis adds. •

Other investigators on this paper include Mohammad Azam, PhD, and Michael Wagner, PhD, both researchers at Cincinnati Children’s. The research also relied on several research core laboratories including the UC Proteomics Laboratory and the Cincinnati Children’s Research Flow Cytometry and Cell Processing Core laboratories.

This study was funded by the National Institutes of Health (S10 RR027015; T32 ES007250; R01 CA196658, R01 CA155091), the UC Millennium Scholars Fund, the Cincinnati Children’s Hospital Research Foundation, Graduate Student Governance Association funding resources and CancerFree Kids.

- **Mutations in granulocyte-colony stimulating factor receptor cells reported in blood disorders but the disease pathway not well understood**
- **Researchers developed a mass spectrometry-based technology to evaluate phosphorylation (pTyr) activity in normal versus mutant receptor cells**
- **Analysis showed abnormal activation of Bruton’s Tyrosine Kinase (Btk)**
- **Btk already a target of FDA-approved drug**
- **Published in *Leukemia***

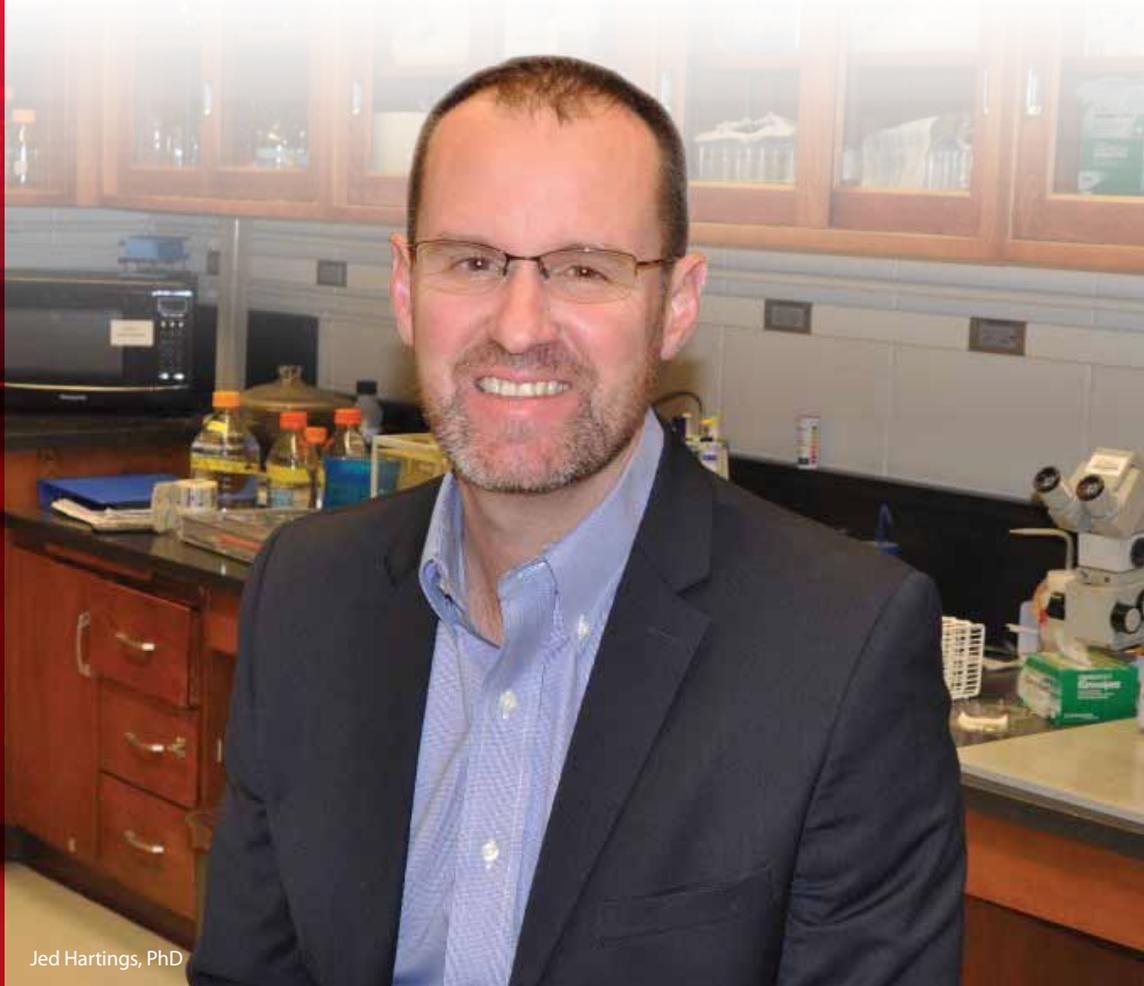




**TRANSLATIONAL RESEARCH**

## UC Research May Provide Clues to How the Brain Dies

It is known that loss of blood and oxygen to the brain can cause significant damage in just minutes, but researchers have not fully understood how exactly it happens or how long doctors have to resuscitate before the damage is irreversible. Now, a study by the University of Cincinnati Gardner Neuroscience Institute and Charité – Universitätsmedizin in Berlin provides a window into what happens in the human brain upon circulatory arrest. The results of this study, reported online in the *Annals of Neurology*, are the first to confirm this sequence of events in humans.

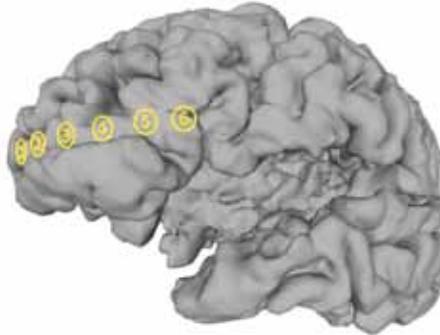


Jed Hartings, PhD

“The brain is most vulnerable to depletion of oxygen and blood supply,” says Jed Hartings, PhD, research associate professor in the Department of Neurosurgery at the College of Medicine and senior author on the study. “We know that massive irreversible injury can occur in less than 10 minutes, but we’ve only had a vague hint of what actually happens in the brain when circulation ceases.”

Until now, researchers have relied on data from animal models. Those studies show that within 20 to 40 seconds, the brain experiences a shutdown when all interneuronal communication ceases. The brain can exist in this quiet mode for a few minutes, but there is then a massive wave of electrochemical energy release, known as “spreading depolarization.” Also described as a “brain tsunami,” this energy loss spreads through the cortex and other areas of the brain, triggering pathophysiological cascades which gradually poison the nerve cells. This wave remains reversible up to a certain point in time: nerve cells will recover fully if circulation is restored before this point is reached. However, if circulation remains disrupted, the cells will die.

Using state-of-the-



Projection of the electrodes of a typical subdural, collinear recording strip on a human brain in the study.

art neuromonitoring technology, researchers placed electrodes on the brain of patients to record electrical activity of the cerebral cortex, known as electrocorticography, after severe brain damage. Recordings were then continued after a clinical and family decision to activate “Do Not Resuscitate” orders. They observed first the shutdown of brain activity during circulatory arrest, followed minutes later by terminal spreading depolarization.

“These results provide fundamental insight into the neurobiology of dying and have important implications for survivable cerebral ischemic insults,” says Dr. Hartings.

“We were able to show that terminal spreading depolarization is similar in humans and animals,” explains Jens Drier, MD, professor of the Center for Stroke Research at Charité – Universitätsmedizin

Berlin and lead author on the study. “Knowledge of the processes involved in spreading depolarization is fundamental to the development of additional treatment strategies aimed at prolonging the survival of nerve cells when brain perfusion is disrupted.”

Dr. Hartings adds, “This knowledge may also be of benefit in the debate on organ donation, when death is declared between two and 10 minutes following circulatory arrest. Until terminal spreading depolarization occurs, the brain remains quite viable.” ●

Additional researchers include: Sebastian Major, MD, Maren Winkler, MD, Eun-Jeung Kang, MD, Denny Milakara, MD, Coline Lemale, MD, Johannes Woitzik, MD, and Jason M. Hinzman, PhD of Charité – Universitätsmedizin Berlin; Brandon Foreman, MD, University of Cincinnati; Vince DiNapoli, MD, PhD, and Norberto Andaluz, MD, of Mayfield Clinic; and Andrew Carlson, MD, University of New Mexico.

- Vulnerability of brain to loss of blood and oxygen known but process not fully understood
- Electrocorticography continued after clinical and family decision to activate “Do Not Resuscitate” orders
- Observed electrochemical release known as spreading depolarization
- Confirmed similarity to animal models
- Insight into spreading depolarization key to develop strategies to prolong nerve cell survival
- Published in *Annals of Neurology*

## Certain Antidepressants More Effective in Treating Youth Anxiety Disorder

**F**or children and adolescents who require medication to treat anxiety, there are two primary classes of antidepressants that are prescribed: selective serotonin reuptake inhibitors (SSRIs) and selective serotonin-norepinephrine reuptake inhibitors (SNRIs). Now, University of Cincinnati research, published in the *Journal of the American Academy of Child and Adolescent Psychiatry*, shows for the first time that SSRIs may be the more effective option.



Jeffrey Strawn, MD, Beau Sauley, MA and Jeffrey Mills, PhD (left to right)

“For a long time there had been this sense that SSRIs work better than the SNRIs in treating anxious youth, but there wasn’t clear evidence to back this up, so we wanted to put that notion to the test,” says Jeffrey Strawn, MD, associate professor in the Department of Psychiatry and Behavioral Neuroscience at the College of Medicine, and lead author on the study. “What we found is that with the SSRIs, compared to SNRIs, people get better faster and see greater improvement overall. There had been some suggestion of this in some individual studies, but this is the first to evaluate the magnitude and trajectory of treatment, or in other words, how much and how quickly people get better.”

For the meta-analysis, UC researchers compiled the data from nine randomized controlled trials. Dr. Strawn partnered with Jeffrey Welge, PhD, research associate professor of psychiatry, and econometricians Jeffrey Mills and Beau Sauley at the UC Lindner College of Business who created a model to examine two things: how quickly the patients got better and by how much.

The models showed that patients started to see improvements from medication around two weeks, with the more significant improvement occurring in the fourth week of treatment. Dr. Strawn says it was also important to look at medication dosage to find out whether the dose of the medication affected improvement.

“We saw that [dosage] didn’t necessarily affect how much the patients improve, but it did affect how quickly they get better,” says Dr. Strawn, indicating that a higher dosage helped this.

Jeffrey Mills, PhD, an associate professor in the Department of Economics at the Lindner College of Business, and Sauley, a doctoral student, used statistical analysis common in economic modeling to apply it to the clinical data.

“We have very complementary skill sets, so interdisciplinary research of this nature is a great example of work that could not be accomplished by any one author,” says Mills. “Everyone’s contributions results in more robust research that none of us would be able to produce alone.”

Dr. Strawn says one significant aspect of this study lies in the fact that it may be immediately applicable to clinical practice.

“In research, many findings impact our work in the clinic years down the road, but this type of work potentially changes how we select medications to treat children and adolescents with anxiety disorders today,” he adds. •

This research was supported by the National Institute of Mental Health (MH106037–Strawn). Strawn has received research support from the National Institutes of Health (NIEHS) as well as Edgemont, Forest, Shire, Lundbeck, and Neuronetics. He has received material support from and provided consultation to Genesight/Assurex Health.

- **Two classes of antidepressants in anxiety treatment: selective serotonin reuptake inhibitors (SSRIs) and selective serotonin-norepinephrine reuptake inhibitors (SNRIs)**
- **Meta analysis of nine randomized controlled trials**
- **Examined how quickly patients improved and by how much**
- **Found that people get better faster and experience greater improvement with SSRIs compared to SNRIs**
- **Published in *Journal of the American Academy of Child and Adolescent Psychiatry***

## Colored Glasses May Provide Light Sensitivity Relief Post-concussion

**F**ollowing a concussion or mild traumatic brain injury (TBI), patients may suffer from light sensitivity or photophobia, making it challenging to return to normal activities. The sensitivity may also trigger or exacerbate headaches. While sunglasses can provide some relief from photophobia, wearing them all the time is not always a practical solution, nor is it pleasant for patients to live in a dark room for days at a time. A study from the University of Cincinnati, published in the *Journal of Athletic Training*, assessed the use of colored lenses in post-concussion patients and found wearing certain color-tinted sunglasses may be a good alternative to dark sunglasses.



Frames with colored lenses were tested as a strategy for photophobia relief

“While sunglasses can provide some relief, they are not very practical indoors or in low light environments,” says Joe Clark, PhD, professor in the Department of Neurology and Rehabilitation Medicine at the College of Medicine and lead author of the study. “What is needed is a light mitigation strategy that can be readily employed indoors, which can optimize relief in those who suffer from photophobia, or light sensitivity.”



Dr. Joe Clark

Dr. Clark and researchers at the College of Medicine assessed visual symptoms of 51 concussion patients and used frames with varying colored lenses to find out if certain hues provided relief from photophobia. “We found that 85 percent of patients reporting photophobia had relief of the symptoms with

one or more colors— blue, green, red and purple—with no reported adverse events,” Dr. Clark says.

“Sensitivity to light can be common and impact activities of daily life suggesting that light mitigation might improve quality of life in many of these patients. Photophobia is a common symptom for patients following traumatic brain injury. Our goal in this study was to provide medical

staff like athletic trainers with a method and means to assess and subsequently provide relief to an athlete who may be experiencing symptoms of photophobia,” Dr. Clark adds. The goal is to help the concussion patient feel better as the brain heals. “We compare the colored glasses to being like a brace or cast but for the brain,” he says. “It is temporary but prevents further injury or pain.”

At least 3.8 million people in the United States

sustain a concussion or traumatic brain injury every year, many not for the first time. Photophobia is so common that many neurosurgical intensive care units consider it standard operating procedure to keep lights dimmed in rooms containing TBI patients, says Dr. Clark.

Researchers noted, however, they do not recommend wearing colored glasses while driving. Certain colors make seeing stop lights or emergency vehicle lights difficult.

“We believe that an athletic trainer, in consultation with team physicians, may find it useful to apply this photophobia assessment and recommend colored glasses to his or her athlete,” Dr. Clark says. “The use of the colored glasses in the high school, college or other setting can allow a person to engage in some medically approved activities, while minimizing the risk of symptom exacerbation. We believe the use of the colored glasses that provide photophobia mitigation has added benefits superior to dark sunglasses, especially for indoor lighting.” •

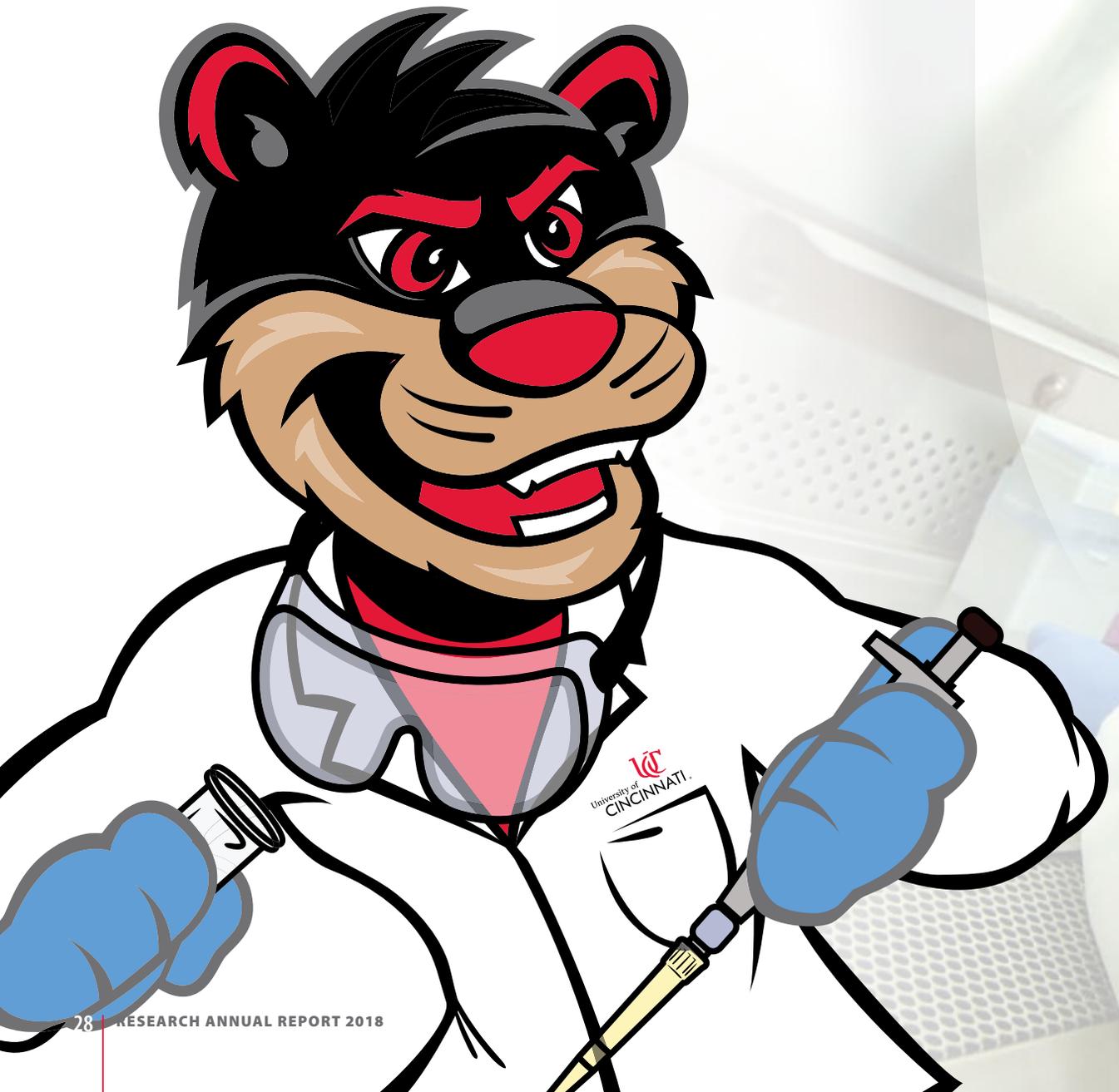
Additional researchers on the study include Jon Divine, MD, a professor in the Department of Orthopaedic Surgery at the College of Medicine and head team physician for University of Cincinnati Athletics.

- **Photophobia is a common symptom following concussion or mild traumatic brain injury (TBI)**
- **Assessed 51 concussion patients wearing varying colored lenses for photophobia relief**
- **Found 85 percent had relief with no adverse events**
- **Use of colored lenses can allow a person to engage in some activities, while minimizing symptom exacerbation**
- **3.8 million people in the U.S. sustain a concussion or TBI every year**
- **Published in the *Journal of Athletic Training***

**Frequency and Percentage of Relief From Photophobia by Color (n=33)**

Color	Frequency (Percentage) <sup>a</sup>
Blue	15 (45)
Green	10 (30)
Red	9 (27)
Purple	9 (27)
Magenta	4 (12)
Indigo	4 (12)
Violet	3 (9)
Aqua	3 (9)
Orange	2 (6)
Rose	2 (6)
Pink	2 (6)

<sup>a</sup> Multiple colors often provided relief. Yellow provided no relief.



A photograph of a person in a white lab coat and glasses, viewed from the side, working in a laboratory. The image is overlaid with a semi-transparent red filter. The person is looking down at their work. The background shows laboratory equipment and a clean, professional environment.

# CLINICAL TRIALS

## Study Finds Cannabidiol Reduced Seizures in Young Adults

**W**hile discussions swirl around the largely untested benefits of medical marijuana and state-by-state policies, one medication derived from the marijuana plant is on its own trajectory. Now in a third published study of patients with rare seizure disorders, Epidiolex, a pure cannabidiol (CBD) oral solution with no THC, has been found to significantly reduce the frequency of drop seizures, a type of seizure that causes sudden loss of muscle strength. Published in the *New England Journal of Medicine*, the study comes following the drug unanimously being passed a Food and Drug Administration advisory panel.



Michael Privitera, MD

The multi-center trial, which included the University of Cincinnati Medical Center, looked at the effectiveness of two dose levels of pure cannabidiol in reducing the frequency of drop seizures in patients who have Lennox-Gastaut syndrome (LGS)—a severe, yet rare form of epilepsy with an incidence of approximately two cases per 100,000 population.

“This trial involving children and adults with LGS showed that a pharmaceutical formulation of purified cannabidiol, resulted in a significantly greater reduction in the

frequency of drop seizures than in placebo,” says Michael Privitera, MD, professor of neurology and rehabilitation medicine, director of the Epilepsy Center at the UC Gardner Neuroscience Institute and a co-author on the study.

In study participants, the average (median) seizure frequency dropped by 41.9 percent in the group that received 20 mg of cannabidiol and a 37.2 percent drop in seizure frequency in the group receiving 10 mg (compared to placebo results at just 17 percent).

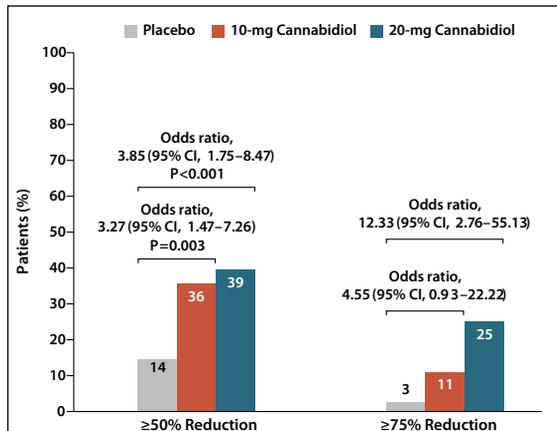
A total of 225 patients (12 in Cincinnati) participated across 30 centers in the randomized, double-blind, placebo controlled trial; overall, 6 percent (13 patients) discontinued due to adverse events. The most common adverse events cited among patients was drowsiness/sleepiness, decreased appetite and diarrhea. Abnormal liver function tests were seen in 9 percent of participants but were reversible in all cases.

Dr. Privitera, who has been researching anti-seizure medication for 30 years, says this is a historic study. “The field has been waiting for rigorous, scientific evidence that cannabidiol is effective and safe for epilepsy,” he adds. “This study puts those doubts to rest.”

The FDA followed the advisory panel’s recommendation by approving Epidiolex in June 2018 as the first cannabis-derived prescription medicine available in the U.S. There are other drugs on the market made from synthetic versions of THC or other compounds found in the plant. •

The trial was funded by GW Pharmaceuticals, manufacturer of Epidiolex.

- Looked at effectiveness of two dose levels of pure cannabidiol (no THC) in reducing frequency of drop seizures in Lennox-Gastaut syndrome patients
- Randomized, double-blind, placebo controlled trial of 225 children and adults across 30 centers
- Findings show a significantly greater reduction in the frequency of drop seizures with cannabidiol than with placebo
- Published in the *New England Journal of Medicine*



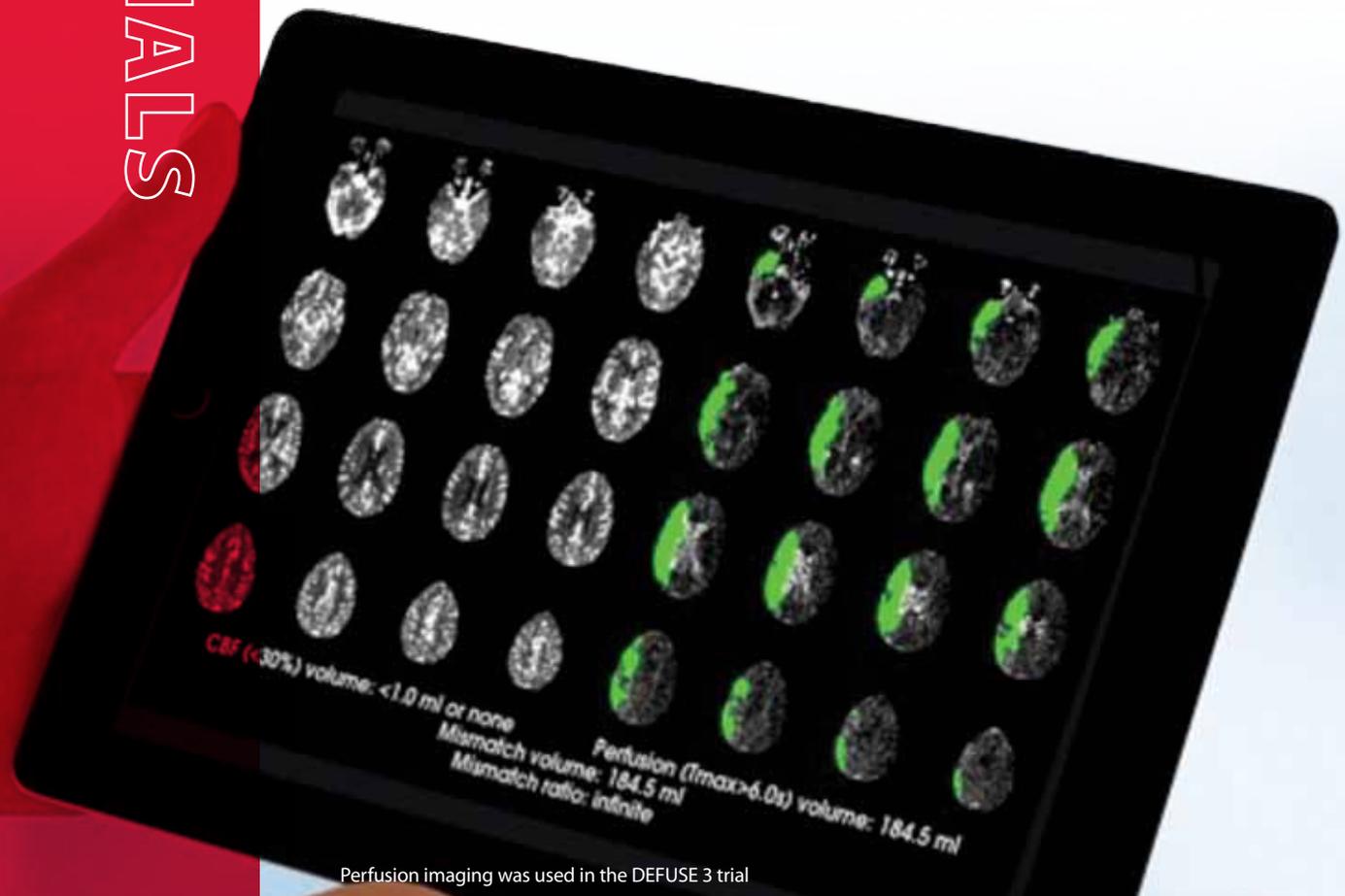
**Reductions of at Least 50% and 75% from Baseline in Drop-Seizure Frequency during the Treatment Period.**

The odds ratios are for the comparisons between each cannabidiol group and the placebo group. The P values were calculated with the use of a Cochran–Mantel–Haenszel test, with stratification according to age group (2 to 5 years, 6 to 11 years, 12 to 17 years, and 18 to 55 years). P values for reductions of at least 75% from baseline in drop-seizure frequency are not shown because this was not a key secondary outcome, and type 1 error was not controlled.

Effect of Cannabidiol on Drop Seizures in the Lennox–Gastaut Syndrome  
[https://www.nejm.org/doi/full/10.1056/NEJMoa1714631?query=featured\\_home](https://www.nejm.org/doi/full/10.1056/NEJMoa1714631?query=featured_home)

## Brain-Scan Guided Emergency Stroke Treatment Can Save More Lives

Advances in brain imaging can identify a greater number of stroke patients who can receive therapy later than previously believed, a study co-led by researchers at the College of Medicine found. The results of the “Endovascular Therapy Following Imaging Evaluation for the Ischemic Stroke (DEFUSE 3)” trial, presented at the International Stroke Conference 2018 in Los Angeles and published in the *New England Journal of Medicine*, demonstrated that physically removing brain clots up to 16 hours after symptom onset in selected patients led to improved outcomes compared to standard medical therapy.



Perfusion imaging was used in the DEFUSE 3 trial

The large, multi-site study was funded by the National Institute of Neurological Disorders and Stroke (NINDS), part of the National Institutes of Health (NIH), and supported by NINDS' StrokeNet, a network of more than 200 hospitals providing research infrastructure for multi-site clinical trials.

"DEFUSE 3 is wonderful example of the power and teamwork of this national network," says Joseph Broderick, MD, a co-author on the study as principal investigator for the National Coordinating Center for StrokeNet at UC and professor and director of the UC Gardner Neuroscience Institute. "This is the first acute stroke trial that was initiated by StrokeNet and the results of this NIH trial will dramatically change the practice of acute stroke therapy."

"These striking results will have an immediate impact and save people from life-long disability or death," added Walter Koroshetz, MD, director NINDS. "I really cannot overstate the size of this effect."

This study was conducted

at 38 centers across the U.S. and was ended early by the NIH on recommendation of the independent Data and Safety and Monitoring Board because of overwhelming evidence of benefit from the clot removal procedure.

Ischemic stroke occurs when a cerebral blood vessel becomes blocked, cutting off the delivery of oxygen and nutrients to brain tissue. Brain tissue in the immediate area of the blockage, known as the core, cannot typically be saved from dying, and it can enlarge over time. Over



Dr. Joseph Broderick

the past two decades, scientists have been working to develop brain scanning methods, called perfusion imaging, that could identify patients with brain tissue that can still be salvaged by removing the blockage.

Using an automated software known as RAPID to analyze perfusion MRI or CT scans, the DEFUSE 3 researchers identified patients thought to have salvageable tissue up to 16 hours after stroke onset. The participants were randomized to either receive endovascular thrombectomy plus standard medical therapy or medical therapy alone. Endovascular thrombectomy, or the physical removal of the blockage,

is currently approved for use up to six hours following onset of stroke symptoms.

The DEFUSE 3 researchers discovered that this intervention can be effective up to 16 hours after symptoms begin in this select group of patients. The findings showed that patients in the thrombectomy group had substantially better outcomes 90 days after treatment compared to those in the control group. For example, 45 percent of the patients treated with the clot removal procedure achieved functional independence compared to 17 percent in the control group. In addition, thrombectomy was associated with improved survival: 14 percent of the treated group had died within 90 days of the study, compared to 26 percent in the control group.

"While every minute counts when it comes to starting stroke treatment, DEFUSE 3 demonstrates that patients who have imaging evidence of salvageable brain can benefit from thrombectomy beyond six hours from onset, which was the previously recommended time window based upon prior thrombectomy trials," Dr. Broderick says. "DEFUSE 3 is a great example of how governmental investment of tax dollars into clinical research can dramatically improve outcomes of patients with stroke." •

This work was supported by the NINDS (NS086487, NS092076).

- **Endovascular thrombectomy is currently approved for up to six hours following onset of stroke symptoms**
- **Researchers identified candidates thought to have salvageable tissue using automated software analysis of perfusion imaging**
- **Showed endovascular thrombectomy up to 16 hours after symptom onset in select patients led to improved outcomes**
- **Ended early with overwhelming evidence of benefit**
- **Published in the *New England Journal of Medicine***

## First Patient Treated with Next Generation Immunotherapy at UC

The first patient in a national phase 1 clinical trial looking at a next-generation individualized cancer therapy which harnesses the patient's own immune system to attack cancer was treated May 1, 2018, at the University of Cincinnati Medical Center. The therapy was administered to Josh Minton, 30, of Aberdeen, Ohio, to determine the safety and efficacy of the treatment.



John Morris, MD

Ross Ristagno, MD, associate professor in the Department of Radiology and section chief of Interventional Radiology for UC Health, administered the treatment to Minton.

EpicentRx, a San Diego biotechnology company, developed

the vaccine which involves use of a virus to potentially infect and kill cancer cells in various cancer types. These viruses are tailored to the tumors of individual patients.

“We are able to biopsy a tumor and sequence its genome to find what is making that specific tumor cancerous. Samples of the patient’s tumors and normal DNA from blood undergo whole-exome sequencing to reveal mutations present only in the tumor,” says Corey Carter, MD, CEO of EpicentRx and former oncologist with Walter Reed National Military Medical. “We then are able to create viruses—biological agents that reproduce inside the cells of living hosts—based on knowledge gained from this sequence to replicate peptide fragments, or chemical reactions, and neoantigens, which are cancer-specific antigens, to stimulate the patient’s

immune cells to infiltrate and attack the cancer cells.

“Viruses naturally target and kill cancer cells and

these personalized viruses, which are derived from viruses that cause the common cold, have been engineered to improve on that ability since they use the machinery of the cancer cell

to produce thousands of copies of themselves and the neoantigens that they are carrying. Hence, these viruses are administered with the goal of training the immune system to seek out and destroy the cancer cells that display these neoantigens.”

Patients receive this treatment using image-guided needle injections into individual lymph nodes, says Ristagno.

“It’s a very precise procedure using CT and ultrasound guidance,” Dr. Ristagno says. “We did a biopsy of Josh’s lymph node and then slowly injected the virus through a needle deep into the lymph node. Josh tolerated the procedure extremely well. It is a challenging procedure; this time, we injected the virus through a lymph node in his neck. For the next treatment, we will inject the virus into a lymph node next to his aorta.”



Dr. Ross Ristagno

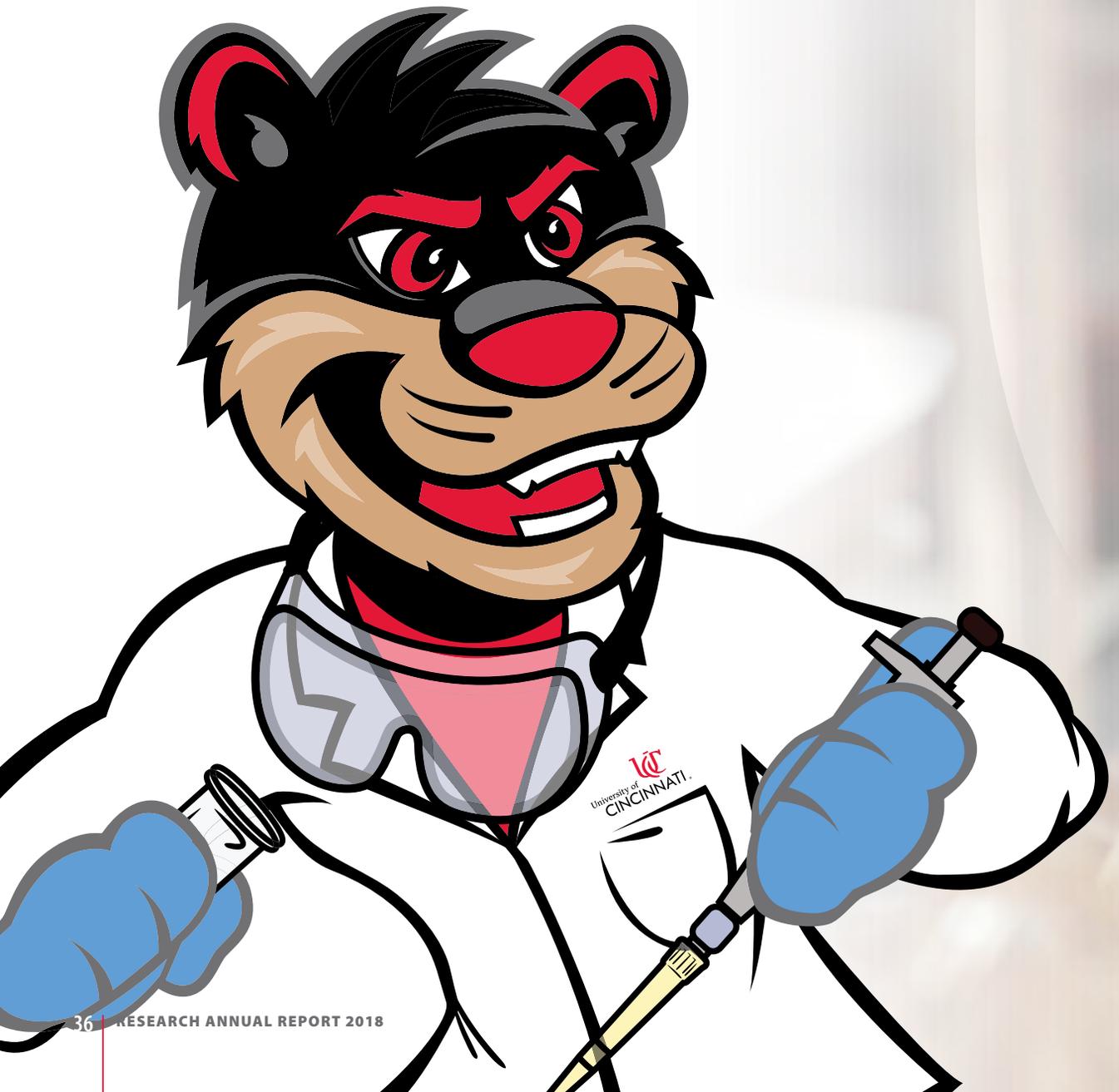
The federal Food and Drug Administration granted a special compassionate use exemption to treat Minton.

John Morris, MD, professor of medicine and director of the UC Cancer Institute’s Phase 1/ Experimental Therapeutics Program, is leading the local trial and says it is promising in the field of immunotherapy.

“The reality is that other immunotherapies only benefit 20 to 25 percent of patients in selected tumor types,” Dr. Morris says. “No two cancer cells are exactly alike, making it difficult to target cancer cells with drugs that inhibit one receptor or even one pathway since the cancer cells may and often do vary with respect to genetic changes and survival mechanisms. This personalized viral vaccine has the ability to express many different neoantigens from the tumor, targeting multiple genetic mutations in tumor cells, which could potentially prevent the cancer cells from sidestepping the immune system.” •

The virus used was manufactured at the EpicentRx facility in La Jolla, California, according to Good Manufacturing Practice regulations.

- Virus created based on patient-specific tumor genome sequencing
- Personalized viral vaccine able to express many different neoantigens from the tumor, potentially preventing cancer cells from sidestepping the immune system
- Treatment procedure uses image-guided needle injection
- First patient in a national phase 1 clinical trial





# OUTCOMES RESEARCH

## UC Study Finds Direct Oral Anticoagulants May Help Some AF Patients

Researchers at the College of Medicine have tested a computerized decision analytic model to determine the benefit an additional class of blood-thinners—direct oral anticoagulants (DOACs)—has for patients with atrial fibrillation. DOACs include four new drugs—rivaroxaban, apixaban, dabigatran and edoxaban—and are now used along with warfarin, a standard medication, for treating atrial fibrillation (AF) patients at UC Health, the affiliate health care system of the College of Medicine.



Mark Eckman, MD

The research team used the decision analytic model to review the medical data of 5,121 adults with nonvalvular atrial fibrillation seen in the UC Health system between January and December 2016 and found that aggregate life expectancy would be improved by 1,508 quality adjusted life years (QALY), explains Mark Eckman, MD, Posey Professor of Clinical Medicine, UC Health physician, and lead study investigator.

The computerized analytic model is known as the Atrial Fibrillation Decision Support Tool (AFDST) and is integrated into UC Health's electronic health record system. AFDST predicted that patients who have a low risk of bleeding while on blood thinners and a moderate-to-high risk of stroke are the biggest potential beneficiaries while using DOAC therapies. They might see gains of up to 1.8 QALYs by receiving appropriate blood-thinning therapy now that DOACs are available.

The findings were published in the *American Heart Journal*.

AFDST uses the patient's age, gender and history of stroke or bleeding, along

with whether the individuals had vascular disease, a history of myocardial infarction, alcoholism, intracranial hemorrhage, hypertension, congestive heart failure, diabetes, abnormal liver and other health ailments. The model assigns points based on these characteristics and offers a recommendation along with guidelines on treatment of atrial fibrillation from the American College of Cardiology/American Heart Association/Heart Rhythm Society. AFDST has been in use for about two years and now includes DOAC therapies.

When DOACs are a therapeutic option, the AFDST recommended oral anticoagulant therapy for 4,134 patients (81 percent) in the study and no antithrombotic therapy or aspirin for 489 patients (9 percent). When warfarin was the only option, oral anticoagulant therapy was recommended for 3,228 patients (63 percent) and no antithrombotic therapy or aspirin for 973 patients (19 percent). Overall, 1,508 QALYs could be gained were treatment changed to that recommended by the AFDST, according to team's published findings.

Dr. Eckman says clinical trials have found that the four DOACs are as good as warfarin, a medication long used for treating AF and stroke. "In some cases they are even better in terms of stroke prevention," he says. "They really shine because of their lower risk of bleeding in the brain. The major side effect of all these anticoagulants is bleeding since their role is to thin the blood." •

Other faculty and staff in the College of Medicine or UC Health contributing to this research are: Alexandru Costea, MD, Mehran Attari, MD, Jitender Munjal, MD, Ruth Wise, Carol Knochelmann, Matthew Flaherty, MD, Pete Baker, Robert Ireton, Brett Harnett, Anthony Leonard, PhD, Dylan Steen, MD, Adam Rose, MD, and John Kues, PhD.

The research was supported in part by a grant from the Heart Rhythm Society funded by Boehringer-Ingelheim Pharmaceuticals; and the National Institutes of Health/ National Center for Advancing Translational Sciences.

- Reviewed medical data of 5,121 adults with nonvalvular atrial fibrillation using a decision analytic model (Atrial Fibrillation Decision Support Tool, AFDST)
- Evaluated potential benefit of additional class of blood thinners—direct oral anticoagulants
- Found that aggregate life expectancy would be improved by 1,508 quality adjusted life years if treatment changed to that recommended by the AFDST
- Published in the *American Heart Journal*

## Bariatric Surgery Lowers Cancer Risk for Severely Obese Patients

**S**everely obese patients who undergo bariatric surgery lower their risk of developing cancer by at least a third, according to a UC College of Medicine researcher leading a large retrospective cohort study of patients in the western United States. "We found having bariatric surgery is associated with a reduced risk of cancer, especially obesity-associated cancers including postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer," explains Daniel Schauer, MD, associate professor in the UC Division of General Internal Medicine, UC Health physician, and lead researcher. "What's surprising is how great the risk of cancer was reduced."



Daniel Schauer, MD

The findings were recently published online in the *Annals of Surgery*.

The study reviewed medical data of 22,198 individuals who had bariatric surgery and 66,427 nonsurgical patients between 2005 and 2012 with follow-up through 2014. It pulled data from large integrated health insurance and health care delivery systems from five study sites operated by Kaiser Permanente—Southern California, Northern California, Oregon, Colorado and Washington.

More than 80 percent of patients in the study were women.

Patients undergoing bariatric surgery had a 33 percent lower risk of developing any cancer during follow-up, according to the published findings. Dr. Schauer, also a UC Health physician, says the benefit is greatest among obesity-associated cancers. The risk of postmenopausal breast cancer dropped by 42 percent while the risk for endometrial cancer dropped 50 percent in severely obese patients. The risk of colon cancer dropped 41 percent while the risk of pancreatic cancer was lowered by 54 percent.

“Cancer risks for postmenopausal breast cancer and endometrial cancer are closely related to estrogen levels,” says Dr. Schauer. “Having weight loss surgery reduces estrogen level.”

Bariatric surgery helps reduce the risk of diabetes and insulin levels which may be a risk factor for pancreatic cancer, while the mechanisms for colon cancer are more complicated, says Dr. Schauer.

“I think considering cancer risk is one small piece of the puzzle when considering bariatric surgery, but there are many factors to consider. Reductions in diabetes, hypertension and improvements in survival and quality of life are reason enough,” says Dr. Schauer. “The study provides an additional reason to consider bariatric surgery.”

The study found no significant association between bariatric surgery and cancer risk among men. Dr. Schauer says that may be because the vast majority of study patients are female and at least two of the cancers most impacted by bariatric surgery, postmenopausal breast cancer and endometrial cancer, affect women only.

Multivariable Cox proportional-hazards models were used to examine the incidence of cancer up to 10 years after bariatric surgery compared to the matched nonsurgical patients. After a mean follow-up of 3.5 years, researchers identified 2,543 incident cancers.

About 15 million adults in the United States suffer from severe obesity, which is defined as having a body mass index of greater than 35 kg/m<sup>2</sup>. Obesity and cancer are closely linked. Obesity is associated with up to 40 percent of all cancers diagnosed in the United States, says Dr. Schauer. •

Anthony Leonard, PhD, a biostatistician and research associate professor in the UC Department of Family and Community Medicine contributed to the study. Other researchers associated with Kaiser Permanente who participated in the study include Heather Spencer Feigelson, PhD, Corinna Koebnick, PhD, Bette Caan, DrPH, Sheila Weinmann, PhD, David Powers, Panduranga Yenumula, MD, and David Arterburn, MD.

The National Cancer Institute of the National Institutes of Health funded the study.

- Large retrospective cohort study of patients in the western U.S.
- Severely obese patients who undergo bariatric surgery have 33 percent lower risk of developing any cancer during follow-up
- Risk of postmenopausal breast cancer dropped by 42 percent and risk for endometrial cancer dropped 50 percent
- No significant association found between bariatric surgery and cancer risk among men
- Published in *Annals of Surgery*

## Enhanced Recovery Program for Colorectal Surgery Patients Reduces Costs

**A** standardized protocol for managing patients immediately before, during and after colorectal operations not only improved clinical outcomes, but also it significantly reduced overall hospital costs, a UC-led study shows.



Ian Paquette, MD

This study, one of the first to investigate hospital costs associated with an enhanced recovery pathway for colorectal patients, was published in advance of print publication in the *Journal of the American College of Surgeons*.

“The enhanced recovery protocol provides clinical benefit by getting surgical patients to recover quicker, use less narcotic medication, and have a smoother recovery that gets them out of the hospital and hopefully back to work faster. This study shows there is financial benefit from using the standardized pathway as well,” says study author Ian Paquette, MD, an associate professor of surgery at the College of Medicine, a surgeon with UC Health and corresponding author of the study.

Guidelines for standardizing the care of colorectal surgery patients have been established by the American Society of Colon and Rectal Surgeons (ASCRS) and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). These guidelines were updated in 2017.

Previous studies have shown that these protocols

reduce overall complications and length of stay and improve patient satisfaction. The studies have focused on clinical aspects of care, rather than cost, or they involved estimations of the cost of following a standardized protocol. This is one of the first published studies to detail the effect on cost of implementing a pathway for colorectal surgery patients.

For this study, researchers compared outcomes and costs for two groups of patients: 160 patients who underwent colorectal procedures one year before an enhanced recovery program was instituted in 2016 and 146 patients who had procedures in the year following universal adoption of the program. Patients in the study underwent operations to treat diverticulitis, colon polyp removal, cancer, inflammatory bowel disease or prolapse. The enhanced recovery program standardized preoperative bowel preparation, fluid management, pain control, early ambulation and return to a normal diet.

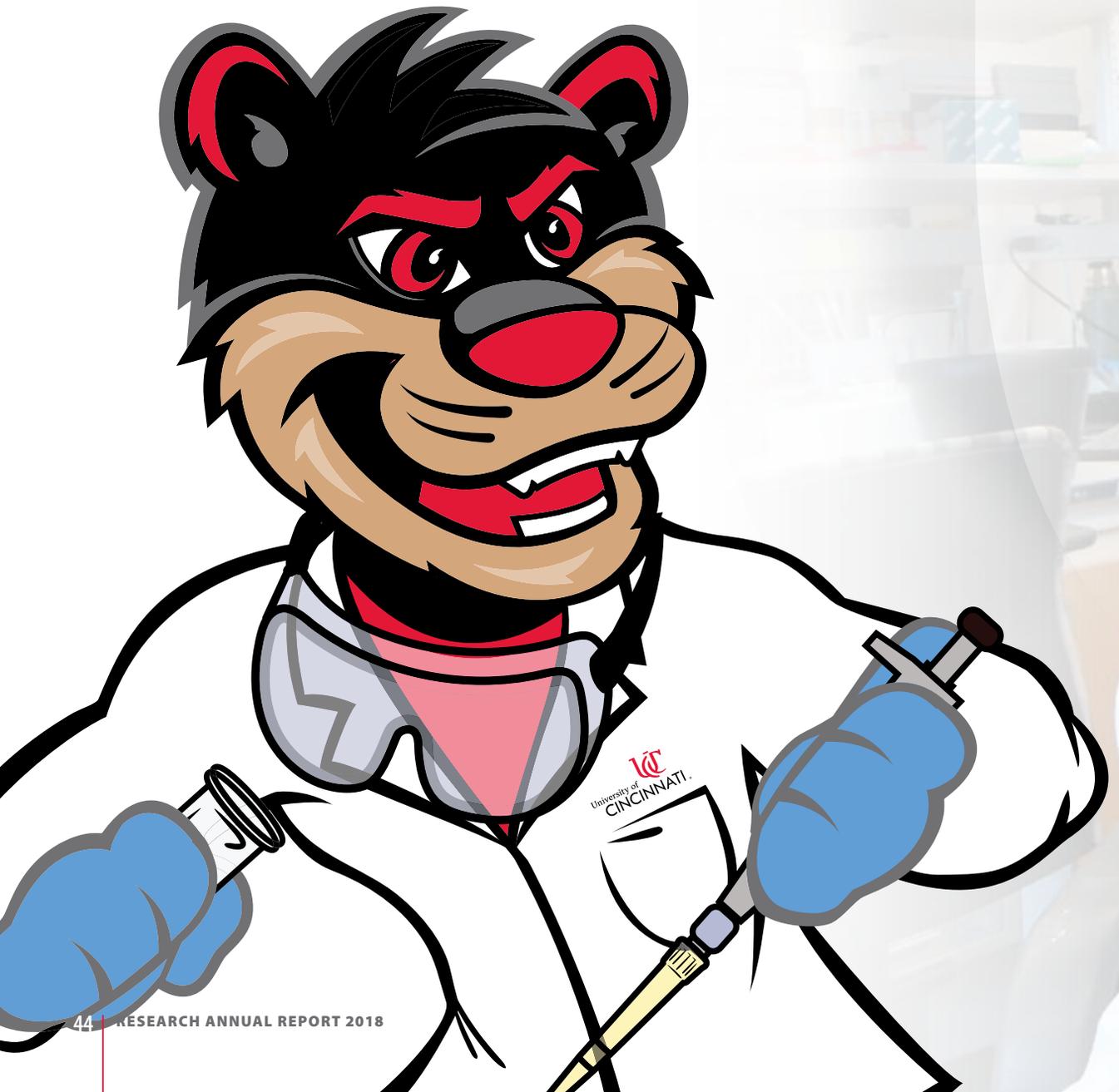
The study found that the hospital length of stay was two days shorter for patients in the enhanced recovery

group. Fewer patients in this group had lack of normal bowel function (6 percent vs. 20 percent). These patients were able to discontinue pain medication one day after surgery, compared with three days post-surgery for patients in the other group and reduce narcotic use. Patients in the enhanced recovery program required 212 morphine equivalent units; patients in the other group required 720 morphine equivalent units.

Total direct hospital costs were \$1,717 lower per patient in the enhanced recovery group, which translates into an annual savings of more than \$250,000. Daily pharmacy costs per patient were higher (\$477 vs. \$318). However, total pharmacy costs were \$325 less in the enhanced recovery group.

“The evidence is overwhelming that enhanced recovery pathways lead to a better recovery, get patients back to a normal lifestyle in a quicker manner, and minimize the amount of narcotics, which may help with the ongoing opioid epidemic. This study shows they also lower hospital costs,” Dr. Paquette says. •

- Existing studies of established colorectal surgery patient protocol focused on clinical outcomes or used estimated costs
- One of first published studies to detail cost of protocol implementation
- Results confirmed beneficial clinical outcomes as well as total direct hospital costs \$1,717 lower per patient
- Published in the *Journal of the American College of Surgeons*





**COMMUNITY IMPACT**

## Higher Manganese Levels in Children Correlate With Lower IQ Scores, UC Study Finds

A study led by environmental health researchers at the College of Medicine finds that children in East Liverpool, Ohio, with higher levels of manganese (Mn) had lower IQ scores. The research appears in the journal *NeuroToxicology*. The study analyzed blood and hair samples of 106 children 7 to 9 years of age from East Liverpool and surrounding communities, who enrolled in the study from March 2013 to June 2014. Working with a trained registered nurse from East Liverpool, participants and their caregivers were also given cognitive assessments and questionnaires at the time the samples were taken.



Along with Erin Haynes, DrPH (*far right*), Department of Environmental Health, the East Liverpool, Ohio, community team included (*far left*) the late Roxanne Burns, PhD, Kent State University East Liverpool campus; Amy Sigley, RN; and Delores Silverthorn, RN.

The study found that increased Mn in hair samples was significantly associated with declines in full-scale IQ, processing speed and working memory.

Manganese is an element generally found in combination with iron and many minerals. It plays a vital role in brain growth and development, but excessive exposure can result in neurotoxicity. Manganese is used widely in the production of steel, alloys, batteries and fertilizers and is added to unleaded gasoline.

Erin Haynes, DrPH, professor in the Department of Environmental Health and lead author of the study, was approached by East Liverpool school district officials in 2013, prompted by concerns of students' academic performance, paired with the knowledge that Mn concentrations in the area have exceeded U.S. Environmental Protection Agency (EPA) reference levels for more than a decade.

"There are socio-economic issues at play, however, they are also compounded by potentially significant environmental exposures," says Dr. Haynes, who collaborated with the Kent State East Liverpool Campus and the community group Save Our County Inc., formed in 1982 by

East Liverpool residents in response to the proposed construction of a hazardous waste incinerator in their community. "Children may be particularly susceptible to the neurotoxic effects of ambient Mn exposure, as their brains are undergoing a dynamic process of growth and development."

After concerns of elevated airborne levels of Mn, the school district superintendent in East Liverpool requested testing students for manganese along with neuropsychological tests. A pilot study overseen by Dr. Haynes found levels of Mn at double the amount in children from a different Communities Actively Researching Exposure Study (CARES) cohort near Marietta, Ohio, and further investigation was pursued to examine the association between Mn exposure and child cognition.

Located in northeast Ohio along the Ohio River, East Liverpool has a demonstrated history of environmental exposures, with EPA records showing elevated levels of manganese concentrations since 2000. In 2005, East Liverpool was deemed by the EPA to be a potential environmental justice area, afflicted with major environmental exposures, and a 2010 EPA report noted manganese

concentrations detected by all monitors in East Liverpool had "consistently exceeded" health-based guidelines set by the agency.

With a declining population of 11,000, just 7.3 percent of East Liverpool residents have a college degree. The East Liverpool school district reports a higher than average percentage of students in special education (19 percent) versus the Ohio state average of 13 percent. •

The study also included researchers from Cincinnati Children's Hospital Medical Center, Icahn School of Medicine at Mount Sinai, University of Albany, New York State Department of Health and the late Roxanne Burns, PhD, chair of the biology department at Kent State University East Liverpool Campus.

This research was supported by the National Institute of Environmental Health Sciences (R01ES016531, R21ES021106, and P30-ES06096) and NIH/NCRR8UL1TR000077.

- **Study area (East Liverpool, OH) has manganese (Mn) concentrations exceeding U.S. EPA guidelines**
- **Local school district reports 19% of students in special education (state average is 13%)**
- **Analysis of blood and hair samples and cognitive assessment of 106 children, age 7 to 9 years, during the study period**
- **Increased Mn in hair sample significantly associated with declines in full-scale IQ, processing speed and working memory**
- **Published in *NeuroToxicology***

## High Levels of PFOA Found in Mid-Ohio River Valley Residents 1991 to 2013

New research from UC reveals that residents of the Mid-Ohio River Valley (from Evansville, Indiana, to Huntington, West Virginia) had higher than normal levels of perfluorooctanoic acid (PFOA) based on blood samples collected over a 22-year span. The exposure source was likely from drinking water contaminated by industrial discharges upriver. The study, appearing in *Environmental Pollution* September 2017, looked at levels of PFOA and 10 other per- and polyfluoroalkyl substances (PFAS) in 931 Mid-Ohio River Valley residents, testing blood serum samples collected between 1991 and 2013, to determine whether the Ohio River and Ohio River Aquifer were sources of exposure. This is the first study of PFOA serum concentrations in U.S. residents in the 1990s.



Susan Pinney, PhD

“These Mid-Ohio River Valley residents appear to have had concentrations of PFOA in their bloodstream at higher than average U.S. levels,” says Susan Pinney, PhD, professor in the Department of Environmental Health at the College of Medicine, a member of both the Cincinnati Cancer Consortium and UC Cancer Institute and senior author of the study.

Ohio River PFOA concentrations downstream were elevated, suggesting Mid-Ohio River Valley residents were exposed through drinking water, primarily contaminated by industrial discharges as far as 666 kilometers (413 miles) upstream. Industrial discharges of PFOA to the Ohio River, contaminating water systems near Parkersburg, West Virginia,

were previously associated with nearby residents’ serum PFOA concentrations above U.S. general population medians.

The article notes that use of granular activated carbon filtration (GAC) by water treatment facilities reduced PFOA exposure by as much as 60 percent.

“Where GAC has been used, the blood level concentration of PFOA was decreased significantly,” says co-author Robert Herrick, a UC doctoral student in the Department of Environmental Health.

Nearly all of the samples tested positive for some level of PFOA (99.9%) but 47 percent of the samples had PFOA levels higher than the 95th national percentile.

The study additionally looked at information about municipal water distribution systems and the zones that

were serviced by each of the water treatment plants.

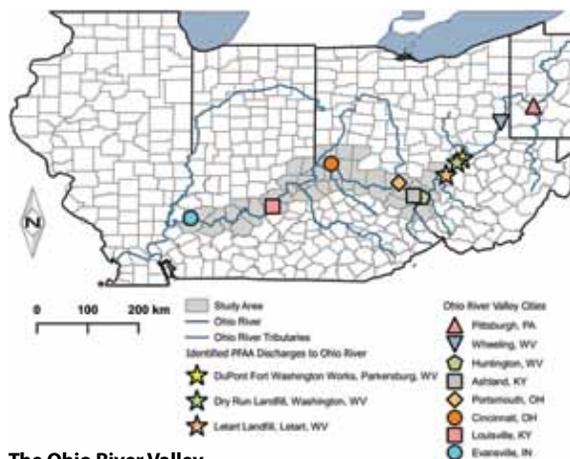
“We conducted statistical analyses to determine if factors such as location and years of residence, drinking water source and breast feeding were predictors of the person’s serum perfluorocarbon (PFC) concentration,” says Herrick.

Dr. Pinney points out that the primary concern with PFCs/PFOA is that they take a very long time to leave the human body, and studies indicate that exposure to PFOA and PFAS over certain levels may result in adverse health effects, including developmental effects, liver and tissue damage and immune and thyroid impacts.

Dr. Pinney cites projects like this one as having the translational potential to make improvements in public health. “Studies like these provide evidence to support changes in water treatment practices.” •

The Mid-Ohio River Valley study was made possible by the Breast Cancer and the Environment Research Program awards U01ES012770 and U01ES019453 from the NIEHS and the National Cancer Institute; P30-ES006096, R21 ES017176 and T32-ES10957 from NIEHS; EPA-RD-83478801 from the United States Environmental Protection Agency, and CSTAUL1RR026314 from the National Center for Research Resources.

- Analysis of blood serum samples collected between 1991 and 2013 from residents of Mid-Ohio River Valley for perfluorooctanoic acid (PFOA) and 10 other per- and polyfluoroalkyls
- 99.9% tested positive for some level of PFOA
- 47% had PFOA levels higher than the 95th national percentile
- Exposure source was likely drinking water contaminated by industrial discharges upriver
- Published in *Environmental Pollution*

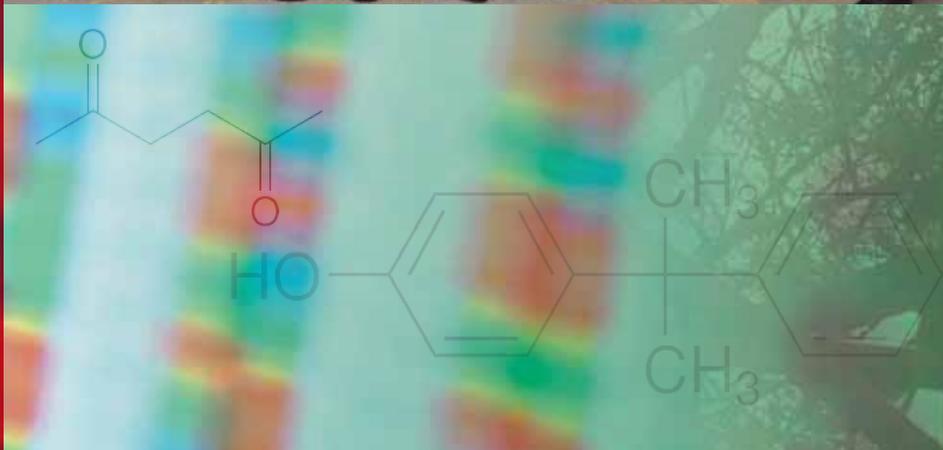


### The Ohio River Valley

Polyfluoroalkyl substance exposure in the Mid-Ohio River Valley, 1991–2012  
<https://www.sciencedirect.com/science/article/pii/S0269749117301264>

## UC Awarded \$8 Million to Continue 'Gene-Environment Interaction' Research

The Center for Environmental Genetics (CEG) at UC has received a grant renewal for more than \$8 million from the National Institutes of Health's National Institute of Environmental Health Sciences (NIEHS), over the next five years, taking the Center into its 30th year of continual funding. "This realm of epigenetics continues to be so important, as we learn more about health and disease as a continuum—we are finding that disease risk is laid down very early in life, even in preconception," says Shuk-mei Ho, PhD, CEG director and Jacob G. Schmidlapp professor and chair of the Department of Environmental Health.



“The CEG is known for the quality, quantity and uniqueness of exposure data—not only regionally, but nationally and internationally,” says Dr. Ho. The CEG’s core facilities, technologies and rich datasets help facilitate innovative research, focused on how environmental agents interact with genetic and epigenetic factors to influence disease

risk and outcomes. “We have 11 human cohort studies, all with substantial exposure data, which makes the CEG unique, and sharing these resources is important to the NIEHS,” says Susan Pinney, PhD, professor and deputy director of the CEG. Founded in 1992 by Daniel Nebert, MD, now a UC professor emeritus

of environmental health, the center is one of 20 Environmental Health Sciences (EHS) Core Centers funded by the NIEHS (P30 ES006096.) The new award will be disbursed in annual increments of about \$1.6 million through March 31, 2022. Collectively, CEG members hold \$350 million in funding for UC and Cincinnati Children’s. •

The CEG is composed of four primary core areas:

**Bioinformatics Core:** Led by Mario Medvedovic, PhD and Jarek Meller, PhD, both professors in the Department of Environmental Health, this core helps researchers collect and organize data on how proteins function in the body and understand how that information might translate into new targets for drug development. The team also helps researchers design and analyze gene-expression experiments and understand the biological implications of results.

**Integrative Technologies Core:** Led by Ricky Leung, PhD, assistant professor of environmental health, and Dr. Ho, this core offers specialized services and expert consultation in facilities such as genomic and sequencing cores, transgenic mouse construction, genotyping, proteomics, high-field magnetic resonance imaging and spectroscopy, flow cytometry and mass spectrometry-based detection of metal ions.

**Integrative Health Sciences Core:** Led by Dr. Pinney and Aimin Chen, MD, PhD, professor of environmental health, this core supports human studies of environmental exposures and disease and promotes translation of research findings to physicians and community members. The core guides CEG members through designing epidemiologic research studies, especially with methods of quantifying exposures, to build capacity for research that integrates basic with clinical research and public health.

**Community Engagement Core (CEC):** Led by Erin Haynes, DrPH, associate professor of environmental health and Nicholas Newman, DO, assistant professor of pediatrics, the CEC links research and investigators to community need. The CEC works to translate scientific research into practical health promotion, disease prevention information, tools and resources for community members, public health decision-makers and health care professionals. The CEC also listens to community concerns and builds scientific connections to address those needs. •

- UC’s Center for Environmental Genetics received \$8 million, five year grant renewal from NIEHS (through March 2022)
- 30th year of continual funding
- One of 20 Environmental Health Sciences Core Centers funded by the NIEHS
- CEG home to 11 human cohort studies
- Housed in the College’s Department of Environmental Health

Photo facing page: Leaders of CEG include (left to right): Nicholas Newman, DO; Mario Medvedovic, PhD; Erin Haynes, DrPH; Alvaro Puga, PhD; Susan Pinney, PhD; Shuk-Mei Ho, PhD; Yuet-Kin (Ricky) Leung, PhD; Aimin Chen, MD, PhD; Jagjit Yadav, PhD.  
Not pictured: Jarek Meller, PhD; Daniel Woo, MD; ChanChung Xie, PhD

## UC Emergency Medicine Team to Play Key Role in Opioid Intervention Program

A team from UC, led by Michael Lyons, MD, associate professor in the Department of Emergency Medicine at the College of Medicine, will play a major role in a first-of-its-kind naloxone access program and pilot study called the Hamilton County Narcan Distribution Collaborative. The program aims to increase the distribution of naloxone (in the form of Narcan, the nasal spray manufactured by Adapt Pharma) by more than 400 percent in an effort to reduce and prevent opioid-related overdose fatalities across Hamilton County.



Michael Lyons, MD

The collaborative effort is the result of a unique partnership between the Hamilton County Public Health Department (HCPH), Adapt Pharma, BrightView Health, Interact for Health and the College of Medicine. All five major health systems in the region are participating both clinically and financially.

“The ability of naloxone to reverse overdose and save lives is well-known,” said Dr. Lyons. “This particular project is expected to benefit from the expertise of our team at the University of Cincinnati in implementing new procedures in health care settings, combining health care and public health efforts in integrated programs and working to assess the impact of health interventions on populations.”

Dr. Lyons will lead a Department of Emergency Medicine research team that will analyze the HCPH naloxone distribution effort using existing data and determine whether there is any resulting change in overdose mortality. On the clinical side, the UC Early Intervention Program, led by Dr. Lyons and Andrew Ruffner, research associate

in the Department of Emergency Medicine, will collaborate with HCPH on how the program is implemented, particularly with respect to health care settings.

The Hamilton County Narcan Distribution Collaborative will build upon existing access strategies by distributing approximately 30,000 doses to new and current partners across the county in hopes of reducing by more than 50 percent the number of fatal overdoses and overdoses resulting in admission to intensive care units. Some of the new agencies that will be part of this program include hospital emergency departments, prisons and jails, syringe exchanges and faith-based groups.

“To the Hamilton County Health Department, the University of Cincinnati Emergency Medicine Department, BrightView Health—thanks for your collaboration on this project, as well as all those who made achieving this goal possible,” said Ohio Sen. Rob Portman by way of video. “Narcan is not the ultimate answer to this crisis. The ultimate answer is to get these people into treatment,

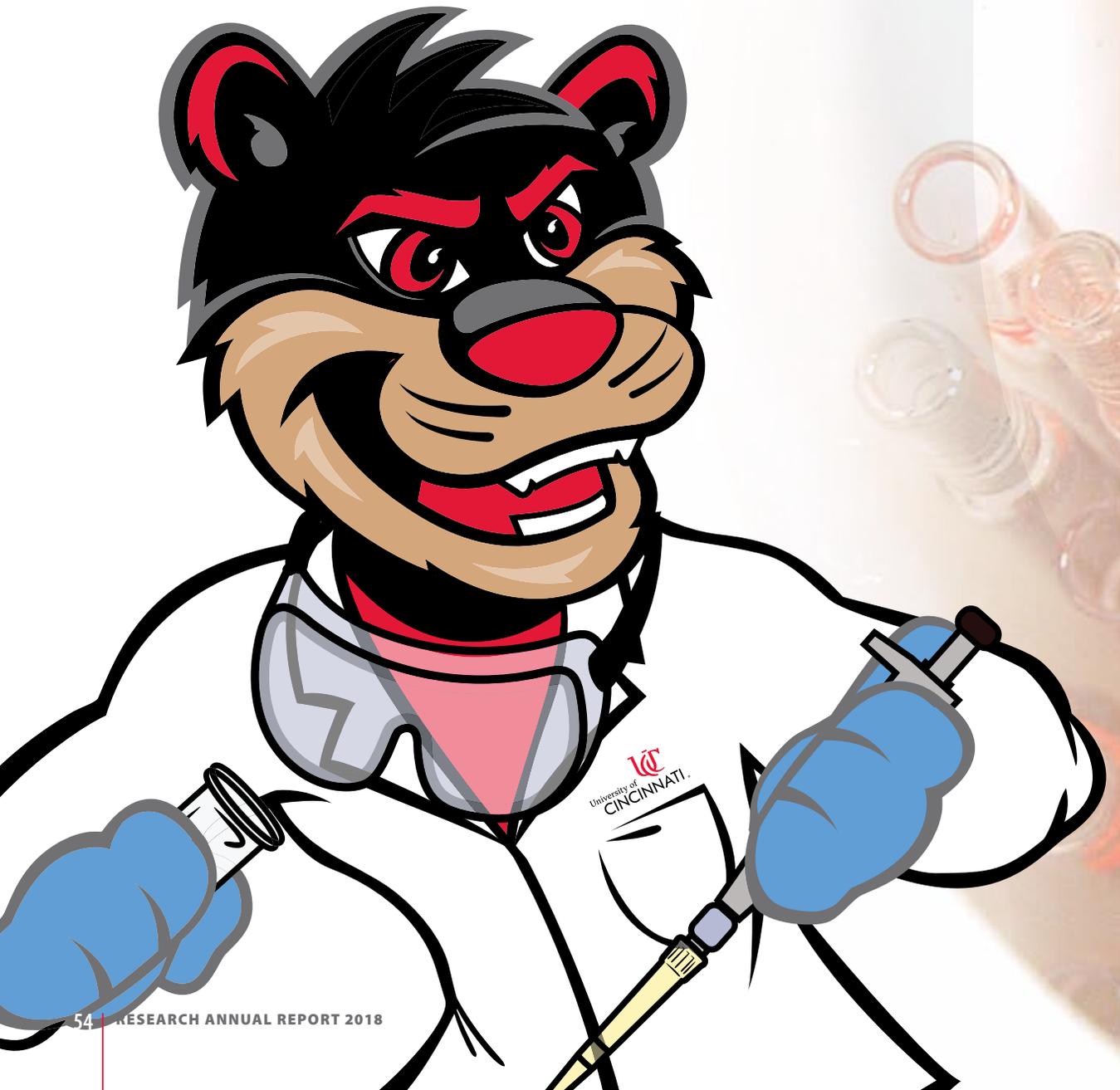
into longer-term recovery and back on their feet and I know everybody here today acknowledges that and understands that. In the meantime, we’ve got to save lives.”

According to the Hamilton County Coroner’s office, overdose deaths in Hamilton County have nearly doubled in the past four years.

The program is scheduled to run for two years. Naloxone doses will be distributed in locations in the county that have seen some of the highest rates of overdose, with the resulting data being collected about every three months.

“Through the research component led by Dr. Lyons at the UC College of Medicine, as the data comes in and it’s evaluated according to scientific rigors, we’ll know whether or not it becomes a best practice,” said Hamilton County Health Commissioner Tim Ingram. “This project is about saving lives, first and foremost, and perhaps can become a model that can be replicated throughout the country in the battle against the disease of opioid addiction.” •

- **Opioid-related overdose deaths in Hamilton County, Ohio, have nearly doubled in the past four years**
- **Naloxone reverses overdose**
- **Collaborative program aims to increase the distribution of naloxone (as Narcan, the nasal spray manufactured by Adapt Pharma)**
- **Goal is to reduce fatal overdoses and overdoses resulting in admission to intensive care units by more than 50 percent**
- **UC will lead research team analyzing data**





# BENCH TO BEDSIDE

## UC Researcher Just Got a Major Endorsement for her Cancer-preventing, Tanning Agent

**A** revolutionary formula with the power to prevent skin cancer, repair sun damage and tan skin is one step closer to market thanks to a \$65,000 gift from Melanoma Know More (MKM), a nonprofit dedicated to raising awareness about melanoma, the deadliest form of skin cancer. “The gift from MKM is a godsend. It’s going to allow our team to generate preliminary data that will allow us to test our agent in a clinical trial,” said Zalfa Abdel-Malek, PhD, a professor in the Department of Dermatology and leader of the research team responsible for the agent. “Hopefully with the data we collect, I can then seek long-term funding from the National Institutes of Health to move forward with our melanoma prevention plan.”



Zalfa Abdel-Malek, PhD

MKM's gift creates The Zalfa Abdel-Malek Melanoma Research Fund, which will allow other members of the community to support her team's work.

"It's clear that as treatments advance and change, it's important to support efforts in the community," said Leanne Marie Blair, executive director at MKM. "Dr. Abdel-Malek and her lab are on the cutting edge of change, and if we can make even a small impact on their work, that is extremely important and has the potential for global results."

In 2006, Dr. Abdel-Malek and her team were given \$1 million from the National Cancer Institute to develop a topical treatment that would not only make skin tan but would also work to block harmful ultraviolet (UV) rays and repair damage caused by sun exposure, which could lead to skin cancer.

Initial research conducted in collaboration with James Knittel, PhD, a former faculty member at UC's James L. Winkle College of Pharmacy, and Leonid Koikov, PhD, then a postdoctoral fellow, focused on the chemical modification of alpha-melanocyte stimulating hormone (alpha-MSH). Researchers were able to reduce alpha-MSH from 13 amino acids to four and then three to enhance its ability to target pigment-producing cells. Dr. Abdel-Malek's lab team found that not only did the alpha-MSH and these novel small derivatives increase skin pigmentation, but also repaired pre-cancerous damage from UV rays.

"The topical agent Zalfa and her team are working on essentially reverses the effects of sun exposure on DNA," said Susan Kindel, MD, a member of the MKM research committee that awarded the funds

to Dr. Abdel-Malek and her lab. "Because about 95 percent of melanoma are due to sun exposure, this is incredibly important. It was a no-brainer providing the funding to Zalfa, who is nationally recognized for her work."

Dr. Abdel-Malek, who is also a member of the UC Cancer Institute and Cincinnati Cancer Center, hopes the treatment will be available to the public before she retires. Until then, there's work to do.

"We're moving ahead," said Dr. Abdel-Malek. "As we generate more pre-clinical data, we can move forward with clinical trials. Because melanoma is the deadliest form of skin cancer and its incidence is increasing faster than any other type of cancer, our research is more important now than ever before to prevent this disease." •

- Melanoma is the deadliest form of skin cancer and its incidence is increasing faster than other cancers
- Researchers reduced alpha-melanocyte stimulating hormone (alpha-MSH) from 13 to three amino acids
- Modification enhances ability to target pigment-producing cells
- Alpha-MSH and these derivatives increase skin pigmentation and found to repair pre-cancerous damage from UV rays
- Nonprofit funds additional data collection moving to clinical trials

## UC Researcher Granted U.S. Patent for Potential COPD Treatment

A researcher in the College of Medicine has been granted a U.S. patent for a potential treatment for a pulmonary infection in patients with cystic fibrosis (CF) and chronic obstructive pulmonary disease (COPD). The treatment, known as AB569, was developed in the lab of Daniel Hassett, PhD, a professor in the Department of Molecular Genetics, Biochemistry and Microbiology. AB569 is a potential treatment for many antibiotic-resistant organisms including *Pseudomonas aeruginosa* (*P. aeruginosa*), which causes pulmonary infections.



Daniel Hassett, PhD (left), with graduate student Cameron McDaniel

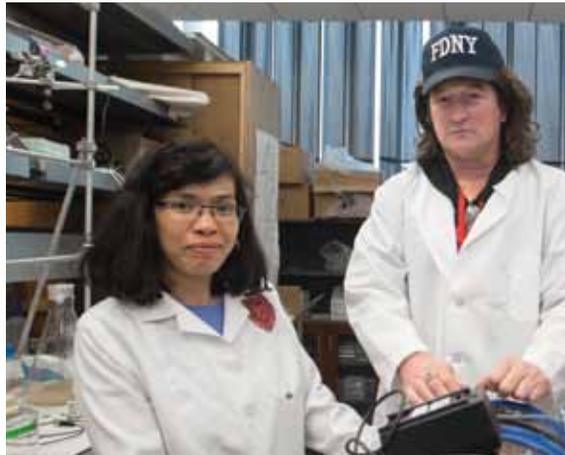
The drug has been licensed by the university exclusively to Arch Biopartners, a Toronto-based publicly traded biotechnology company. Dr. Hassett is a stockholder and principal scientist at Arch.

“This is some extremely positive and very timely news,” says Dr. Hassett. “AB569 can be a global game changer and has the potential to positively impact lives around the world.”

The U.S. Patent and Trademark Office issued patent #9,925,206 to the University of Cincinnati on March 27, 2018, on which Dr. Hassett is the inventor.

CF is a genetic disease that causes persistent lung infections and progressively limits the ability to breathe. In people with CF, a defective gene causes a buildup of thick, dehydrated mucus in the lungs, pancreas and other organs. There are about 40,000 CF patients in the U.S. and more than 70,000 worldwide.

Dr. Hassett’s earlier work on CF found that *P. aeruginosa* was susceptible to destruction by slightly acidified sodium nitrite. In his continued effort to combat CF and COPD, he



Research Associate Warunya Panmanee, PhD, with Dr. Hassett

discovered a synergistic effect by adding disodium ethylenediaminetetraacetic acid, which led to the development of AB569.

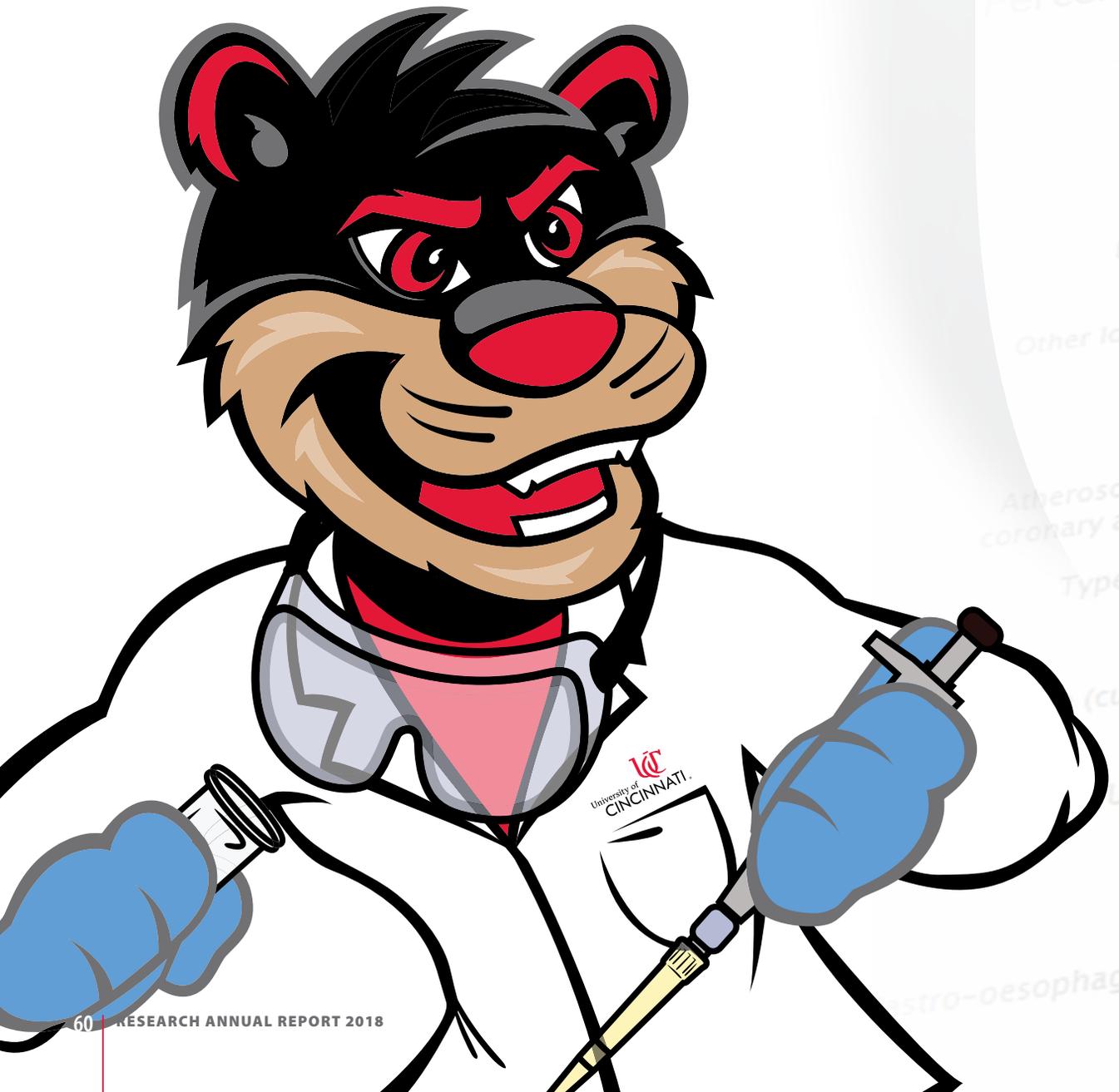
*P. aeruginosa* is a significant cause of bacterial respiratory infections in patients who have CF. It colonizes the airways of about 40 percent of CF patients between the ages of 6 and 10. By the age of 17, the frequency of infection increases to more than 50 percent and reaches approximately 60 percent of all CF patients between the ages of 25 and 34. It is a significant cause of bacterial respiratory infections in COPD patients and also a common cause

of other pneumonias. Once patients have the antibiotic-resistant mucoid form of *P. aeruginosa*, their overall lung function precipitously declines, resulting in a poor clinical prognosis.

AB569 is to be administered to patients as a nebulized solution or powder.

Dr. Hassett is working with physicians at the Cincinnati VA Medical Center who have started a Phase I human trial in healthy volunteers testing the safety and pharmacokinetic profile of AB569. •

- *P. aeruginosa* is significant cause of bacterial respiratory infections
- Hassett earlier found that *P. aeruginosa* was susceptible to slightly acidified sodium nitrite
- Subsequently discovered synergism by adding disodium ethylenediaminetetraacetic acid
- U.S. patent #9,925,206 issued
- Phase I trial has begun
- 70,000 CF patients and 251 million COPD patients estimated worldwide



Summary for Diagnosis

Diagnoses:

Distinct values:

Records that are null:

- 696,112
- 7,826
- 3,619
- 0.5%

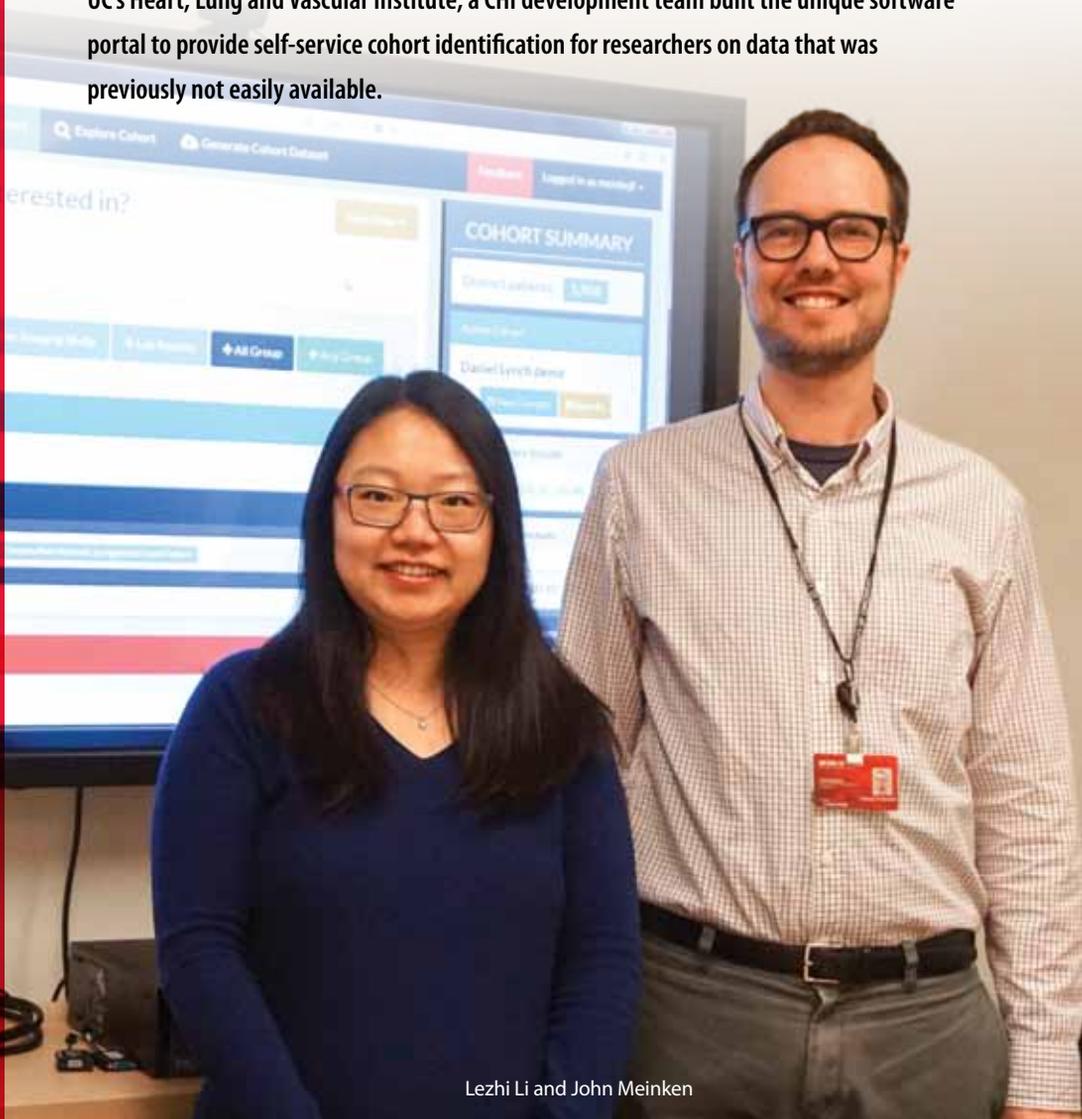
Top 10 Values



# BIOINFORMATICS

## New Web Application Integrates Echocardiogram Data to Aid Study Recruitment

A web application called Asclepius developed by the Center for Health Informatics (CHI) within College of Medicine's Department of Biomedical Informatics offers medical researchers one-stop access to more patient-focused data than ever before. The stand-alone system integrates key echocardiogram data with patient history data from Epic, UC Health's electronic health record. Under the direction of and with funding from UC's Heart, Lung and Vascular Institute, a CHI development team built the unique software portal to provide self-service cohort identification for researchers on data that was previously not easily available.



Lezhi Li and John Meinken

Epic is the system used to access, organize, store and share electronic medical records. Since it stores most patient-centered data, it offers medical researchers a quick and easy way to do cohort discovery—identifying a group of patients that would be well suited to participate in a particular study.

However, significant amounts of data are not housed in Epic and never transfer there. Yet this data is vastly important—especially for research. One example is echocardiogram data acquired during tests and procedures. Typically,

only selected portions and summary statements are moved to Epic while all the other data stays in the source system, MergeCardio.

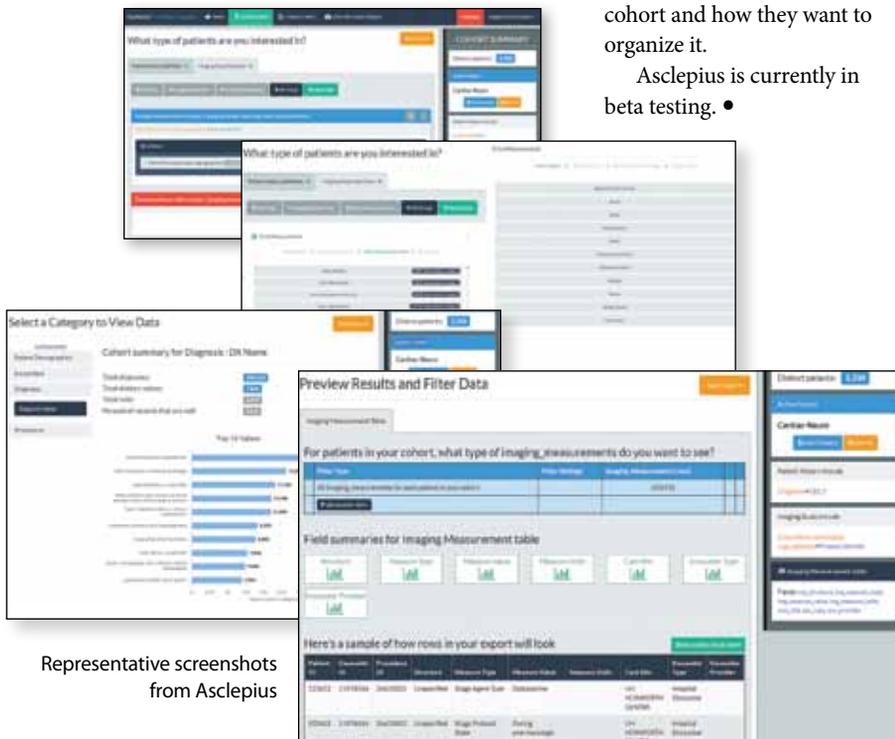
The purpose of the Asclepius project is to provide clinical staff and researchers with a robust web application for cohort identification using “echo” data combined with demographic and other clinical data in Epic. This discovery tool will function with two views: A research view that is de-identified per the federal Health Insurance Portability and Accountability Act Privacy Rule, and a separate view

with identified data that can be used clinically or with Institutional Review Board approval.

The interface contains three major sections: A cohort builder, a cohort explorer and a data exporter. The cohort builder is a user interface where users can define filters that patients must match in order to be included in their cohort. Once a cohort is defined, the cohort explorer can be used to view summary statistics. The last section is the data exporter, which allows the user to customize what data they want to export for their cohort and how they want to organize it.

Asclepius is currently in beta testing. •

- Medical researchers use electronic health records to identify patients for study recruitment
- New web application Asclepius integrates echocardiogram data with patient data for the first time
- This one-stop portal will make cohort discovery easier for researchers
- The Asclepius system includes a cohort builder, a cohort explorer and a data exporter.



Representative screenshots from Asclepius

## Creating Algorithms to Prevent Weight-Based Medication Errors

**D**anny T. Y. Wu, PhD, assistant professor in the Department of Biomedical Informatics, recently joined forces with S. Andrew Spooner, MD, professor of pediatrics and chief medical information officer at Cincinnati Children's, to tackle a weighty problem: The possibility that weights entered incorrectly into electronic systems could lead to medication errors for patients. Their work took a significant step forward in July when Dr. Wu won a grant from the AAMI Foundation to develop and evaluate a machine learning algorithm to improve the accuracy of their prototype pediatric weight entry error detection system.



S. Andrew Spooner, MD (left) with Danny T. Y. Wu, PhD

Dr. Wu's research focuses on maximizing the value of clinical data stored in electronic health records (EHRs).

Since a patient's weight is usually measured via a scale not directly interfaced to EHR systems, errors can occur when weight data are inaccurately read and entered or when a scale is not operated properly. For example, a 30-pound child can be improperly dosed if the weight is recorded as "30 kg," resulting in a 2.2-fold overdose.

To prevent potential harm, the team developed a web-based system to detect weight entry errors. So far, the system's positive predictive value is not high enough to justify a hard stop to medication administration. A hard stop is the goal, because research has shown that clinicians over time tend to ignore simple computerized warnings.

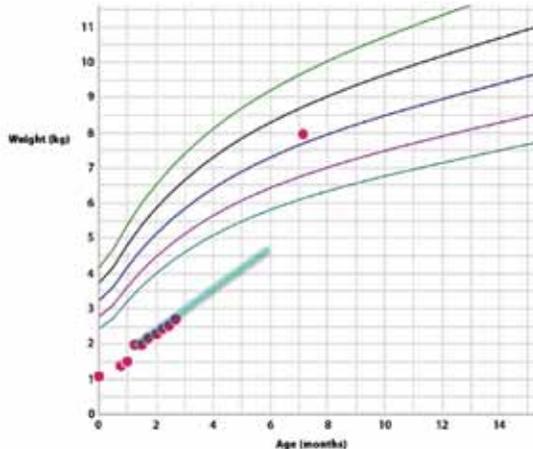
The algorithm that Dr. Wu's team is now developing represents a next step toward a more accurate system.

In this project, Dr. Wu's team will:

- Optimize a prototype visual annotation tool to support the rapid collection of expert-annotated weight errors.
- Use that tool to collect a large set of expert-annotated weight errors based on review of 15,000 growth charts. They will train multiple machine learning algorithms on that data set using different techniques.
- Compare and evaluate the performance of the algorithms against the large-scale gold standard to determine which algorithms show high sensitivity and specificity. •

Others on the team include Karthikeyan Meganathan and Matthew Newcomb, MD, of the College of Medicine; Yizhao Ni, PhD, Judith Dexheimer, PhD, and Eric Kirkendall, MD, of Cincinnati Children's; and P.J. Van Camp and Lei Liu of UC's biomedical informatics PhD program.

- Many pediatric medication doses are calculated using a patient's weight
- Weights entered incorrectly into electronic systems could lead to medication errors
- New algorithms are being developed with higher predictive value to prevent potential harm
- An automated system capable of reliably detecting and stopping medication errors is the goal





A hand wearing a blue nitrile glove is holding a white paper bag over a glass beaker. The beaker contains a dark, viscous liquid. A pipette is visible in the background, suggesting a laboratory or research setting. The entire image is overlaid with a semi-transparent red filter.

# STUDENT RESEARCH

## Highlights in Graduate Education at the College of Medicine 2017-18

The College of Medicine is heavily invested in the training of students for advanced degrees in biomedical research, our goal being to contribute at the highest level to the future biomedical science workforce. At the beginning of the 2017-2018 academic year, there were 675 students engaged in pursuing studies toward their master's or doctoral degrees across the range of biomedical disciplines within the college. Following are a few highlights of the national and international recognitions that members of our student body regularly receive.



Andrew Kim, Medical Scientist  
Training Program (MD/PhD)

**R**yan Makinson, PhD, who graduated from UC's **Neuroscience Graduate Program** in December 2017, was awarded a one-year fellowship from the **American Association for the Advancement of Science** to be pursued in Washington, DC. This opportunity is offered to outstanding scientists and engineers, allowing them to learn first-hand about policymaking while contributing their knowledge and analytical skills to the federal policymaking process. Dr. Makinson's efforts to promote neuroscience research have included lobbying in Washington, DC, and inviting Congressional representatives to UC. Furthermore, Dr. Makinson was named one of only two recipients of the **Presidential Graduate Student Medal of Excellence**, the highest award the University of Cincinnati bestows on its graduate students. This is the second consecutive year that the Neuroscience program has been honored to sponsor a winner of this award.

**J**ason McCoy, a third-year PhD student in the laboratory of Tom Thompson, PhD, in the Department of Molecular Genetics, Biochemistry and Microbiology, was awarded

a two-year **American Heart Association Predoctoral Fellowship**. His dissertation project is focused on two closely related signaling molecules of the TGF $\beta$  family, myostatin and GDF11. While myostatin is a known negative regulator of muscle, GDF11 is thought to have important roles in aging. Jason's project is centered on understanding the molecular mechanism for how these molecules are regulated. He recently was **co-first author on an article in the Proceedings of the National Academy of Sciences** ("Molecular characterization of latent GDF8 reveals mechanisms of activation," 2018) describing the details for how myostatin and GDF11 are held in an inactive or latent state. Furthermore, the work described how mutation of the precursor form

can render myostatin and GDF11 active, bypassing the latent state. In 2018, Jason was also awarded a grant to attend the CCP4 workshop where students are trained in contemporary methods for solving macromolecular structures through X-ray crystallography and, additionally, was named as one of UC's **2018 Ryan Foundation Fellows**, a highly prestigious award limited to students from UC, Dartmouth College and Harvard University.

**K**eila Miles, a student in the **Neuroscience Graduate Program**, was awarded a **F31 Ruth L. Kirschstein National Research Service Award from the National Institutes of Health** for her research on "The Impact of Ketosis on Creatine Transporter Deficiency." This national



Keila Miles, Neuroscience Graduate Program

award enables highly promising pre-doctoral students, who have the potential to develop into productive, independent research scientists, to obtain mentored research training while conducting dissertation research.

In addition, Keila, along with another Neuroscience graduate program student, Jennifer Patrilli Cram, were two of only 40 doctoral students across the nation to be accepted into the **Yale Ciencia Academy for Career Development**. The academy is sponsored by the non-

profit organization Ciencia Puerto Rico in collaboration with Yale University. It provides opportunities for professional mentorship, networking and other skills designed to increase the number of Puerto Rican and Hispanic scientists serving their communities through science outreach. As part of their year, both students were invited to the annual meeting of the American Association for the Advancement of Science, where Jennifer took excellent advantage of networking opportunities.



Jennifer Patrilli Cram, Neuroscience Graduate Program

**G**abriel Gracia-Maldonado, a doctoral student in the **Pathobiology and Molecular Medicine graduate program**



(lab of Ashish Kumar, MD, PhD, associate professor of pediatrics), was selected as a recipient of a **2017-2018 STEM Chateaubriand Fellowship**, a program sponsored by the Embassy of France in the United States. It supports outstanding PhD students from American universities who wish to conduct research in France for a period ranging from four to nine months. Chateaubriand Fellows are selected via a merit-based competition, through a collaborative process involving expert evaluators in both countries. Gabriel has spent his year working with Philip Pierre, PhD, of the Centre d'Immunologie de Marseille-Luminy on studies of the LAMP5 gene in leukemia.

**N**ishant Gupta, MD, graduated from the **MS in Clinical and Translational Research (CTR) program** in August 2017. He has made significant contributions to the literature and research based on this training at UC in the CTR program. Dr. Gupta developed a research proposal while participating in the Design

and Management of Field Studies in Epidemiology course (Co-Instructors: Erin Haynes, DrPH, professor of environmental health, and Patrick Ryan, PhD, associate professor of pediatrics) and it was **funded as an National Institutes of Health R34 grant** titled “Resveratrol and Sirolimus in LAM Trial.”



Nishant Gupta, MD, graduated from the MS in Clinical and Translational Research program

**A**ndrew Kim is a **Medical Scientist Training Program (MD/PhD)** student in his fifth year of PhD studies in the lab of Katherine Yutzey, PhD, professor of pediatrics, in the Heart Institute at Cincinnati Children’s. His research is on molecular mechanisms of heart valve disease with a focus on myxomatous valve disease in Marfan Syndrome. In early 2018 he was selected as a **participant in the Lindau Nobel Laureate Meeting** held in Lindau, Germany in June 2018. This meeting included presentations and interactions with Nobel Prize winners in multiple fields as well as graduate students from around the world. Previously, Andrew was awarded the Molecular and Developmental Biology Graduate Program’s highest academic honor, the **Akeson Award for Academic Excellence** in September 2017 and he was successful in obtaining a highly competitive **American Heart Association Predoctoral Fellowship.** •

## WISE Nurtures Talent Among UC Undergraduates, Celebrates 20th Anniversary

**N**goc Nguyen spent her summer learning how molecules known as surfactants in liquid soap interact with proteins on the human skin. The sophomore in the Medical Sciences Program in the College of Medicine was one of 23 students in the Women in Science and Engineering (WISE) initiative at UC. Ngoc, interested in biomedical research, conducted her research on the interactions of skin proteins with surfactant mixtures in the laboratory of Harshita Kumari, PhD, assistant professor in the College of Pharmacy, and worked closely with Ed Smith, a research fellow at Procter & Gamble. Ngoc presented her findings before an audience of students, faculty and other supporters, who offered real-time honest feedback.



Ngoc Nguyen, sophomore in the College's undergraduate Medical Sciences Program

WISE is part of a university effort to encourage the participation of talented young women in ongoing research. The goal of the program is to expose students to various aspects of scientific research, and to encourage the pursuit of advanced studies in science, math and engineering. Initiated in 1999, WISE pairs women pursuing undergraduate studies with a faculty mentor.

Each week participants meet as a group to discuss their projects and hear from guest speakers about a variety of topics including decisions about graduate studies, giving professional talks, reading scientific journals and developing leadership skills, explains Heather Norton, PhD, associate professor of anthropology in the UC College of Arts and Sciences and co-director of the WISE Program.

WISE celebrated its 20th anniversary during a special ceremony July 2018. Bleuzette Marshall, PhD, vice president for equity, inclusion and community impact at UC, was mistress of ceremony, while Kristi Nelson, PhD, senior vice president for academic affairs and provost, offered greetings at the event.

“The WISE program has introduced me to some of the most incredible people I have ever met,” says Ngoc. “The WISE committee is amazing, and the workshops I was able

to attend offered me so many resources that I can use to look for my passion and to consider future career paths. The WISE fellows, my fellow students, are an incredible group of women, very talented and dedicated, and it was awesome to see their progress through the summer.

“It was also great for me to see what industrial science is like because I was curious about that. I wasn’t sure whether I wanted a career in an industrial setting or a hospital setting,” says Ngoc.

Yana Zavros, PhD, professor in the College of Medicine’s Department of Pharmacology and Systems Physiology and co-director of WISE, says students benefit from learning how to do scientific research, prepare a manuscript and then present their findings to a scientific audience. She said undergraduates also got a chance to interact with



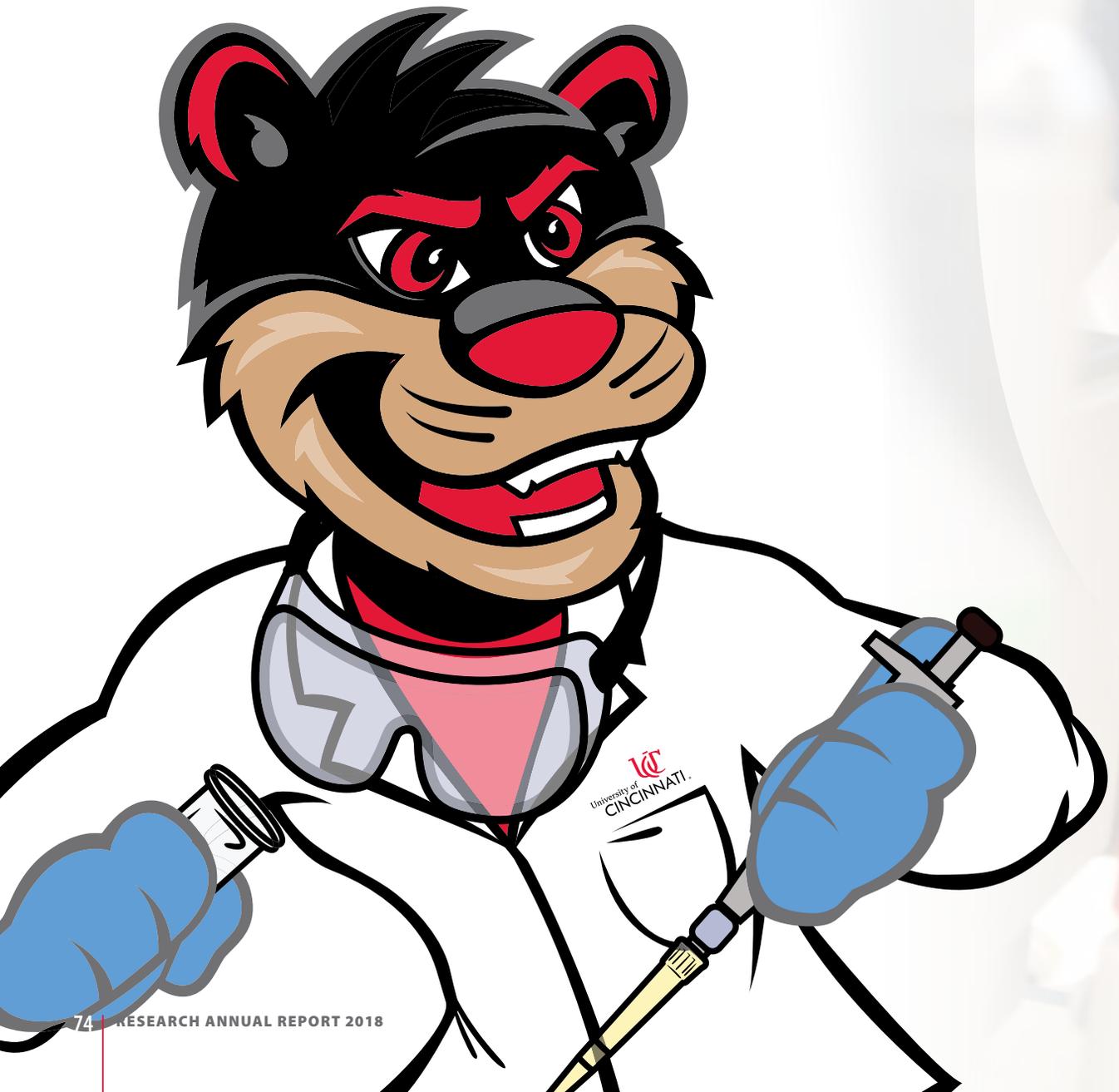
Ngoc Nguyen, a sophomore in the College’s Medical Sciences program and one of 23 students in UC’s WISE program (right), with Dr. Harshita Kumari, in whose laboratory Nguyen conducted her research.

female Procter & Gamble executives.

“Our class this year included a really diverse group of young women,” says Dr. Zavros. “They span disciplines from architectural engineering, cancer biology, chemistry, mathematics, pharmacy and nursing, to name just a few areas of study.” •



WISE participant Megan Urbanic, a junior biology major, worked in the laboratory of Tom Cunningham, PhD, assistant professor in the College of Medicine’s Department of Cancer Biology.





# RESEARCH HONORS

## College of Medicine Team Science Award

The Team Science Award recognizes a team of College of Medicine faculty members who have successfully created and sustained a multidisciplinary research team that significantly contributes to the mission of the College.

### Translational Signatures Network

*Nominated by:*

Melissa DelBello, MD, Department of Psychiatry and Behavioral Neurosciences

Shuk-Mei Ho, PhD, Department of Environmental Health

Peter White, PhD, Department of Biomedical Informatics



Robert McCullumsmith, MD, PhD ; Jarek Meller, PhD; Adam Funk, PhD; Kenneth Greis, PhD (left to right)

The Translational Signatures Network (TSN) is a group of scientists seeking to ask and answer the largest possible questions in translational neuroscience. Driven by a common interest to understand the pathophysiology of severe neuropsychiatric illness, this team was originally formed in 2015 with a collaboration between Robert McCullumsmith, MD, PhD (UC College of Medicine), Jarek Meller, PhD (Cincinnati Children's), Adam Funk, PhD (UC College of Medicine) and Kenneth Greis, PhD (UC College of Medicine).

**Team Goal:** The original goal of this team was to develop a bioinformatics workflow permitting analysis of synaptic proteome and kinome datasets.

This grand challenge is based on the premise that

1) synapses are the focus of much of the genetic risk for developmental disorders such as autism and schizophrenia; 2) simply measuring nucleic acids (with RNAseq or microarrays) does not account for the higher order changes in protein-protein interactions conferred by environmental and genomic risk factors; and 3) there is a driving need to identify targets and biomarkers for development of new treatment strategies and interventions for these often devastating illnesses.

**Team Progress:** Over the past year, the team has been reconceptualized and expanded to include members from outside of UC College of Medicine and Cincinnati Children's. After extensive discussions and meetings at the annual American College of

Neuropsychopharmacology conference in December 2016, the concept of a network of laboratories with a common interest in identifying profiles or "signatures" that may serve as a common medium between animal models and human samples was developed, providing a powerful substrate for big data analytics and identification of drug leads. Moving beyond human brain samples, the new team members brought models of "broken" synapses (Amy Ramsey, PhD, University of Toronto) and cell subtype-specific genetic risk (Misha Pletnikov, MD, PhD, Johns Hopkins University). With this expansion, the TSN is now focused on generating signatures and drug leads from human brain samples as well as analogous models of human disease. •

## 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.

### Lawrence Goldstick, MD

Department of Neurology and Rehabilitation Medicine



Lawrence Goldstick, MD (holding award), with Brett Kissela, MD

Over the course of the last several years Dr. Goldstick and his team have been actively involved in clinical trials, mainly pharmacological trials and National Institutes of Health (NIH) trials to a more limited extent. Dr. Goldstick and his team's main involvement has been with multiple sclerosis trials, but have also been involved with Alzheimer's trials and NIH headache trials. Dr. Goldstick has been involved in 15 to 20 multiple sclerosis trials, five to 10 Alzheimer's trials and headache trials. Recent trials involve new treatments

for relapses, comparator studies of monomethyl fumarate and dimethyl fumarate, initial treatment with ocrelizumab as initial therapy and recent onset of multiple sclerosis, and utilization of remyelinating agents in combination with immunomodulating therapies in the treatment of multiple sclerosis. Other studies have involved utilization of S1 P1 receptor agonists in the treatment of secondary progressive multiple sclerosis. Dr. Goldstick and his team are currently starting a study utilizing extended interval dosing of natilizumab

looking at efficacy measures and decrease in incidence of PML in JC positive patients. Further studies have included studies of monoclonal antibodies directed at amyloid in Alzheimer's disease, beta secretase inhibitors in Alzheimer's disease, and utilization of Tau therapies in Alzheimer's disease. Further studies include an NIH/ Patient-Centered Outcomes Research Institute study looking at different treatment algorithms in medication overuse syndromes. •

## 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.

### A. Phillip Owens III, PhD

Assistant Professor

Department of Internal Medicine

Division of Cardiovascular Health and Disease; Heart, Lung and Vascular Institute

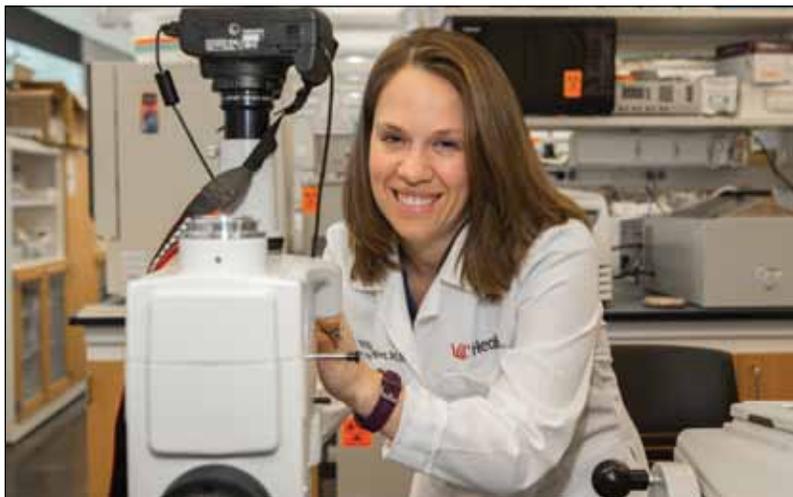


### Trisha Wise-Draper, MD, PhD

Assistant Professor

Department of Internal Medicine

Division of Hematology Oncology



### A. Phillip Owens III, PhD

Dr. Owens arrived at UC with a K99/R00 obtained while at the University of North Carolina, Chapel Hill, examining the role of tissue factor and clot formation in abdominal aortic aneurysm (AAA). This project combined Dr. Owens' graduate studies involving AAA and his postdoctoral studies involving coagulation into his own unique niche. Since arriving at UC, Dr. Owens has applied for and received numerous internal grant awards, including: Center for Clinical & Translational Science & Training Just-In-Time Core Grant, The Junior Pilot Award, Rehn Family Research Foundation Award and the Near Horizons Collaborative Grant. Recently,

Dr. Owens received his first R01 for the grant titled, "The Role of PAR2 in Atherosclerosis," submitted to the Atherosclerosis and Inflammation of the Cardiovascular System Study Section under the National Heart, Lung and Blood Institute branch of the National Institutes of Health. Along with this R01, Dr. Owens also has a Bayer Grant that is soon to be funded examining the role of rivaroxaban in atheroprotection to mechanistically interpret the recent advances from the COMPASS trial.

In addition to his grant accolades, Dr. Owens' work has garnered considerable recognition within the cardiovascular community. He has been invited to give

oral presentations at a number of highly regarded academic medical centers and institutions across the country, including Purdue, UC, Cincinnati Children's Hospital Medical Center, the Cleveland Clinic, Thomas Jefferson University and the University of Kentucky. In addition, he was awarded the Kenneth M. Brinkhous Young Investigator Prize in Thrombosis at the annual Arteriosclerosis, Thrombosis and Vascular Biology conference. He currently boasts an h-index of 19 and i10-index of 24, which is impressive for such a young investigator. His review examining the role of "Microparticles in Hemostasis and Thrombosis" published in *Circulation*

*Research* in 2011 has already received 475 citations. He is also the first or associated author on five other publications that have received more than 100 citations since 2010 and has 22 total authorships on primary journal articles and 11 invited review article publications. He recently authored his first senior publication in the *Journal of the American Heart Association*, which was published in January 2018. Further, his second and third senior author publications are currently under minor and major revisions to the outstanding journals *Blood and Arteriosclerosis, Thrombosis, and Vascular Biology*. •

### Trisha Wise-Draper, MD, PhD

Dr. Wise-Draper's research interest is the development of novel therapies for advanced solid malignancies. She is currently the principal investigator on six industry-sponsored and cooperative group clinical trials phase 1-3 and a sub-investigator on over 40. She recently received a Department of Defense grant for her work to identify possible mechanisms of resistance to immunotherapy in cancer. Very specifically, she has been widely published (25 peer-reviewed publications; nine first-author and one last author), holds three

federally funded grants and multiple industry-sponsored clinical trials. Since she joined the faculty she has received multiple awards and recognitions, including Top Doctors Cincinnati (2017), Rising Star Medical Leader (2016), nominee for Forty under 40 (2016), and a KL2 Award Winner (2016).

Despite Dr. Wise-Draper's short career, her 17 total publications, 543 total citations and an average 32 citations per publication is indeed impressive. She has already established herself in the academic environ-

ment based upon her scholarly work. She has also established relationships with several collaborators locally and nationally and has published with several already as well as gained funding either as a sub-investigator or co-PI. She was awarded a KL2 mentored award under the mentorship of Laura Conforti, PhD, further strengthening that relationship.

She was named medical director of the Cancer Clinical Trials Office in November 2016. As medical director, she serves as the liaison between the

office and investigators as well as sponsors. Since she became medical director, the atmosphere of the office has improved greatly, staff turnover has slowed, a training program has been established, a career ladder developed, much needed processes have been streamlined by creating subcommittees, the regulatory office is coming into compliance, a great working relationship with the Office of Clinical Research as well as several other departments has been established, and trial activation timelines shortened. •

## Research Professional Award

Many College of Medicine staff serve our research mission in a way that vastly transforms productivity and drives the research enterprise. They do so by contributing to publications and grant proposals, acquiring and managing clinical trials, designing and executing experiments, recruiting, educating and protecting clinical research participants, analyzing data, maintaining regulatory compliance, engaging the community in the research enterprise and mentoring future researchers. They often serve with little recognition for the time and expertise they commit to improving the quality and rigor of laboratory and clinical research.

### **Kathleen Alwell, RN, BSN**

Department of Neurology and Rehabilitation Medicine

Nominated by: Brett Kissela, MD, Daniel Woo, MD, and Dawn Kleindorfer, MD

### **Rebecca Schuster, MA**

Department of Surgery

Nominated by: Alex Lentsch, PhD; Timothy Pritts, MD, PhD; Amy Makley, MD; and Michael Goodman, MD



Kathleen Alwell, RN, BSN (center left) and Rebecca Schuster, MA (center right) flanked by Brett Kissela, MD and Melanie T. Cushion, PhD

**Kathleen Alwell, RN, BSN**

Kathleen Alwell, RN, BSN, has been a nurse for 25 years and has been with the Department of Neurology and Rehabilitation Medicine for the past 20 years. She has been the

Clinical Coordinator of the Greater Cincinnati/Northern Kentucky Stroke Study since 1998, a study continually funded by the National Institutes of Health for the past 25 years.

She is responsible for the overall coordination of the ascertainment process and reviews and assists with the integration of all data in this retrospective, population-based

epidemiology project. She has also coordinated various ancillary studies during this time, most currently the LANTERN and APRISE studies. •

**Rebecca Schuster, MA**

Rebecca Schuster, MA, is a Research Associate who has been supporting the Lentsch, Pritts, Goodman and Makley Laboratories for many years. She manages the daily functions of these labs and contributes in many ways to the overall research mission of the Department of Surgery and the University

of Cincinnati.

After spending almost 20 years in research, Rebecca knows what a basic science laboratory looks like and makes sure employees—whether staff, resident or student—are contributing in a meaningful and productive way. Rebecca is a co-author on many manuscripts and presenta-

tions and is always willing to help and collaborate with others. She enjoys training new employees and prides herself on being a kind and thoughtful mentor. In addition to being proficient in routine laboratory practices, Rebecca is a certified histologist and prides herself on this. Rebecca enjoys working in the Department

of Surgery and strives to be an integral part of the research team. Through hard work, determination and dedication she has been very successful and will continue to do her best in all aspects of her life. Rebecca's work ethic, expertise and leadership make her an ideal employee. •

**Research Professional Award Finalists****Alan Ashbaugh, BS**

Department of Internal Medicine, Infectious Disease Division

Nominated by: Melanie T. Cushion, PhD and Michael Linke, PhD

**Benjamin Packard, BS**

Department of Psychiatry and Behavioral Neuroscience  
Nominated by: James Herman, PhD, Yvonne Ulrich-Lai, PhD, Eric Krause, PhD, Eric Wohleb, PhD, and Joanne Tetens-Woodring, DVM, PhD

**Frankie Kropp, MS**

Department of Psychiatry and Behavioral Neuroscience  
Nominated by: Theresa Winhusen, PhD, Jennifer Brown, PhD, and LaTrice Montgomery, PhD

**Ameet Ajit Chimote, PhD**

Department of Internal Medicine

Nominated by: Laura Conforti, PhD, Charuhas Thakar, MD, Edith Janssen, PhD, and Michael Arnold

**Jamie Morris, BA**

Department of Pathology and Laboratory Medicine

Nominated by: W. Sean Davidson, PhD, John Melchior, PhD, Patrick Tso, PhD, and Gangani Silva, PhD

**Daniel Hargraves, MSW**

Department of Family and Community Medicine

Nominated by: Christopher White, MD, JD, Jeffrey Schlaudecker MD, Christopher Bernheisel, MD, and Ilana Bergelson

## Research Service Award

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

### **Jun-Ming Zhang, MD, MSc**

Vice Chair for Research and the Endowed Chair in Anesthesia Research and Education

Department of Anesthesiology

Nominated by: Andrew Friedrich, MD



### Jun-Ming Zhang, MD, MSc

Dr. Zhang has built a thriving pain research program from the ground up. He has supervised the hiring of new research faculty in the department, as well as provided administrative support and valuable mentoring for these investigators as they grew their research programs. As a result of his leadership, the Department of Anesthesiology now ranks in the top 25 of anesthesiology departments nationwide in terms of National Institutes of Health funding. He also served as the chair of the Organizing Committee for the 2013 Midwest Regional Pain Interest Group meeting, which brought

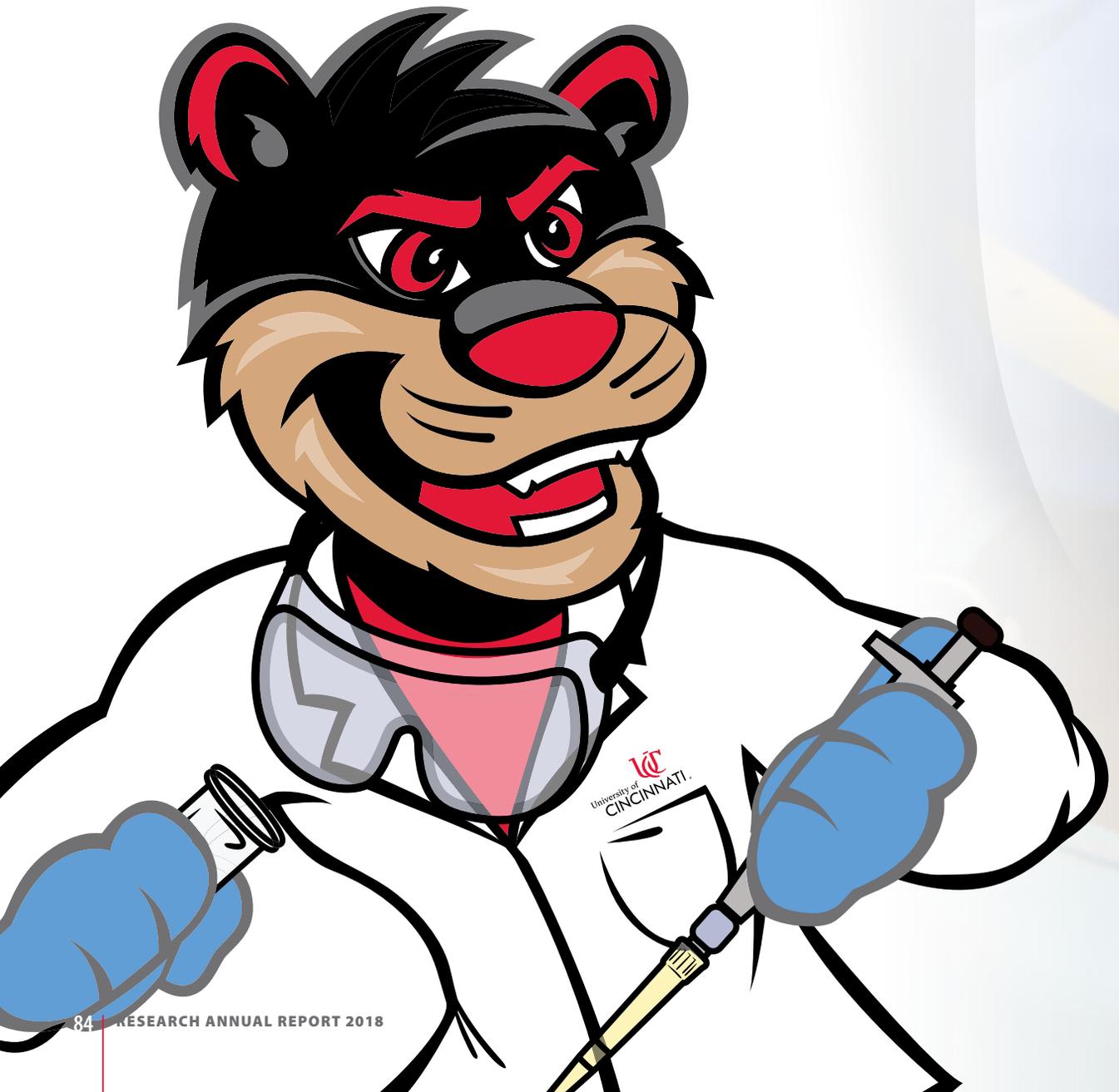
esteemed pain researchers from across the region to Cincinnati and highlighted the exciting research ongoing at the College of Medicine. Importantly, Dr. Zhang also has contributed to the wider success of biomedical research across the college. For example, he has served on the Executive Committee of the Neurobiology Research Center (NRC) within the UC Gardner Neuroscience Institute (UCGNI) since its inception. He has also participated multiple times as a peer reviewer for the UCGNI-NRC pilot grant program, thus providing valuable feedback to investigators with the goal of improving

their external funding applications. In addition, he has selflessly contributed to the administration and oversight of research at the college by serving on the Institutional Animal Care and Use Committee since 2006.

Recognizing the opportunity to synergize the pain research at UC with the growing pain research efforts at Cincinnati Children's, Dr. Zhang also has served on faculty search committees in the Cincinnati Children's Department of Anesthesia and is a current member of the Executive Committee for the Cincinnati Children's Collaborative for Understanding

Pediatric Pain. Dr. Zhang's service also extends to the educational mission of the college. He has been a regular member of the admissions committee for the Medical Scientist Training Program since 2014, and has also assisted with interviewing applicants for the Neuroscience Graduate Program. In addition to mentoring PhD students in his lab, Dr. Zhang has contributed to the training of many other graduate students at the college by serving on numerous qualifying exam and dissertation committees. •







**RESEARCH GRANTS**

## Research Grants FY 2018

### Zalfa Abdel-Malek, PhD



Professor  
Department of  
Dermatology

#### **“MC1R-Selective Small Melanocortin Analogs for Melanoma Prevention”**

- Melanoma Research Foundation Award
- Grant runs from Oct. 1, 2017 to Sept. 30, 2019
- \$200,000 in total costs

The translational outcome of this project, which is based on compelling and extensive data, will have a huge impact on melanoma prevention in millions worldwide with high risk for melanoma, particularly those who are carriers of MC1R variants and/or mutations in other melanoma predisposition genes, such as CDKN2A.

#### **“Targeting the Melanocortin 1 Receptor by Selective Small Analogs of $\alpha$ -Melanocortin for Melanoma Prevention”**

- Veterans Administration Merit Award
- Grant runs from April 1, 2018 to March 31, 2022
- \$1,039,449 in total costs

This research aims to develop a melanoma chemoprevention strategy based on targeting the melanocortin 1 receptor (MC1R) by tetra- and tripeptide analogs of its physiological agonist  $\alpha$ -melanocyte stimulating hormone ( $\alpha$ -MSH). These peptides mimic  $\alpha$ -MSH in enhancing repair of ultraviolet radiation (UV)-induced DNA damage, and stimulating pigmentation in human melanocytes in the absence of UV exposure, but are expected not to cause immunosuppression. They are unique in their high selectivity for MC1R, and are stable and lipophilic. Researchers will develop these peptides in a topical formulation and will test their efficacy in stimulating pigmentation and reducing UV-induced DNA damage in cultured human skin in vitro and in two animal models in vivo.

### Opeolu Adeoye, MD



Associate Professor  
Department of  
Emergency Medicine

#### **“Strategies to Innovate EmergENcy Care Clinical Trials Network (SIREN)”**

- National Institute of Neurological Disorders and Stroke U24
- Grant runs from July 15, 2017 to May 31, 2022
- \$850,175 in total costs

The SIREN overarching goal is to bring more than just participants to the SIREN Network; researchers will meaningfully contribute to the growth and success of SIREN through communication and collaboration with other systems to maximize the effectiveness of the entire network.

#### **CO-INVESTIGATORS:**

**Gregory Fermann, MD**, Department of Emergency Medicine  
**Jay Johannigman, MD**, Department of Surgery  
**Jason McMullan, MD**, Department of Emergency Medicine

## RESEARCH GRANTS FY2018 (continued)

**Opeolu Adeoye, MD**

Associate Professor  
Department of Emergency Medicine  
(continued)

**“POINT: Platelet-Oriented Inhibition in New TIA”**

- National Institute of Neurological Disorders and Stroke Sub Award
- Grant runs from May 1, 2017 to April 30, 2018
- \$170,201 in total costs

The primary specific aim of this randomized, double-blind, multicenter clinical trial is to determine whether clopidogrel 75 mg/day by mouth after a loading dose of 600 mg is effective in improving survival free from ischemic vascular events (ischemic stroke, myocardial infarction and ischemic vascular death) at 90 days when initiated within 12 hours of onset of transient ischemic attack or minor ischemic stroke in patients receiving aspirin 50-325 mg/day. Target enrollment is 5,000 patients over five years at 150 centers.

**“TBI Endpoints Development (TED)”**

- Department of the Army Medical Research Acquisition Activity
- Grant runs from Sept. 30, 2016 to Sept. 29, 2018 and totals
- \$101,200 in total costs

Dr. Adeoye will serve as an expert in emergency medicine, neurocritical care and multicenter trials. Dr. Adeoye is the UC principal investigator and will oversee clinical enrollment and supplemental TED follow-up assessments at his site during the Validation Phase in Years 3 and 4.

**“Multi-arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial”**

- National Institute of Neurological Disorders and Stroke U01
- Grant runs from June 1, 2018 to April 30, 2023
- \$18,146,486 in total costs

The MOST trial will test whether rt-PA combined with one or the other of two medications (argatroban and eptifibatide) is better than rt-PA alone for the treatment of acute ischemic stroke. Both of these IV medications may be combined with IV rt-PA at all hospitals capable of giving rt-PA. If shown to be better than rt-PA, these combinations have the potential to help up to 1,800 additional people in the U.S. fully recover from strokes each year, as well as reduce the costly burden of disability in those who partially recover.

**CO-INVESTIGATOR:**

**Joseph Broderick, MD**, Department of Neurology and Rehabilitation Medicine

RESEARCH GRANTS FY2018 (continued)

**Jonathan Bernstein, MD**



Professor, Department of Internal Medicine, Division of Immunology, Allergy and Rheumatology

**“Treatment of Chronic Urticaria Unresponsive to H1-antihistamines with an Anti-IL5Ralpha Monoclonal Antibody”**

- Advanced Allergy Services, LLC Award
- Grant runs from July 31, 2017 to Oct. 31, 2019
- \$427,755 in total costs

This research is designed to determine the effectiveness of an IL-5R antagonist in the treatment of chronic idiopathic urticaria unresponsive to antihistamines. Researchers also will investigate pathomechanisms by obtaining skin biopsies before and after treatment to determine relevant biologic pathways in hives and how they are effected by treatment.

**Thomas Blakeman, MSc, RRT**



Instructor, Department of Surgery

**“Maximizing Oxygen Delivery Across Deployed Services”**

- Air Force Research Laboratory Award
- Grant runs from Sept. 7, 2017 to June 6, 2019
- \$151,989 in total costs

This study will determine the optimal method of oxygen delivery that provides the highest inspired oxygen without altering the delivered tidal volume. The study has four specific aims: 1) Determine the range of performance of currently deployed oxygen concentrators paired with currently deployed ventilators. 2) Evaluate efficiency of oxygen use in ventilators with pulse dose into circuit/continuous flow into compressor inlet. 3) Determine the impact of oxygen delivery on delivered tidal volume. 4) Define operational characteristics in a hypobaric environment.

**CO-INVESTIGATOR:**

**Richard Branson, MSc, RRT**, Department of Surgery

**Vladimir Bogdanov, PhD**



Associate Professor, Department of Internal Medicine, Division of Hematology Oncology

**“Disrupting Tissue Factor-beta1 Integrin Axis in Pancreatic Cancer”**

- Pancreatic Cancer Network Award
- Grant runs from July 1, 2017 to July 1, 2019
- \$300,000 in total costs

The overall objective of this research is to evaluate recently developed, fully humanized antibody targeting alternatively spliced Tissue Factor (asTF), termed RabMab1, as a new therapeutic approach in treating pancreas cancer. In addition, researchers will evaluate whether measuring asTF levels in pancreas cancer patients has prognostic value and can serve as a tool for targeted therapies. AsTF expression and release into the stroma is often increased in pancreatic ductal adenocarcinoma. AsTF binds cell surface molecules called  $\beta$ 1 integrins in a specific region, acting as an integrin activator and triggering processes that drive cancer progression.

**CO-INVESTIGATOR:**

**Syed Ahmad, MD**, Department of Surgery, Section of Surgical Oncology

RESEARCH GRANTS FY2018 *(continued)***Michael Borchers, PhD**

Associate Professor,  
Department of Internal  
Medicine, Division of  
Pulmonary, Critical Care  
and Sleep Medicine

**“Natural Killer Cell Phenotype and Function in Lymphangioleiomyomatosis”**

- Lymphangioleiomyomatosis (LAM) Foundation (LAM)
- Grant runs from Jan. 14, 2018 to Jan. 15, 2020
- \$150,000 in total costs

Successful completion of this research will advance the understanding of NK cells and the NKG2D receptor-ligand axis in the initiation and progression of disease and develop prognostic biomarkers of disease progression. Several therapeutics aimed at modulating NK cell functions are in development for chronic infections, autoimmune diseases and cancer. Researchers hope that these agents will provide new targets for therapy, in addition to existing therapies for LAM, in the near future.

**Joseph Broderick, MD**

Professor, Department  
of Neurology and  
Rehabilitation  
Medicine; Director  
of the University of  
Cincinnati Gardner  
Neuroscience Institute;  
and Director of the  
National Institutes of  
Health StrokeNet

**“Atrial Cardiopathy and Antithrombotic Drugs In prevention After cryptogenic stroke (ARCADIA)”**

- National Institute of Neurological Disorders and Stroke Sub Award
- Grant runs from May 1, 2017 to April 30, 2022
- \$802,863 in total costs

This study will address several important knowledge gaps in the field of stroke. First, it will advance the fundamental understanding of the pathophysiology of stroke by assessing whether atrial cardiopathy is a valid construct as a therapeutic target. To the extent that atrial cardiopathy identifies patients whose markedly elevated risk of stroke can be reduced more with anticoagulation than with aspirin, the stage may be set for a primary prevention trial. Second, this trial will advance our understanding of optimal secondary stroke prevention therapy.

RESEARCH GRANTS FY2018 (continued)

**Jose Cancelas-Perez, MD, PhD**



Professor, Department of Pediatrics and Director, Hoxworth Blood Center

**“Dose Escalation Study Design”**

- National Heart, Lung and Blood Institute Sub Award
- Grant runs from June 15, 2017 to June 14, 2018
- \$151,234 in total costs

This research intends to determine the lifespan of circulating red cells after transfusion of 42-day anaerobically stored red cells and determine the safety of a dose-escalation infusion of red cells in the context of autologous transfusion in health subjects.

**“Verification Protocol for In Vitro Cell Quality of Mirasol-Treated Platelets in 100% Plasma Collected on Trima Accel”**

- Terumo BCT, Inc. Award
- Grant runs from Sept. 7, 2017 to Sept. 6, 2020
- \$316,467 in total costs

This project will determine the biochemical and viability properties of platelets collected with the Trima Accel device/software and pathogen reduction with riboflavin and ultraviolet light upon storage at room temperature.

**“A Phase 1, Multi-center, Open-label, Dose Escalation Study of Thrombosomes in Bleeding Thrombocytopenic Patients in Three Cohorts”**

- Cellphire, Inc. Award
- Grant runs from Dec. 1, 2017 to May 31, 2018
- \$170,513 in total costs

This is a phase 1, safety clinical trial of dose-escalation of frozen-dried platelets (thrombosomes) transfused to thrombocytopenic adult Hematology/Oncology patients. The trial intends to demonstrate whether a therapeutic dose of these modified platelets is safe and potentially beneficial in the prophylaxis and therapy of bleeding.

**CO-INVESTIGATOR:**

**Stephen Medlin, MD**, Department of Internal Medicine, Division of Hematology Oncology

**“Clinical Investigation to Evaluate the New Health Sciences Hemanext Oxygen Reduction System”**

- National Heart, Lung and Blood Institute
- Grant runs from June 15, 2017 to June 14, 2018
- \$451,729 in total costs

This is a pharmacokinetics and dose-escalation clinical study to determine whether anaerobically stored red cells can increase red cell survival and are safe when autologously transfused into healthy subjects.

## RESEARCH GRANTS FY2018 (continued)

**Kathleen Chard, PhD**

Professor, Department of Psychiatry and Behavioral Neuroscience

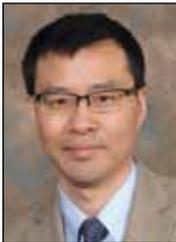
**“Psychometric Evaluation of the Clinician Administered PTSD Scale for DSM-5 (CAPS-5) and the PTSD Symptom Scale Interview for DSM-5 (PSSI-5) in an Active Duty and Military Veteran Sample”**

- Interagency Agreement (IAA) with U.S. Army Medical Materiel Development Activity (USAMMDA) grant
- Grant runs from Jan. 25, 2018 to Dec. 31, 2020
- \$3,538,000 in total costs

The purpose of this research study is to test the reliability of two new post-traumatic stress disorder (PTSD) assessments, Clinician Administered PTSD Scale for DSM-5 (CAPS-5) and PTSD Symptom Scale Interview for DSM-5 (PSSI-5) and compare the results between the two new assessments and the previous “gold standard,” the Clinician Administered PTSD Scale for DSM-IV (CAPS-IV). In addition, exploratory data using EEG, blood and saliva will be collected to establish biomarkers for PTSD.

**CO-INVESTIGATOR:**

**Brian Marx, PhD**, Professor, Boston University School of Medicine

**Aimin Chen, MD, PhD**

Associate Professor, Department of Environmental Health

**“Developmental Neurotoxicity of Organophosphate and Novel Brominated Flame Retardants in Children”**

- National Institute of Environmental Health Sciences Award
- Grant runs from Sept. 30, 2017 to June 30, 2022
- \$3,206,238 in total costs

The research will be the first to comprehensively study developmental neurotoxicity of both organophosphorus flame retardants and novel brominated flame retardants in children. Addressing neuroendocrinological, neurobehavioral and neuroimaging aspects of brain development is highly innovative for this investigation. The findings will be of critical value to the scientific community and policy makers evaluating the potential impact of current-use replacement flame retardants on the developing brain. The research is highly relevant to the National Institutes of Health mission to identify potential chemical exposures that disrupt brain development and provide critical data to inform prevention strategies.

**Robert Cohen, MD**

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

**“Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness Study (GRADE)”**

- National Institute of Diabetes and Digestive and Kidney Disease Sub Award
- Grant runs from Sept. 6, 2017 to July 31, 2018
- \$1,646,683 in total costs

Clinical Sites will follow and retain enrolled patients older than 30 years of age with recent onset type 2 diabetes (less than 10 years in duration), provide and adjust diabetes medications and perform follow-up in accordance with the GRADE study protocol.

RESEARCH GRANTS FY2018 *(continued)*

**John Thomas Cunningham, PhD**



Assistant Professor,  
Department of Cancer  
Biology

**“Leveraging Built-in Enzyme Redundancy to Exploit Cancer Cells’ Achilles’ Heel”**

- V Foundation Award
- Grant runs from Nov. 1, 2017 to Nov. 1, 2019
- \$200,000 in total costs

This research seeks to unravel the molecular basis for this selectivity through use of novel mouse models and structure/function studies, thus pinpointing a putative mechanism of action and developing a rational basis for future drug development.

**Steve Davidson, PhD**



Assistant Professor,  
Department of  
Anesthesiology

**“Thalamo-Limbic Circuits in Pain”**

- National Institute of Neurological Disorders and Stroke R01
- Grant runs from June 15, 2018 to April 30, 2023
- \$1,750,000 in total costs

The cellular and circuit neurobiology underlying the regulation of pain tolerance – the ability to endure pain – is not known. The principal goal of this project is to identify the neural substrates that regulate pain tolerance. This knowledge is anticipated to lead to new ways to alleviate suffering from pain through neuromodulatory approaches to enhance coping.

**George Deepe, MD**



Professor, Department  
of Internal Medicine,  
Division of Infectious  
Diseases

**“HIF Regulation of Histoplasma Pathogenesis”**

- National Institute of Allergy and Infectious Diseases R01
- Grant runs from Feb. 15, 2018 to Jan. 31, 2023
- \$2,003,958 in total costs

Macrophages are a principal effector cell in combating histoplasmosis and require exogenous signals to limit intracellular growth. The transcription factors hypoxia-inducing factors-1 and -2 are needed for proper functioning of these cells. Researchers will explore how these factors regulate the antifungal properties of macrophages.

**“GM-CSF-induced Metal Sequestration and Histoplasma”**

- National Institute of Allergy and Infectious Diseases R01
- Grant runs from July 1, 2018 to June 30, 2023
- \$1,668,531 in total costs

The fungus histoplasma capsulatum multiplies in macrophages and requires zinc for growth. Two cytokines exert disparate effects on fungal survival in macrophages by limiting or adding zinc. This work will decipher how these cytokines regulate zinc homeostasis and provide new data on phagocyte biology.

## RESEARCH GRANTS FY2018 (continued)

**Zhongyun Dong, MD, PhD**

Professor, Department of Internal Medicine, Division of Hematology Oncology

**“Preclinical Safety and Efficacy Assessment of a Novel PCNA Inhibitor for Prostate Cancer Therapy”**

- National Cancer Institute R21
- Grant runs from Aug. 1, 2018 to July 31, 2020
- \$383,398 in total costs

Researchers have discovered a novel class of small molecules that bind PCNA at the interfaces of two monomers, stabilize PCNA trimer structure, attenuate PCNA relocalization and cause functional depletion of PCNA, leading to selective inhibition of tumor cell growth in cell culture and suppression of tumor growth in an animal model. These studies will determine pharmacokinetics, bioavailability, maximum tolerated dose and metabolic stability of PCNA-I1S, and therapeutic effects, pharmacodynamics and toxicity of PCNA-I1S in prostate cancer models, which will provide strong data and rationale supporting the development of this novel class of PCNA inhibitors for therapy against advanced prostate cancers.

**Robert Ellis, MD**

Associate Professor, Department of Family and Community Medicine

**“Choose Ohio First Scholarship Program”**

- Ohio Department of Higher Education Award
- Grant runs from July 1, 2017 to June 30, 2021 and totals
- \$1,080,000 in total costs

This is a state grant to award scholarships to medical students who choose to practice primary care medicine in underserved communities when they complete their training.

**Guochang Fan, PhD**

Associate Professor, Department of Pharmacology and Cell Biophysics

**“Tsg101 and Endosomes in Cardiac Surgery-induced Injury”**

- National Institute of General Medical Sciences R01
- Grant runs from Dec. 10, 2017 to Nov. 30, 2021
- 2,002,923 in total costs

Cardiac surgery-caused ischemia-reperfusion injury remains a major source of post-operative morbidity and mortality. This research is relevant to public health because the elucidation of Tsg101 and the incorporated exosomes in cardiac energy generation is ultimately expected to open new avenues and develop novel delivery tools for transferring those beneficial proteins into the heart, thereby limiting surgically induced cardiac injury. Thus, this project is relevant to the part of the National Institute of Health's mission that pertains to advancing fundamental knowledge and translational study that will help to reduce the burdens of human disability.

RESEARCH GRANTS FY2018 *(continued)***Carl Fichtenbaum, MD**

Professor, Department  
of Internal Medicine,  
Division of Infectious  
Diseases

**“HPTN 083 is a Phase 2b/3 Safety and Efficacy Study of Injectable Cabotegravir Compared to Daily Oral Tenofovir Disoproxil Fumarate/Emtricitabine (TDF/FTC), for Pre-Exposure Prophylaxis”**

- National Institute of Allergy and Infectious Diseases Sub Award
- Grant runs from Jan. 1, 2017 through Nov. 30, 2022
- \$3,599,440 in total costs

This study in 4,500 HIV-uninfected cisgender men and transgender women who have sex with men is designed to evaluate the safety and efficacy of the injectable agent cabotegravir (CAB LA) for pre-exposure prophylaxis (PrEP). This is a multi-site, double blind, two-arm, randomized (1:1), active-controlled noninferiority trial comparing the efficacy of CAB LA to daily oral tenofovir disoproxil fumarate (TDF)/emtricitabine (FTC) for HIV prevention. The study is parsed into three “Steps”: Step 1 is a five-week oral “lead-in” to establish tolerability; Step 2 is the head-to-head injectable-to-oral comparison; and Step 3 provides 48 weeks of open-label oral TDF/FTC to provide ongoing prevention during pharmacokinetic wash-out and transition to clinical prevention services.

**“Resetting Immune Homeostasis: A Non-invasive Approach Toward HIV Eradication”**

- National Institute of Allergy and Infectious Diseases Sub Award
- Grant runs from Aug. 9, 2017 to July 31, 2018
- \$170,915 in total costs

Members of the investigator team will design and implement the resetting immune homeostasis: a non-invasive approach toward HIV eradication trial. This team is responsible for the accrual of 10 participants at the Cincinnati clinical research site for the trial. This team will participate in conference calls, meetings and assist in the design, development, implementation, presentation and publication of the trial.

**“ACTG Core Funds”**

- National Institute of Allergy and Infectious Diseases
- Grant runs from Dec. 1, 2017 to Nov. 30, 2018
- \$374,030 in total costs

The major goals of this research are to design, conduct and analyze clinical trials to treat HIV disease and to treat/prevent its associated complications.

RESEARCH GRANTS FY2018 *(continued)***Brandon Foreman, MD**

Assistant Professor,  
Department of  
Neurology and  
Rehabilitation Medicine

**“The Impact of Intracranial Pressure on Cortical Functioning and Cognitive Outcome After Traumatic Brain Injury”**

- National Institute of Neurological Disorders and Stroke K23
- Grant runs from Sept. 25, 2017 to Aug. 31, 2021
- \$793,568 in total costs

Traumatic brain injury (TBI) affects 1.7 million in the U.S. each year, and survivors of severe TBI (sTBI) face secondary brain injuries during the course of their intensive care unit stay that affect outcome. Intracranial pressure (ICP) monitoring is a cornerstone of modern neurocritical care by acting as a marker of secondary brain injury, but clinical trials have failed to show that lowering ICP improves functional outcome. Further clarifying how the ICP may impact cognitive outcomes after sTBI will allow individually targeted treatments for ICP to be developed.

**Mary Beth Genter, PhD**

Professor, Department  
of Environmental Health

**“Neuroprotective Effects of Carnosine in the Olfactory System in the Thy1-aSyn Mouse Model of Parkinsonism”**

- Department of the Army Medical Research Acquisition Activity Award
- Grant runs from Sept. 30, 2017 to Sept. 29, 2019
- \$510,093 in total costs

The main objective of these studies is to determine the beneficial action of carnosine in decreasing olfactory epithelial aSyn accumulation and preserving olfactory and motor function in Thy1-aSyn mice, and to determine whether the IN route is superior to the oral route of administration. Another goal of the research is to uncover the potential mechanism(s) of carnosine's beneficial effects in the olfactory system.

**Michael Goodman, MD**

Assistant Professor,  
Department of Surgery

**“Role of Acid Sphingomyelinase in the Modulation of Coagulation After Traumatic Brain Injury”**

- National Institute of General Medical Sciences R01
- Grant runs from May 1, 2018 to April 30, 2023
- \$1,523,483 in total costs

The dynamic changes in coagulation after traumatic brain injury contribute to clinically significant and persistent morbidity. This study will elucidate the underlying mechanisms of post-traumatic hypercoagulability in order to reduce the detrimental effects of pathologic clot formation and organ dysfunction. Data from these studies will not only provide new insights into coagulation regulation, but also allow for novel therapeutic targets to reduce post-injury thromboembolic events.

RESEARCH GRANTS FY2018 *(continued)*

**Erin Haynes, DrPH**



Associate Professor,  
Department of  
Environmental Health

**“Development of a Lab on a Chip for Point of Care Biomonitoring of Blood Metals”**

- National Institute of Environmental Health Sciences Sub Award
- Grant runs from Jan. 1, 2017 to May 31, 2018
- \$161,160 in total costs

Dr. Haynes will lead the community-engaged research portion of the project and will provide expertise in manganese exposure and epidemiology. Dr. Haynes will form the connection between research participants within the Chicago community or other community sought to participate in the validation component of the blood metals sensor.

**Shuk Mei Ho, PhD**



Professor and Chair  
of the Department of  
Environmental Health  
and Director of the  
Cincinnati Cancer  
Center

**“Center for Environmental Genetics”**

- National Institute of Environmental Health Sciences P30
- Grant runs from April 1, 2018 to March 31, 2023
- \$8,031,291 in total costs

The vision of the Center for Environmental Genetics is to become a global leader in gene-environment interaction (GXE) research and translation. Its mission is to conduct innovative, multidisciplinary GXE research and translate discoveries to disease prevention via community empowerment, at home and around the globe. The center is a pioneer in GXE research.

**Christy Holland, PhD**



Professor, Department  
of Internal Medicine,  
Division of  
Cardiovascular Health  
and Disease and  
Director of Research,  
University of Cincinnati  
Heart, Lung and  
Vascular Institute

**“Echogenic Targeted Liposomes: Transfection/Drug Delivery”**

- National Heart, Lung and Blood Institute Sub Award
- Grant runs from April 15, 2017 to March 31, 2022
- \$1,329,156 in total costs

The overall research hypothesis is that initiation of sustained stable cavitation mediates payload delivery into the peripheral and coronary arterial beds. The long-term goals are to develop an easily translatable therapeutic carrier and enhanced delivery strategy, including novel U.S. transducer development to stabilize ATH beds at the time of intervention, overcoming difficulties with present strategies as well as improving ATH stabilization and physiologic flow.

## RESEARCH GRANTS FY2018 (continued)

**Michael Holliday, MD**

Assistant Professor,  
Department of Family  
and Community  
Medicine

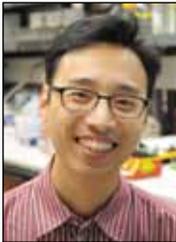
**“University of Cincinnati Cardiovascular Disease Collaborative”**

- Centers for Medicare and Medicaid Services Sub Award
- Grant runs from Oct. 4, 2017 to June 30, 2019
- \$358,840 in total costs

This project creates collaborative approaches to combat significant health care issues in local communities with respect to cardiovascular disease. Dr. Holliday will have overall responsibility for managing the UC cardiovascular disease curriculum development project and the UC collaboration team. He will attend curriculum meetings, review guidelines and existing curriculum and facilitate curriculum adoption and implementation.

**CO-INVESTIGATOR:**

**Barbara Tobias, MD**, Department of Family and Community Medicine

**Christian Hong, PhD**

Associate Professor,  
Department of  
Pharmacology and  
Systems Physiology

**“(PQ6) Roles of Circadian Rhythms in Tumor Development”**

- National Cancer Institute R21
- Grant runs from July 1, 2018 to June 30, 2020
- \$383,343 in total costs

Researchers will elucidate the consequence of the coupling between the circadian clock and cell cycle by integrating computational simulations and experimental validations, and determine whether circadian rhythms regulate cell proliferation and tumor development using mouse enteroids. Results will lay a foundation for identifying potential targets and temporal regimens to treat cancer.

**CO-INVESTIGATOR:**

**Tongli Zhang, PhD**, Department of Pharmacology and Systems Physiology

**Kristin Hudock, MD**

Assistant Professor,  
Department of Internal  
Medicine, Division of  
Pulmonary, Critical Care  
and Sleep Medicine

**“The NET Effect: Human CF Epithelial Responses to NETosis”**

- National Heart, Lung and Blood Institute K08
- Grant runs from Sept. 1, 2017 to Aug. 31, 2022
- \$846,560 in total costs

Neutrophils are immune cells that protect people against infection, but in cystic fibrosis (CF) neutrophils can cause damage to the lungs, which can lead to people with CF dying young. Researchers want to determine if and how neutrophil release of NETs (web-like traps) injures and kills lung cells. The goal of this work is to prevent lung damage in people with CF and help these people live longer.

RESEARCH GRANTS FY2018 *(continued)***Susan Kasper, PhD**

Associate Professor,  
Department of  
Environmental Health

**“Stathmin Phosphorylation as a Target for Blocking Metastasis in Prostate Cancer”**

- Department of the Army Medical Research Acquisition Activity Award
- Grant runs from Sept. 30, 2017 to Sept. 29, 2020
- \$929,662 in total costs

The overarching goal of this study is to leverage our current state of knowledge of the metastatic process to: 1) determine the predominant phospho-Stmn1 which controls the metastatic cascade in advancing prostate cancer metastasis; 2) use an innovative xenograft model in zebrafish to determine the efficacy of small molecule treatment in combination with androgen deprivation in blocking this cascade *in vivo*; 3) provide proof-of-principle that select phospho-Stmn1 isoforms are metastasis biomarker(s); and 4) identify potential novel biomarkers (identified by RNA-seq) that are selectively present in metastatic cells as compared to their non/low-metastatic control cells.

**Brett Kissela, MD**

Albert Barnes Voorheis  
Professor and  
Chair, Department  
of Neurology and  
Rehabilitation Medicine

**“VCID and Stroke in a Bi-racial National Cohort”**

- National Institute of Neurological Disorders and Stroke Sub Award
- Grant runs from Feb. 15, 2018 to Jan. 31, 2019
- \$194,662 in total costs

The REasons for Geographic And Racial Differences in Stroke (REGARDS) cohort of African-American and white participants was aged 45+ when they were recruited between 2003 and 2007. This cohort has been successfully followed at six months intervals for both surveillance of incident stroke events and longitudinal assessment of cognitive change. The current project will support the extension of surveillance of incident stroke events an additional five years; provide development, validation and application of a dementia endpoint; and conduct a nested case/cohort study of incident hypertension and diabetes contributing to the racial disparity in stroke risk.

**Scott Langevin, PhD**

Assistant Professor,  
Department of  
Environmental Health

**“Exosomal miRNA as Salivary Biomarkers for HPV+ Head and Neck Carcinoma”**

- National Institute of Dental and Craniofacial Research R21
- Grant runs from Sept. 1, 2017 to Aug. 31, 2019
- \$239,250 in total costs

There is an urgent need for development of novel biomarkers that can aid in early detection of head and neck squamous cell carcinoma (HNSCC) in order to improve patient outcomes. To address this, researchers propose to isolate exosomes from conditioned culture media from HPV+ HNSCC cell lines and primary oral epithelial cells, comprehensively sequence the small non-coding RNA contents and identify a candidate set of biomarkers that researchers will attempt to validate in saliva from patients with early stage HNSCC and cancer-free controls. Discovery and development of such novel HNSCC biomarkers will ultimately help to improve public health by reducing the burden of morbidity and mortality from this devastating disease.

RESEARCH GRANTS FY2018 *(continued)***Alex Lentsch, PhD**

Professor, Department  
of Surgery

**“Shriner’s Hospital Consulting Agreements, Calendar Year 2018”**

- Shriners Hospitals for Children – Cincinnati Award
- Grant runs from Jan. 1, 2018 to Dec. 31, 2018
- \$808,593 in total costs

Shriner’s funding provides for ongoing consulting work provided in accordance with the research being conducted at Shriner’s Hospital for Children and the University of Cincinnati.

**“Host Response to Trauma Research Training Program”**

- National Institute of General Medical Sciences T32
- Grant runs from July 1, 2018 to June 30, 2023
- \$1,344,925 in total costs

The fundamental purpose of this training program is to provide surgical residents and pediatric critical care medicine fellows with an intensive two-year research training experience that will prepare them for an academic career in trauma and critical care. This training program has evolved during the past 24 years into a highly structured and collaborative program that involves participants from multiple clinical and basic science disciplines. Trainees benefit from a team-based mentorship philosophy, outstanding institutional support and a broad range of educational opportunities.

**Michael Lyons, MD**

Associate Professor,  
Department of  
Emergency Medicine

**“HIV Prevention Activities”**

- Centers for Disease Control and Prevention Sub Award
- Grant runs from Jan. 1, 2018 to Dec. 31, 2018
- \$152,087 in total costs

The University of Cincinnati Early Intervention Program proposes to offer counseling, testing and referral services to the priority targeted populations in hospital and community settings and Prevention for Positives programs, which combines linkage to care services and anti-retroviral treatment and access to services interventions for new and previously diagnosed HIV-positive persons who are not currently receiving HIV medical treatment.

RESEARCH GRANTS FY2018 *(continued)*

**Susan Martelle, PhD**



Postdoctoral Fellow,  
Department of  
Psychiatry and  
Behavioral Neuroscience

**“The Role of Stress Hormones and Dopamine in a Novel Genetic Rat Model of PTSD”**

- Cohen Veterans Bioscience Award
- Grant runs from Oct. 27, 2017 to Oct. 26, 2018
- \$130,976 in total costs

This research integrates glucocorticoids (GC) signaling with another pathway — the dopaminergic system. Dopamine (DA), like GCs, is deeply involved in learning and memory. By creating novel rat strains that lack the ability to respond to GCs within DA signaling pathways in the brain, researchers will further clarify the role these two pathways have in directing behavioral stress responses as a result of exposure to SPS in early life. Specifically, researchers will investigate behavior in a test battery that encompasses core PTSD constructs: impaired emotional memory, social avoidance, anxiety, enhanced startle and neuroendocrine dysregulation.

**Francis McCormack, MD**



Gordon and Helen  
Hughes Taylor Chair and  
Professor, Department  
of Internal Medicine  
and Director, Division of  
Pulmonary, Critical Care  
and Sleep Medicine

**“Pulmonary Epithelial Dynamics and Innate Host Defense”**

- National Heart, Lung and Blood Institute R01
- Grant runs from Dec. 7, 2017 to Nov. 30, 2021
- \$1,950,859 in total costs

The research hypothesis is that key host factors, such as transient hyperoxia, render hosts susceptible to influenza pneumonia (IP) through their impact on the proliferative tone of the AECII pool. The goals of this project are to determine the mechanisms of mitogen-induced susceptibility to influenza A virus (IAV) susceptibility by completing three specific aims: mechanisms of mitogen-induced susceptibility of AECII cells to IAV infection; host states that affect IAV susceptibility through mitogenic effects on AECII cells; and genetic models of AECII signaling and anti-proliferative strategies for IAV prophylaxis and therapy. Successful completion of these aims will reveal the importance of a paradigm-shifting, AECII-centric host susceptibility mechanism, and suggest novel approaches to influenza prophylaxis and therapy.

**CO-INVESTIGATORS:**

**Michael Borchers, PhD**, Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine

**Jane Yu, PhD**, Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine

## RESEARCH GRANTS FY2018 (continued)

**William Miller, PhD**

Associate Professor,  
Department of  
Molecular Genetics,  
Biochemistry and  
Microbiology

**“Development of Salisphere-derived Systems for the Study of Cytomegalovirus vGPCR Directed Viral Growth in the Salivary Gland”**

- National Institute of Dental and Craniofacial Research R21
- Grant runs from Sept. 1, 2017 to August 31, 2019 and totals
- \$245,323 in total costs

Human cytomegalovirus infects the majority of the American people and, although it typically establishes a quiescent infection with little to no disease in most individuals, the virus is responsible for a variety of devastating sequelae in immunocompromised adults and in developing babies. Therefore, identifying the viral properties essential for replication, spread and horizontal transmission are important areas of medical science. These studies aim to use novel animal and cellular models to investigate the molecular mechanisms by which cytomegalovirus replicates in the salivary gland where it then gains access to fluids centrally important for horizontal transmission.

**CO-INVESTIGATOR:**

**Anil Menon, PhD**, Department of Molecular Genetics, Biochemistry and Microbiology

**“Mechanisms of vGPCR Mediated Cytomegalovirus Growth in the Salivary Gland”**

- National Institute of Allergy and Infectious Diseases R01
- Grant runs from July 1, 2018 to June 30, 2022
- \$1,267,247 in total costs

Human cytomegalovirus infects the majority of the American people and, although it typically establishes a quiescent infection with little to no disease in most individuals, the virus is responsible for a variety of devastating sequelae in immunocompromised adults and in developing babies. Therefore, identifying the viral properties essential for replication, spread and horizontal transmission are important areas of medical science. These studies aim to use novel animal and cellular models to investigate the molecular mechanisms by which cytomegalovirus replicates in the salivary gland where it then gains access to fluids centrally important for horizontal transmission.

## RESEARCH GRANTS FY2018 (continued)

**Latrice Montgomery, PhD**

Assistant Professor,  
Department of  
Psychiatry and  
Behavioral Neuroscience

**“Twitter-based Intervention for Young Adult African-American Blunt Smokers”**

- National Institute on Drug Abuse K23
- Grant runs from Aug. 15, 2017 to July 31, 2022 and totals
- \$726,280 in total costs

Approximately 40 percent of African-American marijuana smokers report heavy levels of past month blunt use (i.e., 21-30 days). Blunts are hollowed out tobacco cigar shells that are filled with marijuana. The combined use of tobacco and marijuana through blunts is a serious public health problem due to the increased risk of acquiring smoking-related diseases, and for developing a lifelong addiction to both of these substances. Thus, there is an urgent need for effective treatments to address tobacco and marijuana co-use, especially through the use of blunts. This project involves the development and evaluation of a low-cost, fully automated and accessible internet-based social media (i.e., Twitter) treatment intervention to help reduce blunt use among young African-American adults.

**David Norton, MD**

Associate Professor,  
Department of Internal  
Medicine, Division of  
Pulmonary, Critical Care  
and Sleep Medicine

**“PETAL Network: VIOLET – Vitamin D to Improve Outcomes by Leveraging Early Treatment”**

- National Heart, Lung and Blood Institute U01
- Grant runs from Feb. 1, 2017 to April 30, 2021
- \$121,103 in total costs

VIOLET will screen all patients for whom there is an intention to admit to an ICU for study eligibility and will approach patients meeting inclusion/exclusion criteria for study enrollment. Screening will require screening for vitamin D deficiency using an FDA-approved testing method for 25-hydroxyvitamin D [25OHD], either by the hospital's clinical laboratory or using the FastPack IP device. Written informed consent for screening/enrollment prior to the Vitamin D screening test will be obtained.

**Phillip Owens III, PhD**

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

**“The Role of Protease-activated Receptor 2 in Atherosclerosis”**

- National Heart, Lung and Blood Institute R01
- Grant runs from May 1, 2018 to March 31, 2023
- \$2,004,480 in total costs

The researchers' central hypothesis is that PAR2 regulates vascular smooth muscle cell (VSMC)-mediated pathology in atherosclerosis. Researchers will determine the molecular mechanism of PAR2-mediated VSMC transdifferentiation via activation of KLF4 and HuR and will determine the role of VSMC-specific PAR2 deletion and pharmacologic PAR2 inhibition in a relevant disease model of atherosclerosis. Together, these studies will increase the understanding of how PAR2 elicits atherosclerosis and may result in a novel therapeutic target to beneficially effect cardiovascular outcomes.

**CO-INVESTIGATOR:**

**Michael Tranter, PhD**, Department of Internal Medicine, Division of Cardiovascular Health and Disease

## RESEARCH GRANTS FY2018 (continued)

**Timothy Pritts, MD, PhD**

Professor, Department  
of Surgery

**“Attenuation of the Red Blood Cell Storage Lesion to Allow Extended Use of Previously Cryopreserved pRBC Units in Austere Environments”**

- Air Force Research Laboratory Award
- Grant runs from March 20, 2017 to March 19, 2020
- \$949,974 in total costs

The overall goal of this research is to attenuate the progression of the red blood cell storage lesion in previously cryopreserved packed red blood cell (pRBC) units. The research central hypothesis is that novel post-thaw treatments of previously cryopreserved pRBC units will inhibit components of the storage lesion over the ensuing 14-day post-thaw storage period.

**CO-INVESTIGATOR:**

**Amy Makley, MD**, Department of Surgery

**Alvaro Puga, PhD**

Professor, Department  
of Environmental Health

**“Molecular Mechanisms of Complex Mixture Toxicity”**

- National Institute of Environmental Health Sciences Award
- Grant runs from Sept. 30, 2017 to June 30, 2022
- \$445,504 in total costs

Environmental exposure to hexavalent chromium in drinking water and cigarette smoking and occupational exposure in the workplace are often compounded with concomitant exposures to aromatic hydrocarbon pro-carcinogens, resulting in health problems including lung, stomach and intestinal tract tumors. The objective of this research is to evaluate how hexavalent chromium disrupts the architecture of the genome and causes genotoxicity and carcinogenicity by deregulating gene expression. The knowledge derived from this research will identify molecular targets to reduce disease incidence and will significantly contribute to the development of therapeutic and preventative measures with major impact on the treatment of the diseases caused by these agents.

**Tiina Reponen, PhD**

Professor, Department  
of Environmental Health

**“Role of Measured and Observed Mold in the Development of Children’s Asthma”**

- Department of Housing and Urban Development Award
- Grant runs from Feb. 1, 2018 to Jan. 31, 2021
- \$670,000 in total costs

The goal of this study is to define more precisely the dose-response relationships between mold exposure in homes and adverse health outcomes, in order to support health-protective guidelines for indoor mold. Researchers hypothesize that refined metrics for observed mold and dampness will be associated with measured mold, and both of these will be associated with respiratory health in adolescent children. This research involves analyses, using data and samples from a retrospective cohort study, that capitalize on access to childhood respiratory health records and archived household dust samples from children participating in the Cincinnati Childhood Allergy and Air Pollution Study (CCAAPS), a well-defined birth cohort of high-risk children living in the Cincinnati and Northern Kentucky metropolitan area.

RESEARCH GRANTS FY2018 *(continued)***Sakthivel Sadayappan, PhD**

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

**“Myosin Binding Protein-C as a Target for Improving Cardiac Contractility in Heart Failure”**

- Merck Award
- Grant runs from Dec. 7, 2017 to Dec. 6, 2019
- \$300,000 in total costs

The long-term goal of this project is to define the roles of cardiac myosin binding protein-C structure, regulation and function in contractile function such that cardioprotection is the end point. The objective of the collaboration between MERCK and the Sadayappan Lab involves performing ex vivo and in vivo studies to understand the role of cardiac myosin binding protein-C in heart failure, using tool compounds that include peptides, small molecules and antibodies.

**Dylan Steen, MD**

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

**“Diagnosis and Characterization of Familial Hypercholesterolemia Using Data From the UK Biobank”**

- Amgen, Inc. Award
- Grant runs from Sept. 8, 2017 to Sept. 7, 2020
- \$367,505 in total costs

The genetic condition familial hypercholesterolemia is underdiagnosed in clinical practice leading to inadequate treatment as well as screening of family members of afflicted patients. A team of investigators from the University of Cincinnati, University of North Carolina, Harvard University and Cincinnati Children’s Hospital Medical Center have partnered with Amgen to evaluate the prevalence of familial hypercholesterolemia in the generalizable, prospectively enrolled 500,000-subject UK Biobank cohort. This database includes demographic and clinical data, family history, current medication use, genetics, laboratory assessments and detailed lifestyle information. The scope of the project will include performance assessment of traditionally recommended diagnostic tools.

**Thomas Thompson, PhD**

Professor, Department of Molecular Genetics, Biochemistry and Microbiology

**“Structural and Mechanistic Characterization of Intellitrap™ – Heteromeric Assembly of the Type I and Type II TGF Family Receptors Using an Fc Scaffold”**

- Acceleron Pharma, Inc. Award
- Grant runs from Sept. 28, 2017 to Sept. 27, 2018
- \$171,157 in total costs

Novel decoy receptors are being developed that can specifically neutralize subset of TGF ligands for muscle wasting and other disorders. Since TGF ligands use a combination of a Type II and Type I receptor to signal, the new decoy receptors are heteromeric and include the ligand binding domain of each receptor fused to an Fc platform. This research will elucidate the X-ray crystal structures of decoy receptors in complex with a growth factor ligand. These results will facilitate optimization and design of the next-generation of decoy receptors with increased affinity and desired specificity.

## RESEARCH GRANTS FY2018 (continued)

**Patrick Tso, PhD**

Professor, Department of Pathology and Laboratory Medicine

**“Evaluation of the Digestion, Uptake, Lymphatic and Portal Transport of Vitamin D in Different Delivery Vehicles Using a Lymph Fistula Rat Model”**

- Abbott Nutrition Award
- Grant runs from Dec. 1, 2017 to July 31, 2018
- \$198,813 in total costs

The major goal of the study is to determine the absorption and transport of vitamin D<sub>3</sub> by the gastrointestinal tract. Vitamin D is mostly carried by chylomicrons but it can also be transported in the portal circulation. Using conscious animals with both the intestinal lymphatic duct and the portal vein cannulated, researchers will be able to determine the partitioning of vitamin D<sub>3</sub> between the lymphatic and the portal route. Researchers also will be able to determine factors affecting the relative partitioning between these two routes of vitamin D<sub>3</sub> transport.

**Kyle Walsh, MD**

Assistant Professor, Department of Emergency Medicine

**“SBIR Phase II: Novel Device for Monitoring Brain Hemorrhage Using Radio Waves”**

- National Science Foundation Award
- Grant runs from June 1, 2017 to May 31, 2018
- \$127,396 in total costs

In this contracted work between SENSE Diagnostics, LLC and the University of Cincinnati, a new prototype procured and owned by SENSE Diagnostics will be characterized. This work will involve the use of a porcine intracerebral hemorrhage model. The sensitivity and detection capabilities of the SENSE device will be measured and quantified using previously developed techniques at UC.

**Hong-Sheng Wang, PhD**

Associate Professor, Department of Pharmacology and Systems Physiology

**“Endocrine Disruptors and Heart Health”**

- National Institute of Environmental Health Sciences R0
- Grant runs from Feb. 1, 2018 to Jan. 31, 2023
- \$1,974,426 in total costs

There is near-ubiquitous human exposure to the environmental xenobiotic bisphenol A (BPA). These studies investigate the toxicological effects and underlying mechanism of BPA and its analog bisphenol S (BPS) that pertain to human heart health. These studies will have significant impact on the understanding of the adverse health effects of BPA and BPS exposure. These studies have high clinical relevance, particularly with respect to arrhythmias in human patients with existing cardiac abnormalities.

**CO-INVESTIGATORS:**

**Susan Pinney, PhD**, Department of Environmental Health  
**Jack Rubinstein, MD**, Department of Internal Medicine, Division of Cardiovascular Health and Disease  
**Changchun Xie, PhD**, Department of Environmental Health

RESEARCH GRANTS FY2018 (continued)

**Theresa Winhusen, PhD**



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

**“EMPOWER: Evaluating the ability to reduce Morphine equivalent dose for chronic Pain patients receiving Opioid-therapy through a Web-based E-Health self-management program: a Randomized multi-site Clinical Trial”**

- National Institute on Drug Abuse R01
- Grant runs from Sept. 1, 2017 to June 30, 2022
- \$2,480,792 in total costs

Specific aims for this research are to conduct a randomized clinical trial comparing E-health+ to treatment as usual (TAU) and test the conceptual model of E-health’s mechanisms of change, including hypothesized mediators (i.e., pain self-efficacy, coping strategies, knowledge about pain/opioid therapy and stress) and moderators (neurocognitive function: executive function and verbal learning ability) of E-health’s impact on decreasing MED and pain intensity.

**Meifeng Xu, MD, PhD**

Associate Professor, Department of Pathology and Laboratory Medicine

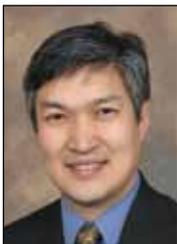


**“Smarter Exosomes Derived From Engineered MSCs Promote Neovascularization”**

- National Heart, Lung and Blood Institute R01
- Grant runs from March 15, 2018 to Jan. 31, 2022
- \$2,017,291 in total costs

This study aims to study if smarter small vesicles released from the genome-edited stem cells will extraordinarily promote blood vessel formation, resulting in repair of a damaged heart via delivering the enriched pro-angiogenic molecules. The success of the research will explore a new paradigm for highly effective therapy of ischemic heart disease with stem cell products.

**Daniel Woo, MD**



Professor, Department of Neurology and Rehabilitation Medicine

**ICH Recovery Grant**

- National Institute of Neurological Disorders and Stroke R01
- Grant runs from Aug. 1, 2017 to April 30, 2022
- \$5,344,144 in total costs

This research performs detailed cognitive, motor and functional assessments on cases of intracerebral hemorrhage (ICH) and correlates with tractography imaging. Researchers hypothesize that unlike ischemic stroke, the mass effect of the hemorrhage itself may disrupt nearby tracts in some patients while preserving them in others and will serve as a better predictor of who may recover after ICH. This project will represent the largest number of ICH cases in which tractography imaging has been performed to date.

RESEARCH GRANTS FY2018 *(continued)***Daniel Woo, MD**

Professor, Department of Neurology and Rehabilitation Medicine  
*(continued)*

**“Cincinnati Neuroscience Clinical Trials Research Center (CinciNEXT)”**

- National Institute of Neurological Disorders and Stroke U24
- Grant runs from July 1, 2018 to June 30, 2023
- \$1,612,000 in total costs

CinciNEXT is a unique collaboration between the freestanding Cincinnati Children’s Hospital Medical Center and the University of Cincinnati that aims to continue to be a clinical site in the NINDS-funded Network for Excellence in Neuroscience Clinical Trials (NeuroNEXT) network. The objective of this project is to secure the infrastructural support needed to maintain the outstanding quality of clinical trials that the CinciNEXT site has conducted for the NeuroNEXT Network during the first cycle of support. Specific goals of CinciNEXT include streamlining startup, enhancing recruitment, maximizing retention and optimizing study conduct of NeuroNEXT Network studies.

**Bruce Yacyshyn, MD**

Professor, Department of Internal Medicine,  
Division of Digestive Diseases

**“How Does Passive Immunoglobulin Effect *C. difficile* Toxin A and B Binding and Host Barrier Response?”**

- Merck Award
- Grant runs from Oct. 17, 2017 to Oct. 16, 2019
- \$189,607 in total costs

**Mary Beth Yacyshyn, PhD**

Adjunct Associate Professor, Department  
of Internal Medicine, Division of Digestive  
Diseases



Clostridium difficile infection (CDI) is a prominent nosocomial infection and is an increasing burden to the health care system. Toxins are the causative agents in the infection. Several new non-antibiotic therapies are becoming available which focus on the humoral immune system. Effectiveness of anti-toxin therapy (passive immunoglobulin) may be due to availability of host toxin binding sites and the roles each toxin plays in the intoxication process. Host luminal glycoprotein and glycolipid structures may alter availability of anti-toxin binding sites. Using an in vitro enteroid system, generated from human colon biopsies, researchers will study the epithelial cell targets, timing and effectiveness of anti-TcdA and TcdB antibodies in the presence of TcdA and TcdB. This will help patients with recurrent CDI using this additional treatment strategy.

RESEARCH GRANTS FY2018 (continued)

**Jane Yu, PhD**



Associate Professor,  
Department of Internal  
Medicine, Division of  
Pulmonary, Critical Care  
and Sleep Medicine

**“Targeting Prostaglandin Biosynthesis and Action in Lymphangioliomyomatosis”**

- Lymphangioliomyomatosis Foundation (LAM) Award
- Grant runs from July 1, 2017 to June 30, 2018
- \$150,000 in total costs

The premise of this study is to improve upon the currently available suppressive treatment regimen with sirolimus alone. If successful, the combination of sirolimus and aspirin may provide a remission-inducing treatment option, and even open up the possibility of sirolimus withdrawal at a later stage.

**“Targeting Prostaglandin Biosynthesis and Action in Lymphangioliomyomatosis”**

- National Heart, Lung and Blood Institute R01
- Grant runs from Aug. 1, 2017 to June 30, 2020
- \$1,843,109 in total costs

The significance of this project is that it will reveal for the first time how estrogen contributes to the destructive lung remodeling and pulmonary functional decline. This study will have high impact because Lymphangioliomyomatosis (LAM) progresses much more rapidly in women with an intact estrogen axis and results in respiratory failure and death. Despite many advances in understanding mTOR-dependent pathways, there remains a critical need for more effective therapeutic options for women with LAM.

**CO-INVESTIGATORS:**

**Nishant Gupta, MD**, Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine

**Shuk Mei Ho, PhD**, Department of Environmental Health

**Francis McCormack, MD**, Department of Internal Medicine, Division of Pulmonary, Critical Care, and Sleep Medicine

## Clinical Trials Revenue FY 2018

### Opeolu Adeoye, MD



Associate Professor  
Co-Director, UC Stroke  
Team  
Department of  
Emergency Medicine

Dr. Adeoye's clinical trial work is focused on the development and testing of new treatments for stroke and traumatic brain injury (TBI). His work spans emergent diagnosis of stroke or TBI using blood biomarkers, as well as interventional clinical trials that test different novel treatments against standard approaches to therapy. He has also conducted studies using a new medical device to inform stroke diagnosis. Dr. Adeoye's works with a highly collaborative team spanning emergency medicine, stroke neurology, trauma, neurocritical care, general critical care, neurosurgery and radiology. He and his team hope to continue to expand upon multi-disciplinary efforts.

**FY2018 REVENUE: \$111,450**

### Caleb Adler, MD



Professor  
Department  
of Psychiatry  
and Behavioral  
Neuroscience

Dr. Adler's clinical trial work has focused on the treatment of mood and other psychiatric disorders, including bipolar disorder, schizophrenia and ADHD. In addition to sponsored clinical trials, he recently completed a dual-site investigator-initiated study of bipolar depression and has contributed to the dissemination of research findings for other bipolar medications.

**FY2018 REVENUE: \$418,546**

### Rita Alloway, PharmD



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

The Transplant Clinical Research Program conducts industry-funded clinical trials in transplant recipients and candidates to identify novel immunosuppressants with improved efficacy and safety. In addition, several trials are ongoing which address unmet needs related to infectious complications post transplant and reperfusion injury. The program is currently running five investigator-sponsored trials and eight industry sponsored trials. The BEST study is a multicenter, 315 patient study with an investigational new drug (IND) application which evaluates the safety and efficacy of simultaneous steroid withdrawal and calcineurin free immunosuppression. The one year results have shown that simultaneous steroid withdrawal with belatacept results in acceptable post transplant outcomes without worsening nephrotoxicity, neurotoxicity or post transplant diabetes. These clinical trials also include mechanistic and translational studies of peripheral blood and renal biopsy tissue utilizing state-of-the-art flow cytometry, single cell genomics, intracellular protein biochemistry and ex vivo approaches to advance our understanding of the key elements of rejection and post transplant diabetes. This team maintains a renal biopsy biobank from which samples have been utilized to obtain federal funding for innovative mechanistic studies which translate to novel therapies. Cytomegalovirus infection remains a difficult to treat post transplant complication. They are evaluating a new CMV vaccine and an alternative CMV antiviral which may minimize this post transplant complication.

**FY2018 REVENUE: \$184,693**

CLINICAL TRIALS REVENUE FY2018 *(continued)***Lesley Mussio Arnold, MD**

Professor  
Director, Women's  
Health Research  
Program  
Department of  
Psychiatry and  
Behavioral Neuroscience

Dr. Arnold is the director of the Women's Health Research Program (WHRP) in the Department of Psychiatry and Behavioral Neuroscience at the University of Cincinnati College of Medicine and focuses on research studies of health problems that are of particular concern to women and are at the medicine-psychiatry interface. The WHRP is a leading research center in the study of chronic pain disorders including fibromyalgia, migraine, chronic low back pain, osteoarthritis pain, and neuropathy. She has over 25 years' experience leading medication trials in chronic pain, designing clinical trial protocols, and developing patient-reported outcome measures. As part of the effort to discover new non-opioid medical treatments for chronic pain and improve the assessment of pain for clinical trials, Dr. Arnold is conducting functional neuroimaging studies of chronic pain mechanisms.

**FY2018 REVENUE: \$465,206**

**Robert Baughman, MD**

Professor  
Department of Internal  
Medicine

Dr. Baughman runs the sarcoidosis clinic at University of Cincinnati. The clinic registry includes over 2200 patients and sees nearly a thousand patients a year. Along with his long time collaborator Dr. Elyse Lower, he has developed several novel treatments for sarcoidosis, including methotrexate, thalidomide, leflunomide, infliximab, rituximab, and repository corticotrophin. This group has led several double blind placebo controlled trials in sarcoidosis. Current studies include treatments for pulmonary, ocular, and cutaneous sarcoidosis. He also is studying sarcoidosis associated fibrosis, pulmonary hypertension and fatigue.

**FY2018 REVENUE: \$220,601**

**Melissa DelBello, MD, MS**

Professor and Chair  
Department of  
Psychiatry and  
Behavioral Neuroscience

Dr. DelBello investigates risk and resilience factors associated with the development of mood disorder in children and adolescents. Additionally, their group examines novel short- and long-term intervention and prevention strategies for youth with and at risk for mood disorders and attention deficit hyperactivity disorder by combining outcome studies, clinical trials and neuroimaging research.

**FY2018 REVENUE: \$255,324**

**Alberto Espay, MD, MSc**

Professor  
Director and Chair  
Department of  
Neurology and  
Rehabilitation Medicine

The James J and Joan A. Gardner Center for Parkinson's disease and Movement Disorders is involved in therapeutic trials of compounds to lessen symptom burden and slow progression in Parkinson's and Huntington's diseases.

**FY2018 REVENUE: \$642,613**

**CLINICAL TRIALS REVENUE FY2018** *(continued)***Gregory Fermann, MD**

Professor, Vice Chairman  
Department of  
Emergency Medicine

Dr. Fermann is the Founder and Director of the Clinical Trials Center (CTC) in the Department of Emergency Medicine. The CTC is responsible for supporting the screening and recruitment of subjects for industry, foundation and NIH sponsored drug, device and diagnostic clinical trials. The trials focus on novel applications and new platforms of established cardiovascular diagnostics used in risk stratification of patients with emergent conditions. For instance, the TACIT trial sponsored by Roche evaluated the use of high sensitivity cardiac troponin T in patients with acute heart failure.

Dr. Fermann is the Chief Investigator of the multicenter clinical trial MAGNET ACS-US that evaluates a portable magnetocardiographic device called VitalScan for the diagnosis of acute coronary syndrome in ED patients presenting with chest pain and dyspnea. He is the PI of pivotal trials such as ANNEXA-4, the study of the reversal agent for Direct Acting Oral Anticoagulants. He is on the national steering committee of several multicenter trials such as QUANTUM-AF (improving the under treatment of patients with AF), SOAR registry (evaluating the impact of DOAC related hemorrhage) and GUIDED HF (PCORI sponsored trial of intensified treatment and follow up in patients discharged from the ED with AHF). He is the site PI of the AURORA trial sponsored by NIMH evaluating patients presenting with acute trauma and the development of posttraumatic syndromes. Dr. Fermann has had continuous funding through the CTC since it was founded in 2009 and won the inaugural "Clinical Trialist of the Year" award in 2016.

**FY2018 REVENUE: \$295,305**

**Lawrence Goldstick, MD**

Associate Professor  
Department of  
Neurology and  
Rehabilitation Medicine

Over the course of the last several years Dr. Goldstick and his team have been actively involved in clinical trials mainly pharmacological trials and NIH trials to a more limited extent. Dr. Goldstick and his team's main involvement has been with multiple sclerosis trials but have also been involved with Alzheimer's trials and NIH headache trials. Dr. Goldstick has been involved in 15 to 20 multiple sclerosis trials, 5-10 Alzheimer's trials and headache trials. Recent trials involve new treatments for relapses, comparator studies of monomethyl fumarate and dimethyl fumarate, initial treatment with ocrelizumab as initial therapy and recent onset of multiple sclerosis, and utilization of remyelinating agents in combination with immunomodulating therapies in the treatment of multiple sclerosis. Other studies have been involved utilization of S1 P1 receptor agonists in the treatment of secondary progressive MS. Dr. Goldstick and his team are currently starting a study utilizing extended interval dosing of natalizumab looking at efficacy measures and decrease in incidence of PML in JC positive patients. Further studies have included studies of monoclonal antibodies directed at amyloid in Alzheimer's disease, beta secretase inhibitors in Alzheimer's disease, and utilization of Tau therapies in Alzheimer's disease. Further studies include an NIH Picori study looking at different treatment algorithms in medication overuse syndromes.

**FY2018 REVENUE: \$840,864**

CLINICAL TRIALS REVENUE FY2018 *(continued)***Natalie P. Kreitzer, MD**

Assistant Professor  
Department of  
Emergency Medicine

Dr. Kreitzer's clinical trial work has focused on the diagnosis of concussion in the emergency department. She has worked closely with the Jan Medical team to determine if the Brain Pulse, a non-invasive neuromonitoring device, is able to recognize differences between patients who are concussed and non-concussed. Her industry-funded study at UC is a non-blinded study to design an algorithm for the device for use as an aid in the diagnosis of concussion.

**FY2018 REVENUE: \$117,972**

**Michael Lyons, MD, MPH**

Associate Professor,  
Director, Early  
Intervention Program  
Department of  
Emergency Medicine

Dr. Lyons' clinical trial work has focused on implementation of HIV and Hepatitis C screening and linkage to care by the Early Intervention Program in the emergency department (ED) of UC Medical Center. EDs are primarily focused on acute care and do not conventionally endorse a prevention mission. The Early Intervention Program was created in 1998 to expand the EDs focus to include public health and prevention services. Recent goals include building infrastructure to more fully integrate HIV/HCV screening into usual practice, bolstering linkage to care support for newly and previously diagnosed patients, and using the electronic health record to target patients that have not been linked or have fallen out of care.

**FY2018 REVENUE: \$288,949**

**Joseph Moellman, MD**

Professor  
Department of  
Emergency Medicine

Dr. Moellman's major focus of interest has been in the emergency management of allergy and immunology conditions. More specifically, in collaboration with his mentor, Dr. Jonathan Bernstein (UC Division of Allergy and Immunology), the major focus of his study has revolved around the treatment of patients with angioedema including hereditary angioedema (HAE) and ace-inhibitor angioedema. He has been involved in various industry sponsored trials exploring various pharmaceutical treatment of such conditions. A highlight of completing such trials culminated in an emergency department consensus parameter document which was the first published document guiding emergency physicians in the treatment of such patients. Other studies conducted explored the use of real-time penicillin allergy testing in emergency department patients to determine the accuracy of self-reported penicillin allergy. Most recently, he has participated in a multi-center trial comparing intravenous cetirizine to diphenhydramine in patients with acute urticaria.

**FY2018 REVENUE: \$145,909**

CLINICAL TRIALS REVENUE FY2018 *(continued)***John Morris, MD**

Professor  
Co-Director,  
Comprehensive Lung  
Cancer Center  
Associate Director, UCCI  
Translational Research  
Director, Experimental  
Therapeutics  
Department of Internal  
Medicine, Division of  
Hematology Oncology

Dr. Morris' efforts focus on early stage clinical trials of new anticancer agents. He directs the Experimental Therapeutics/Phase I Cancer Drug Program for the Division of Hematology Oncology. Phase I trials are the early stage testing of new drugs or drug combinations in patients with advanced cancer. The goal of these trials is to determine a drug's safety, its side effects, the maximum tolerated dose of a new, often untested, drug in patients, and its activity against the patient's cancer. In recent years, there have been numerous advances in the treatment of cancer that have greatly impacted patient's lives. The early phase testing of some of these drugs was carried out in a novel program at UC. Some studies have been first-in-human testing or a new agent as exemplified by the BQX-350 trial. BQX-350 is a drug developed at UC by Xiaoyang Qi, PhD, that combines saponin C, a natural glycoside that activates cell death pathways and DOPS, lipid that forms nanovesicles with the saponin C that targets saponin to tumor cells and blood vessels that feed tumors. The BQX-350 trial sponsored by Bexion Pharmaceuticals carried out at UC and three other cancer centers nationally, successfully completed patient safety testing in under a year and is now being expanded. Crucial to this was the rapid recruitment of patient volunteers at UC. Other early phase clinical trials carried out in the UC Phase I/Experimental Therapeutics Program include testing of an oral form of 5-azacytidine for the treatment of myelodysplasia and acute leukemias, a dual mTOR inhibitor, BEZ235 in combination with everolimus another mTOR inhibitor for treatment of refractory solid tumors, novel immuno-oncology drugs and vaccines that stimulate the immune system to attack cancers, and novel targeted agents, among others. Dr. Morris directs the only formal Experimental Therapeutics/Phase I Program in the region offering new, novel and state of the art experimental drugs to tri-state residents. His personal research interests are in development of cancer vaccines, and an immunostimulatory cytokine, interleukin-15 for the treatment of cancer.

**FY2018 REVENUE: \$791,651**

**Erik B. Nelson, MD**

Associate Professor  
Department of  
Psychiatry and  
Behavioral Neuroscience

Dr. Nelson is Director for The Depression Research Program within the Department of Psychiatry and Behavioral Neuroscience and is dedicated to furthering an understanding of depressive disorders, including studies of new treatments for depression and the biological underpinnings of these disorders. Dr. Nelson's specific interests include trials investigating new psychopharmacological treatments for depression, studies of abnormalities of the stress response in depression, and identifying biomarkers of subtypes of depression using neuroimaging techniques and measures of the stress response system.

**FY2018 REVENUE: \$273,866**

CLINICAL TRIALS REVENUE FY2018 *(continued)***Shimul Shah, MD**

Professor  
Department of Surgery

Dr. Shah and his team's research efforts have focused on improving outcomes and safety in surgery. As such, Dr. Shah leads the Cincinnati Research on Outcomes and Safety in Surgery (CROSS). In order to improve outcomes following transplantation, his team has recently completed a trial of a telehealth platform to care for patients between clinic visits following transplantation. In addition, Dr. Shah's clinical research projects have included alternative immunosuppressive regimens to preserve kidney function after liver transplantation and, with Drs. Luckett, Anwar, Kaiser and their teams, he has pioneered the use of hepatitis C positive (antibody and viremic) donors at UC and in the United States. Following careful planning, Dr. Shah will also initiate the use of cold machine perfusion of liver allografts at UC by being the first in the United States to use a novel transportable cold perfusion system. This system may lead to improved liver allograft function and, in turn, post-operative outcomes for liver transplant recipients.

**FY2018 REVENUE: \$235,037**

**Kenneth Sherman, MD, PhD**

Professor  
Division Director  
Department of Internal  
Medicine, Division of  
Digestive Diseases

The Hepatitis Research Group and its clinical study arm is focused on a variety of research trials related to the treatment of hepatitis C, hepatitis B, NAFLD/NASH and PSC. Over the last year Dr. Sherman and his team continued to be a leading enroller in a PCORI trial, evaluating the real-world effectiveness of medications used to treat hepatitis C. Dr. Sherman and his team completed exploratory studies on therapeutic vaccination for hepatitis B, and have embarked on study of a variety of targets related to fatty liver disease (NAFLD/NASH) to address the national epidemic being driving by rising obesity in the United States.

**FY2018 REVENUE: \$215,128**

**Jeffrey Strawn, MD**

Associate Professor  
Director, Anxiety  
Disorders Research  
Program  
Department of  
Psychiatry and  
Behavioral Neuroscience

Dr. Jeffrey Strawn's clinical trial work focuses on the treatment of anxiety and related disorders in children and adolescents. His clinical trials work led to the first FDA-approval of a medication treatment for pediatric anxiety (duloxetine). His clinical trials program evaluates medications with novel mechanisms of action in youth with depressive and anxiety disorders, explores the pharmacokinetics of these medications in pediatric patients and has also begun to evaluate the tolerability and efficacy of neuromodulation in adolescents with depressive disorders. Finally, with his collaborators, Dr. Strawn publishes on clinical trial design, placebo response, signal detection and novel analytic strategies for pediatric clinical trials.

**FY2018 REVENUE: \$258,812**

**CLINICAL TRIALS REVENUE FY2018** *(continued)***Michael Thomas, MD**

Professor  
 Director, Division  
 of Reproductive  
 Endocrinology and  
 Infertility  
 Department of  
 Obstetrics and  
 Gynecology

Dr. Thomas' clinical research has focused on the development of new and innovate contraceptive devices. Dr. Thomas has been involved with contraceptive clinical trials at the University of Cincinnati College of Medicine since 1988. He became one of the first Principal Investigators in the National Institutes of Health's Contraceptive Clinical Trials Network (CCTN) when it was first awarded in 1995. Since that time, he has continued to competitively renew this contract. Over the years, the CCTN has studied intrauterine devices, emergency contraceptives, vaginal rings, patches, and various pill formulations. In addition, Dr. Thomas has worked on clinical trials in the area of menopause, polycystic ovary syndrome, endometriosis, and amenorrhea. He and his staff are currently collaborating with the the Department of Environmental Health on the effect of environmental toxins on sperm, oocyte and embryo development.

**FY2018 REVENUE: \$276,966**

**Trisha Wise-Draper, MD, PhD**

Assistant Professor  
 Medical Director, UCCI  
 Clinical Trials Office  
 Department of Internal  
 Medicine, Division of  
 Hematology Oncology

Dr. Wise-Draper's clinical research program has largely focused on immunotherapy for head and neck cancer (HNC) as well as experimental therapeutics. She developed one of the first therapeutic window studies for a PD-1 inhibitor (pembrolizumab) in HNC which is an industry funded investigator initiated multi-site phase II study which shows great promise for new therapeutic strategies in surgically resectable patients and has gained national attention. Samples from this study will help several researchers understand how patients both respond and become resistant to immunotherapy with the goal leading to better combinations in the future. In addition, Dr. Wise-Draper has contributed to clinical studies using other novel targets in HNC including CDK inhibitors, STAT3 antisense molecules, nanoparticles containing cisplatin, CTLA inhibitors, PD-L1 inhibitors as well as new phase I targets in multiple tumors including antibody conjugated drugs to HER2, CD73 antibody and a wee-1 inhibitor.

**FY2018 REVENUE: \$392,395**

**Steve Woodle, MD**

Professor  
 Director, Solid Organ  
 Transplantation  
 Director, Israel Penn  
 Center for Transplant  
 Oncology  
 Department of  
 Surgery, Division of  
 Transplantation

Dr. Woodle's research projects are part of the transplant clinical trials team collaborative effort with Drs. Alloway and Tremblay. He currently holds four IND applications, in addition to having federally funded translational transplant projects. The Belatacept Early Steroid Withdrawal Trial (BEST) is perhaps this year's most notable industry-funded, investigator-initiated accomplishment for the transplant clinical research team. The BEST trial was a multicenter, randomized, controlled trial of 315 de novo kidney transplant recipients testing two calcineurin inhibitor and corticosteroid-free regimens (belatacept-based) to a control arm including a calcineurin inhibitor (tacrolimus) with a 2 year follow-up that was completed in December 2018. This is the only successful large controlled clinical trial that has been completed evaluating these regimens. With this trial, Dr. Woodle and his team were able to demonstrate that the simultaneous avoidance of calcineurin inhibitors and corticosteroids led to a similar efficacy but improved electrolyte, metabolic and neurotoxicity safety profiles when compared to the standard of care regimen administered to more than 95% of kidney transplant recipients in the United States.

**FY2018 REVENUE: \$186,143**

CLINICAL TRIALS REVENUE FY2018 *(continued)***Bruce Yacyshyn, MD**

Professor  
Department of Internal  
Medicine, Division of  
Digestive Diseases

Early phase clinical trials in gut inflammation, including inflammatory bowel disease and *Clostridium difficile*. Dr. Yacyshyn and his team have participated in early phase clinical development building upon our Industry and FDA experience in the expansion of potentially pre-emptive and personalized medicine for Crohn's disease and ulcerative colitis. Dr. Yacyshyn and his team's work has included studies focusing on JAK, SMAD, sphingosine phosphates, anti-adhesion therapies and non-opioid pain management. Their *Clostridium difficile* work has included vaccines, novel antibiotics and FMT replacements. Their team has led in development of new technologies and approaches including antisense RNA, biomarkers and anti-adhesion strategies.

**FY2018 REVENUE: \$375,687**

**Aram Zabeti, MD**

Assistant Professor and  
Division Director for  
Multiple Sclerosis  
Department of  
Neurology and  
Rehabilitation Medicine

Dr. Zabeti is a PI of CHORDS clinical trial which is "an open label study to evaluate the effectiveness and safety of ocrelizumab in patients with relapsing remitting multiple sclerosis (MS) who have had a suboptimal response to an adequate course of disease modifying treatment."

Ocrelizumab is the latest FDA approved therapy for MS and the first and only medication approved for both the relapsing remitting form as well as the primary progressive form of MS. Ocrelizumab is an infusible monoclonal antibody targeting the CD20 lymphocyte which is given every 6 months, effectively preventing new MRI lesions, relapses and future disabilities. Since its approval in March 2017, there have been 50,000 patients treated with the medication. Researchers have enrolled 10 patients in CHORDS, some of which have already completed the study and the rest of them will within the next few months. This study has helped to collect safety and efficacy data about this important medication.

**FY2018 REVENUE: \$127,253**

## Other Faculty Grants FY 2018

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Zalfa Abdel-Malek, PhD	Department of Dermatology	MC1R-selective Small Melanocortin Analogs for Melanoma Prevention	Melanoma Research Foundation
Zalfa Abdel-Malek, PhD	Department of Dermatology	Breaking Down the Matrix in the Melanoma Microenvironment: Mechanism and Therapeutic Evaluation	National Cancer Institute
Opeolu Adeoye, MD	Department of Emergency Medicine	Strategies to Innovate EmeRgENcy Care Clinical Trials Network (SIREN)	National Institute of Neurological Disorders and Stroke
Opeolu Adeoye, MD	Department of Emergency Medicine	TBI Endpoints Development (TED)	University of California, San Francisco
Opeolu Adeoye, MD	Department of Emergency Medicine	POINT: Platelet-Oriented Inhibition in New TIA	University of Michigan
Opeolu Adeoye, MD	Department of Radiology	Multi-arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial	National Institute of Neurological Disorders and Stroke
Opeolu Adeoye, MD	Department of Emergency Medicine	Multi-arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial	National Institute of Neurological Disorders and Stroke
Syed Ahmad, MD	Department of Surgery, Section of Surgical Oncology	Disrupting Tissue Factor-beta1 Integrin Axis in Pancreatic Cancer	Pancreatic Cancer Network
Syed Ahmad, MD	Department of Surgery	Advancing Treatment for Pancreatitis: A Prospective Observational Study of TPIAT	Regents of the University of Minnesota
Syed Ahmad, MD	Department of Surgery	SWOG Network Group Operations Center of the NCTN	Oregon Health Sciences University and Hospital
Syed Ahmad, MD	Department of Surgery, Section of Surgical Oncology	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Eitaro Aihara, PhD	Department of Pharmacology and Systems Physiology	2018 S&R Foundation Ryuji Ueno Award	American Physiological Society
Nira Ben-Jonathan, PhD	Department of Cancer Biology	Novel Treatments for Head and Neck Cancer Using FDA-approved Drugs	Brandon C. Gromada Head and Neck Cancer Foundation
Justin Benoit, MD, MS	Department of Emergency Medicine	ACCESS to the Cardiac Catheterization Laboratory in Patients Without ST-segment Elevation Myocardial Infarction Resuscitated From Out-of-hospital Ventricular Fibrillation Cardiac Arrest	Regents of the University of Minnesota
Thomas Blakeman, MSc	Department of Surgery	Maximizing Oxygen Delivery Across Deployed Services	Air Force Research Laboratory
Vladimir Bogdanov, PhD	Department of Internal Medicine, Division of Hematology Oncology	Disrupting Tissue Factor-beta1 Integrin Axis in Pancreatic Cancer	Pancreatic Cancer Network
Raymond E. Boissy, PhD	Department of Dermatology	P&G Contract - GALECTIN-3 Regulation Study	Cincinnati Children's Hospital Medical Center

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Michael Borchers, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Pulmonary Epithelial Dynamics and Innate Host Defense	National Heart, Lung and Blood Institute
Michael Borchers, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Natural Killer Cell Phenotype and Function in Lymphangi leiomyomatosis	Lymphangi leiomyomatosis Foundation (LAM)
Steven Boyce, PhD	Department of Surgery	Reprogramming the Dermal Microenvironment to Induce Hair Follicle Neogenesis in Engineered Skin	National Institute of Arthritis, Musculoskeletal and Skin Disease
Richard Branson, MS, RRT	Department of Surgery	Maximizing Oxygen Delivery Across Deployed Services	Air Force Research Laboratory
Joseph Broderick, MD	Department of Neurology and Rehabilitation Medicine	AtRial Cardiopathy and Antithrombotic Drugs In prevention After cryptogenic stroke (ARCADIA)	Columbia University
Joseph Broderick, MD	Department of Neurology and Rehabilitation Medicine	Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	Columbia University
Joseph Broderick, MD	Department of Neurology and Rehabilitation Medicine	Multi-arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial	National Institute of Neurological Disorders and Stroke
Joseph Broderick, MD	Department of Neurology and Rehabilitation Medicine	The Role of Collagen COL22A1 in Intracranial Aneurysms and Vascular Stability	Cincinnati Children's Hospital Medical Center
Jennifer Brown, PhD	Department of Psychiatry and Behavioral Neuroscience	Computer-Based Alcohol Reduction Intervention for Alcohol-Using HIV/HCV+ Russian Women in Clinical Care	Emory University
Charles Caldwell, PhD	Department of Surgery	Role of Acid Sphingomyelinase in the Modulation of Coagulation After Traumatic Brain Injury	National Institute of General Medical Sciences
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	General Services Agreement.	Terumo BCT, Inc.
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	Clinical Investigation to Evaluate the New Health Sciences Hemanext Oxygen Reduction System	New Health Sciences, Inc.
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	Amicore Apheresis System: In Vitro Evaluation of Triple Platelet Products Stored for Five Days in 100% Plasma	Fenwal
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	General Services Master Agreement	Terumo BCT, Inc.
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	Dose Escalation Study Design	New Health Sciences, Inc.
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	Identification of Viable, Alloreactive T-cells in Thrombocyte Products	Cellphire, Inc.

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	Verification Protocol for in vitro Cell Quality of Mirasol-Treated Platelets in 100% Plasma Collected on Trima Accel	Terumo BCT, Inc.
Jose Cancelas-Perez, MD, PhD	Hoxworth Blood Center	A Phase 1, Multi-Center, Open-Label, Dose Escalation Study of Thrombosomes in Bleeding Thrombocytopenic Patients in Three Cohorts.	Cellphire, Inc.
Seetharam Chadalavada, MD	Department of Radiology, Section of Interventional Radiology	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Aimin Chen, MD, PhD	Department of Environmental Health	Developmental Neurotoxicity of Organophosphate and Novel Brominated Flame Retardants in Children	National Institute of Environmental Health Sciences
K. Ann Choe, MD	Department of Radiology, Section of Abdominal Imaging	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Heather Christensen, PhD	Department of Medical Education	Medical Nutrition Therapy Immersion to Enhance Learning and Use of Nutrition Counseling	International Association of Medical Science Educators
Robert Cohen, MD	Department of Internal Medicine, Division of Endocrinology, Diabetes and Metabolism	Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness Study (GRADE)	George Washington University
Elisheva Ruth Coleman, MD	Department of Neurology and Rehabilitation Medicine	Genetic Variation, Stress and Functional Outcomes After Stroke Rehabilitation	University of California, Irvine
Laura Conforti, PhD	Department of Internal Medicine, Division of Nephrology and Hypertension	Humanized Mouse Model of Lupus Nephritis	Dialysis Clinic, Inc.
Laura Conforti, PhD	Department of Internal Medicine, Division of Nephrology and Hypertension	Targeted Nanoparticle-based Therapy in SLE	Dialysis Clinic, Inc.
Alexandru Costea, MD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	Efficacy of DE-MRI-Guided Ablation vs. Conventional Catheter Ablation of Atrial Fibrillation (DECAAF II)	University of Utah
John Thomas Cunningham, PhD	Department of Cancer Biology	Leveraging Built-In Enzyme Redundancy to Exploit Cancer Cells' Achilles' Heel	The V Foundation
Melanie T. Cushion, PhD	Department of Internal Medicine, Division of Infectious Diseases	International Workshop on Opportunistic Protists (IWOP-14)	National Institute of Allergy and Infectious Diseases
Melanie T. Cushion, PhD	Department of Internal Medicine, Division of Infectious Diseases	Pre-clinical Models of Infectious Diseases: Task Area A: Small Animal Models of Infectious Diseases	National Institute of Allergy and Infectious Diseases

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Steve Davidson, PhD	Department of Anesthesiology	Limbic Plasticity in Chronic Pain: A Role for Group II Metabotropic Glutamate Receptors	Brain & Behavior Research Foundation
Steve Davidson, PhD	Department of Anesthesiology	Thalamo-Limbic Circuits in Pain	National Institute of Neurological Disorders and Stroke
George Deepe, MD	Department of Internal Medicine, Division of Infectious Diseases	HIF Regulation of Histoplasma Pathogenesis	National Institute of Allergy and Infectious Diseases
George Deepe, MD	Department of Internal Medicine, Division of Infectious Diseases	GM-CSF-Induced Metal Sequestration and Histoplasma	National Institute of Allergy and Infectious Diseases
Emily DeFranco, DO	Department of Obstetrics and Gynecology	Maternal Tdap and IIV Study Logical Follow-on Project	Cincinnati Children's Hospital Medical Center
Ranjan Deka, PhD	Department of Environmental Health	Next Generation Association Studies of Adiposity in Samoans Enhanced by a Samoan-Specific Whole Genome Sequence Reference Panel	University of Pittsburgh
Melissa Delbello, MD	Department of Psychiatry and Behavioral Neuroscience	Neurobehavioral Response During Antidepressant-related Dysfunctional Arousal in High-Risk Youth	Stanford University
Deeptankar DeMazumder, MD, PhD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	Critical Health Assessment and Outcomes Study/Score during sleep (CHAOS-sleep)	American Heart Association - National Chapter
Michae Demetria, Emily Igel, Mark Castleberry	Department of Molecular Genetics, Biochemistry and Microbiology and Department of Pathology and Laboratory Medicine	Understanding Cardiovascular Disease Mechanisms	Cincinnati Children's Hospital Medical Center
Zhongyun Dong, MD, PhD	Department of Internal Medicine, Division of Hematology Oncology	Preclinical Safety and Efficacy Assessment of a Novel PCNA Inhibitor for Prostate Cancer Therapy	National Cancer Institute
Andrew Duker, MD	Department of Neurology and Rehabilitation Medicine	A Randomized, Double-Blind, Placebo-Controlled, Phase 2a, Parallel Group, Two-Cohort Study to Define the Safety, Tolerability, Clinical and Exploratory Biological Activity of the Chronic Administrati	Northwestern University
Robert Ellis, MD	Department of Family and Community Medicine	Choose Ohio First Scholarship Program	Ohio Department of Higher Education
Robert Ellis, MD	Office of Research	Choose Ohio First Scholarship Program	Ohio Department of Higher Education
Kristen Engevik	Department of Pharmacology and Systems Physiology	Elucidating the Mechanism Behind TFF2-mediated Gastric Restitution	National Institute of Diabetes and Digestive and Kidney Disease

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Kobina Quansah Essandoh	Department of Pharmacology and Systems Physiology	Role of Tsg101 in Endosomal Translocation of Glut-4 in Ischemic Hearts	American Heart Association - National Chapter
Mercedes Falciiglia, MD	Department of Internal Medicine, Division of Endocrinology, Diabetes & Metabolism	The Stroke Hyperglycemia Insulin Network Effect (SHINE) Trial	University of Virginia
Guo-Chang Fan, PhD	Department of Pharmacology and Systems Physiology	Tsg101 and Endosomes in Cardiac Surgery-induced Injury	National Institute of General Medical Sciences
Gregory Fermann, MD	Department of Emergency Medicine	Strategies to Innovate EmeRgENcy Care Clinical Trials Network (SIREN)	National Institute of Neurological Disorders and Stroke
Carl Fichtenbaum, MD	Department of Internal Medicine, Division of Infectious Diseases	HPTN 083 is a Phase 2b/3 Safety and Efficacy Study of Injectable Cabotegravir Compared to Daily Oral Tenofovir Disoproxil Fumarate/Emtricitabine (TDF/FTC), for Pre-Exposure Prophylaxis	Case Western Reserve University
Carl Fichtenbaum, MD	Department of Internal Medicine, Division of Infectious Diseases	Resetting Immune Homeostasis: A Non-invasive Approach Towards HIV Eradication	Case Western Reserve University
Carl Fichtenbaum, MD	Department of Internal Medicine, Division of Infectious Diseases	ACTG Core Funds	Case Western Reserve University
Carl Fichtenbaum, MD	Department of Internal Medicine, Division of Infectious Diseases	Pitavastatin to REduce Physical Function Impairment and Frailty in HIV (PREPARE)	Brigham and Women's Hospital, Inc.
Carl Fichtenbaum, MD	Department of Internal Medicine, Division of Infectious Diseases	Women's Ancillary Study - Cardiovascular Disease Risk in HIV-infected Women: Sex-Specific Mechanisms of Risk and Risk Reduction among REPRIEVE Trial Participants	Massachusetts General Hospital
Andrew Filak Jr., MD	Dean's Office	Area Health Education Centers Point of Service Maintenance and Enhancement	University of Toledo Health Science Campus
Matthew Flaherty, MD	Department of Neurology and Rehabilitation Medicine	Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2)	Mayo Clinic (Jacksonville)
Brandon Foreman, MD	Department of Neurology and Rehabilitation Medicine	The Impact of Intracranial Pressure on Cortical Functioning and Cognitive Outcome after Traumatic Brain Injury	National Institute of Neurological Disorders and Stroke
Andrew Freeman, MD	Department of Environmental Health	Worker Health and Safety Training Cooperative Agreement DOE	International Chemical Workers Union Council
Jason Gardner, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Erythropoietin Resistant Anemia Induced by Thermal Injury	Shriners Hospitals for Children - Cincinnati

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Mary Beth Genter, PhD	Department of Environmental Health	Neuroprotective Effects of Carnosine in the Olfactory System in the Thy1-aSyn Mouse Model of Parkinsonism	Department of the Army Medical Research Acquisition Activity
Tracy Glauser, MD	Department of Neurology and Rehabilitation Medicine	Cincinnati Neuroscience Clinical Trials Research Center (CinciNEXT)	National Institute of Neurological Disorders and Stroke
Erich Goebel	Department of Molecular Genetics, Biochemistry and Microbiology	Characterization of the Growth and Differentiation Factor 11 Ternary Receptor Assembly	American Heart Association - National Chapter
Michael Goodman, MD	Department of Surgery, Section of Trauma and Critical Care	An Open-Label Pharmacokinetic Study of Minocycline for Injection Following a Single Infusion in Critically-Ill Adults (ACUMIN)	Duke Clinical Research Institute
Michael Goodman, MD	Department of Surgery	Role of Acid Sphingomyelinase in the Modulation of Coagulation After Traumatic Brain Injury	National Institute of General Medical Sciences
Brian Grawe, MD	Department of Orthopaedic Surgery	Surgical Timing and Rehabilitation (STaR) for Multiple Ligament Knee Injuries (MLKIs): A Multicenter Integrated Clinical Trial	University of Pittsburgh
Kenneth Greis, PhD	Department of Cancer Biology	Collaborative Research: Ammonia Oxidizers and Their Heterotrophic Friends	National Science Foundation
Erich Gulbins, MD, PhD	Department of Surgery	Role of Acid Sphingomyelinase in the Modulation of Coagulation After Traumatic Brain Injury	National Institute of General Medical Sciences
Erich Gulbins, MD, PhD	Department of Surgery	Membrane Raft Platforms in Inflammasome Activation and Endothelial Dysfunction	Virginia Commonwealth University
Nishant Gupta, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Targeting Prostaglandin Biosynthesis and Action in Lymphangioliomyomatosis	National Heart, Lung and Blood Institute
Nishant Gupta, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Home Spirometry to Evaluate Disease Progression and Treatment Response in Patients with LAM	Lymphangioliomyomatosis (LAM) Foundation
Lynne Tracey Haber, PhD	Department of Environmental Health	Independent Health Review of City of Columbia Drinking Water	Columbia/Boone County Public Health and Human Services
Lynne Tracey Haber, PhD	Department of Environmental Health	Standardization of Methods to Characterize the Release of Manufactured Nanomaterials	NeutralScience L3C
Brett Harnett, MS	Department of Biomedical Informatics	Advanced Development and Dissemination of EMERSE for Cancer Phenotyping from Medical Records	University of Michigan

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Erin Haynes, DrPH	Department of Environmental Health	Development of a Lab on a Chip for Point of Care Biomonitoring of Blood Metals	University of Illinois at Chicago
Caroline Hensley	Department of Internal Medicine, Division of General Internal Medicine	Student-Run Free Clinic Cincinnati	Cincinnati Children's Hospital Medical Center
Shuk Mei Ho, PhD	Department of Environmental Health	Targeting Prostaglandin Biosynthesis and Action in Lymphangioleiomyomatosis	National Heart, Lung and Blood Institute
Shuk Mei Ho, PhD	Department of Environmental Health	Center for Environmental Genetics	National Institute of Environmental Health Sciences
Christy Holland, PhD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	Echogenic Targeted Liposomes: Transfection/Drug Delivery	University of Texas Health Science Center at Houston
Michael Holliday, MD	Department of Family and Community Medicine	University of Cincinnati Cardiovascular Disease Collaborative	Case Western Reserve University
Christian Hong, PhD	Department of Pharmacology and Systems Physiology	(PQ6) Roles of Circadian Rhythms in Tumor Development	National Cancer Institute
Moises Arturo Huaman, MD, MSc	Department of Internal Medicine, Division of Infectious Diseases	Huaman ACTG Minority Supplement	Brigham and Women's Hospital, Inc.
Kristin Hudock, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	The NET Effect: Human CF Epithelial Responses to NETosis	National Heart, Lung and Blood Institute
Kristin Hudock, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	PETAL Network: VIOLET - Vitamin D to Improve Outcomes by Leveraging Early Treatment	Cleveland Clinic
David Hui, PhD	Department of Pathology and Laboratory Medicine	Smarter Exosomes Derived From Engineered MSCs Promote Neovascularization	National Heart, Lung and Blood Institute
Tianlun Jiang	Department of Internal Medicine, Division of Infectious Diseases	Antifungal Immunity Controlled Bycommensal Intestinal Bacteria, F30	Cincinnati Children's Hospital Medical Center
Jay Johannigman, MD	Department of Surgery, Section of Trauma and Critical Care	Strategies to Innovate EmeRgENcy Care Clinical Trials Network (SIREN)	National Institute of Neurological Disorders and Stroke
Ana Luisa Kadekaro, PhD	Department of Dermatology	Breaking Down the Matrix in the Melanoma Microenvironment: Mechanism and Therapeutic Evaluation	National Cancer Institute
Winston Whei Yang Kao, PhD	Department of Ophthalmology	"On-demand" Long-Term Drug Delivery for Age-Related Macular Degeneration Treatment	Ohio Lions Eye Research Foundation

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Winston Whei Yang Kao, PhD	Department of Ophthalmology	Effect of Extracellular Matrix Components on Umbilical Cord derived Mesenchymal Stem Cells (UMSCs)	Ohio Lions Eye Research Foundation
Winston Whei Yang Kao, PhD	Department of Ophthalmology	Gene and Cell Therapy of Ocular Surface Diseases	Ohio Lions Eye Research Foundation
Winston Whei Yang Kao, PhD	Department of Ophthalmology	Treatment of Dog Dry Eye Diseases with Umbilical Mesenchymal Stromal/Stem Cells	Cincinnati Eye Bank
Susan Kasper, PhD	Department of Environmental Health	Stathmin Phosphorylation as a Target for Blocking Metastasis in Prostate Cancer	Department of the Army Medical Research Acquisition Activity
Tazheh Kavoosi	Department of Neurology and Rehabilitation Medicine	MEG Connectivity to Predict Laser Ablation Outcome in Medically Intractable Pediatric Epilepsy	American Academy of Neurology
H. Joseph Kiesler, MD	Department of Family and Community Medicine	Training an Interprofessional Workforce Prepared to Care for the Medicaid Population through Community-Academic Partnerships	Ohio State University
Brett Kissela, MD	Department of Neurology and Rehabilitation Medicine	VCID and Stroke in a Bi-racial National Cohort	University of Alabama at Birmingham
Steven Kleene, PhD	Department of Pharmacology and Systems Physiology	Pharmacological Activation of TRPP2 to Restore Calcium Levels and Reduce Cystogenesis in ARPKD	University of Alabama at Birmingham
Dawn Kleindorfer, MD	Department of Neurology and Rehabilitation Medicine	Left Atrial abNormality, ThromboEmbolism, and Race: Novel risk factors for stroke (LANTERN)	Joan & Sanford I. Weill Medical College of Cornell University
Rhett Kovall, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	NSF/MCB-BSF: Quantitative Analysis and Modeling of Notch Signaling Using In Vivo Synthetic Biology	Cincinnati Children's Hospital Medical Center
Rhett Kovall, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	Development of Small Molecule Inhibitors of NACK as Novel Cancer Therapeutic Agents Targeting the Notch Pathway	University of Miami
Robert Krikorian, PhD	Department of Psychiatry and Behavioral Neuroscience	Changes in Cognitive Function, Gut Microbiota and Metabolism Following Strawberry Supplementation in At-risk Middle-aged Individuals	California Strawberry Commission
Scott Langevin, PhD	Department of Environmental Health	Exosomal miRNA as Salivary Biomarkers for HPV+ Head and Neck Carcinoma	National Institute of Dental and Craniofacial Research
Alex Lentsch, PhD	Department of Surgery	Shriner's Hospital Consulting Agreements, Calendar Year 2018	Shriners Hospitals for Children - Cincinnati
Alex Lentsch, PhD	Department of Surgery	Host Response to Trauma Research Training Program	National Institute of General Medical Sciences

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Yutian Li	Department of Pharmacology and Systems Physiology	Role of Sectm1a in Diabetes-Induced Cardiac Dysfunction	American Heart Association - National Chapter
Tracie Lin	Department of Internal Medicine, Division of Cardiovascular Health and Disease	Critical Health Assessment and Outcomes Study for predicting acute sleep-disordered breathing (CHAOS SBD)	American Heart Association - National Chapter
Min Liu, PhD	Department of Pathology and Laboratory Medicine	Smarter Exosomes Derived From Engineered MSCs Promote Neovascularization	National Heart, Lung and Blood Institute
Michael Lyons, MD	Department of Emergency Medicine	HIV Testing in Ohio Emergency Departments	Hamilton County Public Health
Michael Lyons, MD	Department of Emergency Medicine	Early Intervention Program	Brightview Foundation
Michael Lyons, MD	Department of Emergency Medicine	HIV Prevention Activities	Hamilton County Public Health
Amy Makley, MD	Department of Surgery, Section of Trauma and Critical Care	Attenuation of the Red Blood Cell Storage Lesion to Allow Extended Use of Previously Cryopreserved pRBC Units in Austere Environments	Air Force Research Laboratory
Amy Makley, MD	Department of Surgery	An Open-Label Pharmacokinetic Study of Minocycline for Injection Following a Single Infusion in Critically-ill Adults (ACUMIN)	Duke Clinical Research Institute
Bryan Maliken	Department of Cancer Biology	Cardiovascular Impact of Gata4 Loss in the c-Kit Lineage	Cincinnati Children's Hospital Medical Center
Samuel Marcucci	Department of Neurology and Rehabilitation Medicine	The Effect of Ocrelizumab on Lymphocytes in Multiple Sclerosis Patients Previously Exposed to Lymphocyte Depleting Agents	Foundation of the Consortium of Multiple Sclerosis Centers
Aaron Marshall, PhD	Department of Medical Education	Medical Nutrition Therapy Immersion to Enhance Learning and Use of Nutrition Counseling	International Association of Medical Science Educators
Susan Elizabeth Martelle, PhD	Department of Psychiatry and Behavioral Neuroscience	The Role of Stress Hormones and Dopamine in a Novel Genetic Rat Model of PTSD	Cohen Veterans Bioscience
Francis McCormack, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	2017 LAM Foundation International Lymphangioleiomyomatosis Research Conference	National Heart, Lung and Blood Institute
Francis McCormack, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Targeting Prostaglandin Biosynthesis and Action in Lymphangioleiomyomatosis	National Heart, Lung and Blood Institute
Francis McCormack, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Pulmonary Epithelial Dynamics and Innate Host Defense	National Heart, Lung and Blood Institute

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Francis McCormack, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Therapeutic Benefit of HSP90 Inhibition in Pulmonary Fibrosis	Cincinnati Children's Hospital Medical Center
Francis McCormack, MD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	WT1 Regulation of Pulmonary Fibrosis	Cincinnati Children's Hospital Medical Center
Jason Curtis McCoy	Department of Molecular Genetics, Biochemistry and Microbiology	Growth Differentiation Factor 8 (GDF8) Antagonism by Growth Associated Serum Protein (GASP)	American Heart Association - National Chapter
Jason McMullan, MD	Department of Emergency Medicine	Strategies to Innovate EmergENcy Care Clinical Trials Network (SIREN)	National Institute of Neurological Disorders and Stroke
Stephen Medlin, DO	Department of Internal Medicine, Division of Hematology Oncology	A Phase I, Multi-Center, Open-Label, Dose Escalation Study of Thrombosomes in Bleeding Thrombocytopenic Patients in Three Cohorts.	Cellphire, Inc.
Mario Medvedovic, PhD	Department of Environmental Health	Building Toxlcogenomics Database for Occupational Health Risk Assessment of Engineered Nanomaterials	National Institute for Occupational Safety and Health
Jaroslav Meller, PhD	Department of Environmental Health	Pharmacogenetics of Oxycodone, Personalized Care and Persistent Surgical Pain	Indiana University
Anil Menon, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	Development of Salisphere-derived Systems for the Study of Cytomegalovirus vGPCR Directed Viral Growth in the Salivary Gland	National Institute of Dental and Craniofacial Research
Ronald Millard, PhD	Department of Pharmacology and Systems Physiology	Smarter Exosomes Derived From Engineered MSCs Promote Neovascularization	National Heart, Lung and Blood Institute
William Miller, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	Development of Salisphere-derived Systems for the Study of Cytomegalovirus vGPCR Directed Viral Growth in the Salivary Gland	National Institute of Dental and Craniofacial Research
William Miller, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	Mechanisms of vGPCR mediated Cytomegalovirus Growth in the Salivary Gland	National Institute of Allergy and Infectious Diseases
La'trice Montgomery, PhD	Department of Psychiatry and Behavioral Neuroscience	Twitter-Based Intervention for Young Adult African American Blunt Smokers	National Institute on Drug Abuse
Douglas Mossman, MD	Department of Psychiatry and Behavioral Neuroscience	ODMHAS Educational Grant to UC Forensic Psychiatry Fellowship	Ohio Department of Mental Health and Addiction Services
Laura Benjamin Ngwenya, MD, PhD	Department of Neurology and Rehabilitation Medicine	Identifying the Genetic Risk Underlying Poor Cognitive Recovery After Traumatic Brain Injury	Local Initiative for Excellence (L.I.F.E.)

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Madeline Rae Niederkorn	Department of Cancer Biology	The TIFAB-USP15 Complex in the Pathogenesis of MDS and AML	National Heart, Lung and Blood Institute
Liran Oren, PhD	Department of Otolaryngology-Head and Neck Surgery	The Application of Vortex Airflow to Continuous Positive Airway Pressure (CPAP) Therapy	Cleveland Clinic
A. Phillip Owens, PhD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	The Role of Protease-activated Receptor 2 in Atherosclerosis	National Heart, Lung and Blood Institute
Joseph Palascak, MD	Department of Internal Medicine, Division of Hematology Oncology	CDC17-18-HTC434	Hemophilia Foundation of Michigan
Susan Pinney, PhD	Department of environmental Health	Endocrine Disruptors and Heart Health	National Institute of Environmental Health Sciences
David Plas, PhD	Department of Cancer Biology	Biguanide Sensitivity of Glioma Stem Cells	Cincinnati Children's Hospital Medical Center
Timothy Pritts, MD, PhD	Department of Surgery	Attenuation of the Red Blood Cell Storage Lesion to Allow Extended Use of Previously Cryopreserved pRBC Units in Austere Environments	Air Force Research Laboratory
Alvaro Puga, PhD	Department of Environmental Health	Molecular Mechanisms of Complex Mixture Toxicity	National Institute of Environmental Health Sciences
Xiaoyang Qi, PhD	Department of Internal Medicine, Division of Hematology Oncology	Biotherapy of Brain Tumors by Radioiodinated SapC-DOPS Nanovesicles	Molecular Targeting Technologies, Inc.
John Quinlan, MD	Department of Neurology and Rehabilitation Medicine	MEG Connectivity to Predict Laser Ablation Outcome in Medically Intractable Pediatric Epilepsy	American Academy of Neurology
Marepalli Rao, PhD	Department of Environmental Health	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Tiina Reponen, PhD	Department of Environmental Health	Role of Measured and Observed Mold in the Development of Children's Asthma	Department of Housing and Urban Development
Carol Rice, PhD	Department of Environmental Health	Hazardous Materials Worker Health and Safety Training	International Chemical Workers Union Council
Carol Rice, PhD	Department of Environmental Health	Multi Union, National Ebola & Infectious Disease Awareness Training and Trainee Development	International Chemical Workers Union Council
Carol Rice, PhD	Department of Environmental Health	Worker Health and Safety Training Cooperative Agreement DOE	International Chemical Workers Union Council
Ross Ristagno, MD	Department of Radiology, Section of Interventional Radiology	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Francisco Romo-Nava, MD, PhD	Department of Psychiatry and Behavioral Neuroscience	Spinal Cord Stimulation for the Treatment of Major Depressive Disorder	Brain & Behavior Research Foundation
Jack Rubinstein, MD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	Endocrine Disruptors and Heart Health	National Institute of Environmental Health Sciences
Shimul Shah, MD	Department of Surgery, Section of Transplantation	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Wenhai Shao, PhD	Department of Internal Medicine, Division of Immunology, Allergy and Rheumatology	Kymera Project	Kymera Therapeutics Inc.
Kenneth Sherman, MD, PhD	Department of Internal Medicine, Division of Digestive Diseases	Interferon-Free Therapy for Chronic Hepatitis C Virus Genotype 1 Infection in Patients with HIV-1 Coinfection Receiving Concurrent Antiretroviral Therapy	Brigham and Women's Hospital, Inc.
Kenneth Sherman, MD, PhD	Department of Internal Medicine, Division of Digestive Diseases	The Cost Effectiveness of Screening for Chronic Hepatitis C Infection in the United States: An Update for 2018	CDC Foundation
Alan George Smulian, MD	Department of Internal Medicine, Division of Infectious Diseases	EVADE-A Phase 2 Proof-of-Concept Study to Evaluate the Efficacy and Safety of MED13902 in Mechanically Ventilated Patients for the Prevention of Nosocomial Pneumonia Caused by Pseudomonas aeruginos	Duke University
Matia Solomon, PhD	Department of Psychiatry and Behavioral Neuroscience	A Mouse Model of Lipedema: Lower Body Subcutaneous Adipose Tissue Specific Estrogen Receptor KO	Colorado State University
Dorothy Supp, PhD	Department of Surgery, Section of Plastic, Reconstructive and Hand Surgery/Burn Surgery	Reprogramming the Dermal Microenvironment to Induce Hair Follicle Neogenesis in Engineered Skin	National Institute of Arthritis, Musculoskeletal and Skin Disease
Charuhas Thakar, MD	Department of Internal Medicine, Division of Nephrology and Hypertension	Frequency, Risk Factors, and Clinical Consequences of Hyperalemia in Solid Organ Transplant Recipients	Relypsa, Inc
Michael Thomas, MD	Department of Obstetrics and Gynecology	A National Training Program in Reproductive Medicine	Pennsylvania State University
Richard Thompson, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	HSV Latency and Reactivation and the Novel Neuronal Regulation of VP16 in Vivo	Cincinnati Children's Hospital Medical Center
Richard Thompson, PhD	Department of Molecular Genetics, Biochemistry and Microbiology	Forward Genetic Prediction and Testing of Virulence Loci in Herpes Simplex Virus 1	Pennsylvania State University

## OTHER FACULTY GRANTS FY2018 (continued)

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Barbara Tobias, MD	Department of Family and Community Medicine	Training an Interprofessional Workforce Prepared to Care for the Medicaid Population through Community-Academic Partnerships	Ohio State University
Barbara Tobias, MD	Department of Family and Community Medicine	University of Cincinnati Cardiovascular Disease Collaborative	Case Western Reserve University
Michael Tranter, PhD	Department of Internal Medicine, Division of Cardiovascular Health and Disease	The Role of Protease-activated Receptor 2 in Atherosclerosis	National Heart, Lung and Blood Institute
Jared Travers	Department of Internal Medicine, Division of Infectious Diseases	Role of Nuclear IL-33 in Mucosal Inflammation F30	Cincinnati Children's Hospital Medical Center
Yvonne Ulrich-Lai, PhD	Department of Psychiatry and Behavioral Neuroscience	Behavioral Assay Development to Assess Preference for Exercise Relative to Palatable Food	Augusta University
Kyle Walsh, MD	Department of Emergency Medicine	SBIR Phase II: Novel Device for Monitoring Brain Hemorrhage Using Radio Waves	Sense Diagnostics, LLC
Hong-Sheng Wang, PhD	Department of Pharmacology and Systems Physiology	Endocrine Disruptors and Heart Health	National Institute of Environmental Health Sciences
Jiang Wang, MD, PhD	Department of Pathology and Laboratory Medicine	Monitoring and Control of Human Liver Cancer Ablation Using Real-time, 3D Echo Decorrelation Imaging	National Cancer Institute
Yi-Gang Wang, MD, PhD	Department of Pathology and Laboratory Medicine	Smarter Exosomes Derived From Engineered MSCs Promote Neo-vascularization	National Heart, Lung and Blood Institute
Collin Wetzel, PhD	Department of Cancer Biology	Purine Metabolism In Renal Cell Carcinoma	American Cancer Society - National Chapter
Theresa Winhusen, PhD	Department of Psychiatry and Behavioral Neuroscience	EMPOWER: Evaluating the Ability to Reduce Morphine Equivalent Dose for Chronic Pain Patients Receiving Opioid-therapy Through a Web-based E-Health Self-management Program: A Randomized Multi-site Clin	National Institute on Drug Abuse
Daniel Woo, MD	Department of Neurology and Rehabilitation Medicine	ICH Recovery Grant	National Institute of Neurological Disorders and Stroke
Daniel Woo, MD	Department of Neurology and Rehabilitation Medicine	Cincinnati Neuroscience Clinical Trials Research Center (CinciNEXT)	National Institute of Neurological Disorders and Stroke
Changchun Xie, PhD	Department of Environmental Health	Endocrine Disruptors and Heart Health	National Institute of Environmental Health Sciences

OTHER FACULTY GRANTS FY2018 *(continued)*

INVESTIGATOR	DEPARTMENT	GRANT TITLE	SPONSOR
Meifeng Xu, MD, PhD	Department of Pathology and Laboratory Medicine	Smarter Exosomes Derived From Engineered MSCs Promote Neovascularization	National Heart, Lung and Blood Institute
Jane Yu, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Targeting Prostaglandin Biosynthesis and Action in Lymphangioliomyomatosis	Lymphangioliomyomatosis (LAM) Foundation
Jane Yu, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Targeting Prostaglandin Biosynthesis and Action in Lymphangioliomyomatosis	National Heart, Lung and Blood Institute
Jane Yu, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	Pulmonary Epithelial Dynamics and Innate Host Defense	National Heart, Lung and Blood Institute
Jane Yu, PhD	Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine	The Impact of Estrogen-promoted Extracellular Matrix-degrading Programs on LAM Progression	University of Pennsylvania
Aram Zabeti, MD	Department of Neurology and Rehabilitation Medicine	The Effect of Ocrelizumab on Lymphocytes in Multiple Sclerosis Patients Previously Exposed to Lymphocyte Depleting Agents	Foundation of the Consortium of Multiple Sclerosis Centers
Raquel Zemtsov, MD, MPH	Department of Otolaryngology-Head and Neck Surgery	AHNS Prevention & Early Detection Committee Community Service Award	American Head and Neck Society
Tongli Zhang, PhD	Department of Pharmacology and Systems Physiology	(PQ6) Roles of Circadian Rhythms in Tumor Development	National Cancer Institute

## Faculty

Tenure/Tenure Track	357
Clinical Track	1,217
Research Track	186
Field Service Track	48
Educator Track	34
Volunteer/Adjunct/Visiting	442

## All Funds Operating Revenue\* FY2018 (IN MILLIONS)

Clinical Practice	\$620.2
Federal/Non-Federal Research	\$272.9
Hospitals	\$264.8
State Appropriations	\$42.2
Gift and Endowment Income	\$24.8
Other Income	\$191.1
Tuition	\$35.2
<b>TOTAL OPERATING REVENUE</b>	<b>\$1,451.2</b>

\*From LCME 1-A

## College of Medicine Facilities

Buildings	16
Research Space (net square feet)	420,951
Total Space (gross square feet)	2.31 million

## Development

Total Dollars Raised (fund year 2018)	\$38,563,971
College of Medicine Endowments (market value as of 6/30/2018)	\$486,072,973

## College of Medicine Leadership

**Andrew T. Filak Jr., MD**

Interim Senior Vice President for Health Affairs and Dean

**Melanie T. Cushion, PhD**

Senior Associate Dean for Research

**Philip M. Diller, MD, PhD**

Senior Associate Dean for Educational Affairs

**Brett M. Kissela, MD**

Senior Associate Dean for Clinical Research

**Alex B. Lentsch, PhD**

Senior Associate Dean for Faculty Affairs and Development

**Lori A. Mackey**

Senior Associate Dean for Operations and Finance

Chief Financial Officer

**Myles L. Pensak, MD**

Senior Associate Dean for Clinical Programs





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## Notice of Nondiscrimination

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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; grunowl@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

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