IUPUI INDIANA UNIVERSITY–PURDUE UNIVERSITY INDIANAPOLIS

Research Enterprise

April 24, 2015

The Office of the Vice Chancellor for Research (OVCR) publishes the RESEARCH ENTERPRISE to keep the academic community and the community at large informed about research activities, opportunities and development on the IUPUI campus.

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If you have a news item or recent noteworthy research-related achievement that you would like to share, please see the Research Enterprise Submission Guidelines.

Please be aware that not all news items will be deemed appropriate or timely for publication, but each item will be carefully considered.

INSIDE THIS ISSUE:

FEATURE STORY

IUPUI mathematician receives $1.4 million to study link between respiration and high blood pressure in sleep apnea


Yaroslav Molkov,Ph.D.

Yaroslav Molkov, assistant professor of mathematics in the School of Science at Indiana University-Purdue University Indianapolis, has received a $1.4 million grant from the National Institutes of Health to study the neuroscience underlying obstructive sleep apnea -- specifically targeting how respiration and high blood pressure are linked in the brain.

Sleep apnea affects an estimated 25 million adults in the United States and is associated with increased risk of hypertension, stroke, health attack and heart failure.

Obstructive sleep apnea is characterized by recurrent upper airway collapses resulting in brief interruptions of breathing during sleep. Episodes occur repeatedly. Untreated obstructive sleep apnea has cumulative effects on the cardiovascular system, leading to hypertension that may be drug resistant. It is estimated that half of all individuals with obstructive sleep apnea are hypertensive.

The five-year award (R01AT008632-01) from NIH's National Center for Complementary and Integrative Health will enable Molkov to develop a computational model to simulate the electrical signals generated by neurons that travel from the brain to the muscles controlling breathing and blood vessels.

Molkov and neurophysiologists Ana Abdala and Julian Paton of the University of Bristol in the United Kingdom and Daniel Zoccal of Sao Paulo State University in

Brazil are collaborating on this interdisciplinary project that will investigate the mechanisms that link breathing and control of blood pressure in the brain in both health and disease.

Molkov's work will inform the neurophysiology experiments, and he will translate findings of this work into what he describes as the first computer model with the potential to generate effective means of controlling hypertension by exploiting its association with respiratory mechanisms.

"Understanding the complex neuroscience of how breathing and control of blood pressure are linked in the brain will be instrumental in developing alternative approaches to treatment of hypertension," said Molkov, who joined the School of Science at IUPUI in 2011. "Conventional therapeutic management is poor. New answers are needed."

Molkov is an applied mathematician with extensive training in computational neuroscience.

For the past several years, he has studied neurophysiology of respiration and worked with respiratory system physiological data, computer modeling of neurons, neural networks, and large-scale neural systems, and then analyzed these models. He is the first author of "A Closed-Loop Model of the Respiratory System: Focus on Hypercapnia and Active Expiration," published in *PLOS One* on Oct. 10, 2014 and of "Physiological and Pathophysiological Interactions Between the Respiratory Central Pattern Generator and the Sympathetic Nervous System," published in *Progress in Brain Research* in 2014.

IUPUI students at the undergraduate, graduate and post-doctoral levels will work with Molkov on the study.

ANNOUNCEMENTS

Successful 7th Annual Research Day Recap

Hosted by the Office of the Vice Chancellor for Research and the Center for Research and Learning, Research Day is an annual celebration of campus research and creative activity held at the Campus Center. And by all accounts, this year's theme, "Research and Creative Activity . . . Fulfilling the Promise," did just that. It fulfilled the promises of showcasing some of the extraordinary work taking place on campus as well as offering an introduction to the world of research to over 800 attendees, including community members and local high school students.

Undergraduate student research, Darryl Watkins, explains his research to high school students

Vice Chancellor for Research Kody Varahramyan opened the all-day event with welcoming remarks that highlighted the depth and breadth of campus research projects. He was followed by Stephan Viehweg, interim director of IUPUI Center for Translating Research Into Practice, who introduced this year's Research Frontiers Trailblazer Award winners, a program that recognizes outstanding IUPUI researchers who show great promise in becoming renowned for their accomplishments. The three honorees for 2015 were Drs. Molly Duman Scheel (Associate Professor of Medical and Molecular Genetics), Yiqing Song (Associate Professor of Epidemiology), and Jian Xie (Associate Professor of Mechanical Engineering). The trio spoke on their work in mosquito biology and potential insecticides (Scheel), nutritional factors in type 2 diabetes and cardiovascular disease (Song), and nanomaterials for fuel cells and

energy storage (Xie).

Dr. Sally Rockey, Research Day Keynote Speaker

IUPUI was honored to present Dr. Sally Rockey, Deputy Director of Extramural Research at the National Institutes of Health (NIH) as the keynote speaker. Her presentation touched upon a subject near and dear to many campus researchers and administrators: funding. She explained some of the workings and future directions for the NIH while offering insights on strategies for submitting competitive proposals. Her remarks were enthusiastically received, an indication not only of the NIH's importance to IUPUI, but of the audience's appreciation of her engaging talking style.


Troy Riggs, Indianapolis Director of Public Safety

2015 also saw the return of "JagTalks"… short and lively presentations by faculty members about their research interests. Kicking off the JagTalks was a guest from city government, Troy Riggs, Director of Public Safety. His "Homicide and Shooting Comparisons: Being More Sophisticated in the Way We Understand Data" explored the ways to better understand and interpret data on crime trends in Indianapolis neighborhoods. Eric Dannenmaier, Professor of Law and Director of the Environmental and Natural Resources Law Program, spoke to the complexity of protecting waterways in a democracy in "Seeing Down River." Meredith Setser, Assistant Professor of Printmaking, talked about felt, the oldest textile known to humankind and how it relates to today's artists and industries in "Terra Felted: The Art of Fabriculture." Rounding out the Jag Talks was Dr. David Craig, Associate Professor of Religious Studies, who offered his thoughts on healthcare reform ethics in "Making Healthcare a Social Good: Obamacare and HIP 2.0." Videos of all four JagTalks presentations can be found on the IUPUI You Tube channel.

The centerpiece of the day were the two poster sessions. Close to 300 posters were presented by a wide range of faculty, staff, and students. The sessions serve as opportunities for people on campus as well as those from greater Indianapolis to learn about the innovation and creativity pursued at IUPUI.

More than 120 high school students enjoyed their own mini-poster session along with pizza! This year also saw a group of middle schoolers in attendance, brought by their STEM teacher who had been inspired by her 2014 Research Day experience. In addition to the posters, Research Day also offers campus faculty a series of roundtable discussions about the six main topics associated with the IUPUI Initiative on Urban Health and Wellbeing: Quality of Life, Education, Public Health, Public Safety, Access to Healthcare, and Environmental Health. No empty seats for those topics!

By all accounts, Research Day 2015 was the best yet. Especially in the poster sessions, the high-energy atmosphere illustrated the event's value as researchers, staff, and students networked and discovered new collaborations or directions relevant to their goals. If you haven't been to one yet, make sure to attend next year. It's a great way for

Dr Gerardo Maupome, IU School of Medicine researcher and investigator in the Center for Urban Health, leads a roundtable discussion.

anyone to learn about what's going on in research and why IUPUI's national profile is growing. As planning begins for the 8th annual IUPUI Research Day in 2016, participants and the IUPUI community are encouraged to send suggestions to OVCR@iupui.edu.

IUPUI announces 2015 Research Frontiers Trailblazer Award winners at 7th Annual Research Day

Left to right: Dr. Jian Xie, Dr. Molly Duman Scheel, Dr. Yiqing Song, and Dr. Kody Varahramyan (IUPUI Vice Chancellor for Research)

Established in 2010, the Research Frontiers Trailblazer Award recognizes outstanding IUPUI researchers who are showing great promise in becoming nationally and internationally known for their accomplishments in advancing the frontiers of knowledge. Specifically, the award is for outstanding accomplishments in research and creative activity by an associate professor within the first three years of promotion or appointment in the given rank.

On April 17, the three winners of the 2014-15 Research Frontiers Trailblazer Awards received honors at IUPUI Research Day for their research on mosquito developmental genetics -- namely, Dr. Molly Duman Scheel, associate professor of medical and molecular genetics*;* the roles of nutritional factors on type 2 diabetes and cardiovascular disease – namely, Dr. Yiquing Song, associate professor of epidemiology; and on the development and use of nanostructured materials – namely, Dr. Jian Xie, associate professor of mechanical engineering. Each winner received a plaque and a $1000 cash prize.

Dr. Scheel is at the forefront of innovative research on mosquito developmental genetics to understand little-known facets of mosquito biology and to create a novel gene targeting approach to combat this human disease vector and its resistance to insecticides. Her research has provided her field with an unprecedented understanding of the genetic controls of *Aedes* mosquito development. To gain these understandings, Dr. Scheel's lab developed, for the first time, methods suited to the particulars of the *Aedes* mosquito. The resulting protocol papers weigh heavily as the primary research papers in advancing disease vector biology.

Dr. Scheel is the epitome of cross-disciplinary research: she recognized that the only way to develop truly novel means of interrupting mosquito-transmitted disease is to unite the disparate scientific fields of entomology, medical sciences, and genetics and molecular biology. Her cross-disciplinary research has the potential not only to advance these fields individually, but also to seamlessly integrate key research thrusts among these fields to develop novel insecticide intervention strategies.

Dr. Song's research centers on the roles of nutritional factors, specifically magnesium and vitamin D, as well as biomarkers and genetic determinants in the development of type 2 diabetes and cardiovascular disease. He currently holds two awards from

the National Institutes of Health: the first studies biochemical biomarkers of vitamin D/parathyroid hormone endocrine system and their potential contributions to racial/ethnic disparities in cardiovascular disease risk, and the second is testing whether vitamin D and omega-3 fatty acid supplementation will reduce the risk of type 2 diabetes to clarify potential health benefits and risks of vitamin D and omega-3 fatty acid supplementation on type 2 diabetes. Both research activities have the potential to direct future public health efforts by designing more effective interventions to eliminate racial disparities of cardiovascular disease and providing direct evidence for clinical guidelines in diabetes prevention.

His research accomplishments include consistent funding from the National Institutes of Health and over 100 publications in high-profile journals like the *Journal of the American Medical Association*. Dr. Song is also a key member of the Magnesium Dietary Reference Intakes Nomination Group, where his research findings helped in the selection of magnesium as a top priority nutrient in the U.S. and Canada. He has demonstrated a strong commitment to IU research activities and public health in the Indianapolis community through service on many committees in his School and through collaborations with IU faculty, faculty from other institutions, and local organizations.

Dr. Song's integration of nutritional epidemiology with genetic and biochemical markers of cardiometabolic disease, and his engagement with the broader scientific and medical community, have created a unique research program that will undoubtedly continue to advance the forefront of research on disease prevention and risk prediction.

Dr. Xie's research exemplifies the ability to tread across university, government, and industry boundaries to create cross-cutting opportunities for transformative research. His research focuses on the development and use of nanostructured materials in four major areas: hydrogen adsorption enhancement, catalyst dispersion for fuel cell construction, battery failure detection, and graphene composites. All of these high-impact areas have applications in transportation systems and smart grids to reduce societal dependence on fossil fuels. The critical fundamental knowledge discovered through Dr. Xie's research on these materials was the direct result of his pioneering research using synchrotron probes, which has great potential to provide unparalleled insights into key materials and to guide the design of advanced materials for next-generation, high-energy density battery materials.

Dr. Xie's research success is exemplified through many highly-cited articles in quality journals, his patent applications, and a broad portfolio of funding success. Not only is Dr. Xie a prolific researcher in a fast-paced field, he is also extremely active in service to IUPUI. Since 2007, he has mentored six graduate students, five postdocs, and 17 undergraduate students. He also actively participated in the development of the new Energy Engineering undergraduate degree program and the creation of the Renewable Energy track in the MS degree program. Additionally, Dr. Xie developed a relationship with the School of Materials Engineering at Purdue University to co-advise graduate students in this field and is currently exploring the potential for a new PhD degree in Materials Engineering available to IUPUI graduate students.

Dr. Xie is a pioneering scientist in multiple fields related to energy conversion and storage. The combination of his vision and his broad collaborative base has already brought him many internationally recognized successes and poise his research for many more trailblazing accomplishments in the near future.

CENTER SPOTLIGHT

Genetic markers may help determine who benefits from aspirin and/or NSAIDs in lowering colorectal cancer risk

An Indiana University cancer researcher and her


Hongmei Nan, M.D., Ph.D.

colleagues have identified genetic markers that may help determine who benefits from regular use of aspirin and other nonsteroidal anti-inflammatory drugs for lowering one's risk of developing colorectal cancer.

Previous studies have shown that regular use of aspirin and NSAIDs lower one's risk of colorectal cancer, but their use is not recommended as a way to prevent the disease because of uncertainty about the risks and benefits. Thus, the researchers set out to examine the interrelationship between genetic markers and the use of aspirin and NSAIDs to learn who actually benefits from their use. They did so by conducting a genome-wide analysis of gene by environment interactions.

Hongmei Nan, M.D., Ph.D., research associate professor in the Department of Epidemiology at the Richard M. Fairbanks School of Public Health at IUPUI, and a researcher at the Indiana University Melvin and Bren Simon Cancer Center, along with her colleagues, found that colorectal cancer risk differed according to genetic variation at two single nucleotide polymorphisms -- more commonly known as SNPs -- at chromosomes 12 and 15. Interestingly, for the SNP at chromosome 12, they found that aspirin and/or NSAID use was associated with a lower risk of colorectal cancer among individuals with a specific genotype, while a higher risk was found among those with other genotypes.

Their study was published March 17 in the *Journal of the American Medical Association*.

"These novel findings have substantial clinical significance," Dr. Nan, the lead author, said. "Our findings, if validated in additional populations, may facilitate targeted colorectal cancer prevention strategies and contribute to precision medicine."

This study is the first and largest genome-wide analysis of gene by environment interactions between SNPs and regular use of aspirin or NSAIDs in relation to colorectal cancer risk. In this case-control study using the Colon Cancer Family Registry and the Genetics and Epidemiology of Colorectal Cancer Consortium, the authors included 8,634 colorectal cancer cases and 8,553 non-cancerous controls.

Colorectal cancer is the second leading cause of cancer death in the United States, according to the National Cancer Institute. In 2014, it was estimated that there would be 136,830 new cases of colorectal cancer and an estimated 50,310 people would die from the disease.

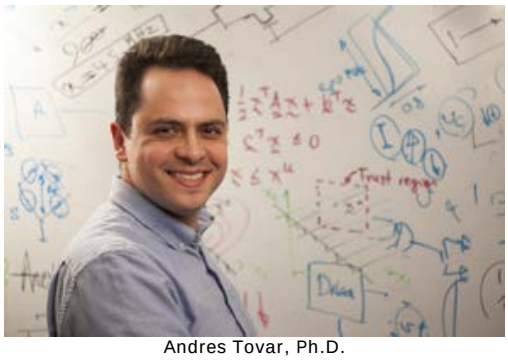
Collaborators included Ulrike Peters, Ph.D., M.P.H., and Li Hsu, Ph.D., both of the Fred Hutchinson Cancer Research Center; and Andrew Chan, M.D., M.P.H., of the Massachusetts General Hospital.

This study was supported, in part, by the National Institutes of Health under grant numbers CA137088, CA059045, CA122839, CA097735, CA074783, CA074794, CA48998, CA055075, CA167552, CA137178, CA151993, CA127003, DK098311, CA074783, CA076366, and CA154337.

FACULTY SPOTLIGHT

IUPUI mechanical engineering faculty member, students win

ultra-light vehicle design challenge


Andres Tovar, Ph.D.

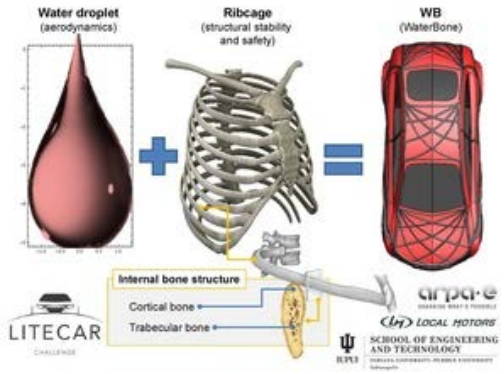
A School of Engineering and Technology faculty member and his graduate students won the $60,000 grand prize in a competition to design a safe ultra-light vehicle.

The winning design, submitted by Andres Tovar, an assistant mechanical engineering professor, and the students, was selected from among more than 250 conceptual designs submitted in the LITECAR Challenge: Lightweighting Technologies Enabling Comprehensive Automotive Redesign. Their design was selected by a panel of experts in materials, crashworthiness, structures, manufacturing, and safety.

The competition, sponsored by Local Motors in partnership with the Advanced Research Projects Agency-Energy, was described as “setting up the challenge and letting the imagination begin” to develop innovative ideas by using novel material technologies, structural designs, energy-absorbing materials, and unique methods of manufacturing to reduce vehicle curb weight while maintaining current U.S. automotive safety standards.

Competition officials said the winning grand prize submission delivered “pretty much the entire package we were looking for,” by effectively creating an exoskeleton over an aluminum frame to protect vehicle occupants.

The proposed vehicle design, called the Aerodynamic Water Droplet with Strong Lightweight Bone Structure, has the outer shape of a water droplet with an embedded trabecular bone-like structure, or spaceframe. The water droplet outer shape provides a low drag coefficient, while the spaceframe layout is designed to provide the mechanical strength and energy-absorption capabilities required to protect the occupant in the event of a collision.



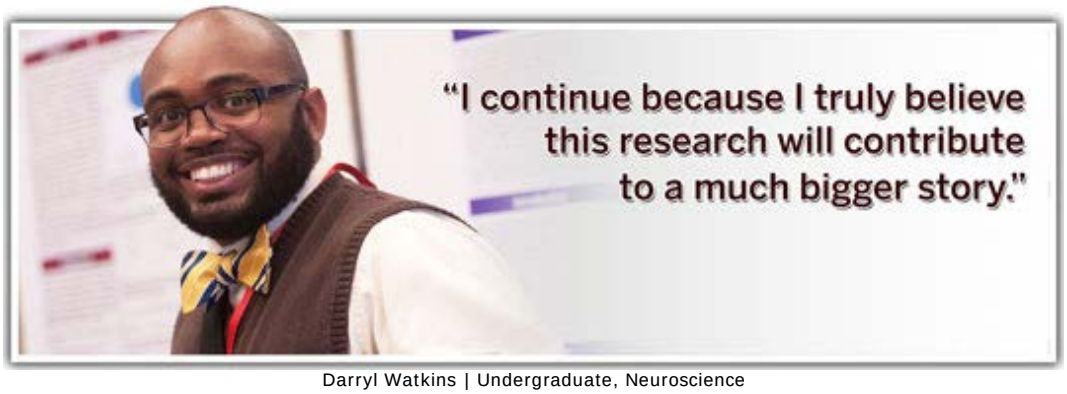
Winning Litecar Challenge design

The material of the outer shape of the vehicle is a polymer composite, which provides desirable characteristics of a structural approach whereby loads are supported through an object's external skin, similar to an egg shell. The spaceframe's material is functionally-graded cellular aluminum alloy. The layout of the proposed spaceframe is designed using a specialized and unique topology optimization algorithm for crashworthiness.

“LITECAR has been critically important to Local Motors because it has stretched the boundaries of the world’s largest open-hardware innovation community to include a focus on the subject of weight reduction,” said John Rogers Jr., co-founder and CEO of Local Motors.

STUDENT SPOTLIGHT

Neuroscience student inspires IUPUI with research



Darryl Watkins | Undergraduate, Neuroscience

For Darryl Watkins, a senior neuroscience major, being a non-traditional student does not mean missing out on any part of the IUPUI experience. Growing up in a single-parent home, "education was never really a priority for most of my family," Watkins says.

Heavily involved in research, Watkins has excelled at IUPUI and was recently featured in the #InspireIUPUI campaign.

As a recipient of the Diversity Scholars Research Program (DSRP) scholarship and Undergraduate Research Opportunity Program (UROP) grant, Darryl participates in research with Feng C. Zhou, Ph.D., in the Department of Anatomy and Cell Biology at Indiana University School of Medicine. This opportunity has allowed Watkins the chance to create and run his own research project studying fetal alcohol syndrome in mice, under the guidance of Zhou.

"From conception, to planning, to the pitfalls, analyzing the data, and now writing the manuscript, I have been the only person on this project," he said. "I believe it is this experience that has driven me to pursue a career in research. I continue because I truly believe this research will contribute to a much bigger story. Although this contribution may be small, it is nevertheless important."

Watkin's abstract for the research in Zhou's lab, "Radiation Alters Epigenetic Programming in Young Adult Mice," was selected for an oral presentation at the 2014 Louis Stokes Midwest Center for Excellence (LSMCE) conference, *Roadmap to Action: LSAMP Model for Broadening Participation*. As one of the top three submissions, Darryl received a monetary award to cover his travel expenses to the conference, October 25-26, 2014, in Chicago, IL. In addition, Watkins received Best Oral Presentation at the Indiana University Undergraduate Research Conference 2014 for his research.

Watkins encourages others to pursue their goals even if they seem out of reach at the time: "You can do it. I know this from experience now and all you have to do is believe you can do it."

TRANSLATIONAL RESEARCH IMPACT

Researchers shaping care for older adults

In 1998, the IU School of Medicine launched the IU Center for Aging Research to help the university tackle health care issues faced by an aging population across the state and throughout the nation.

The center was established by director Chris Callahan, the Cornelius and Yvonne Pettinga Professor in Aging Research in the School of

The Center for Aging Research, affiliated with Regenstrief Institute, is based in the Health Information and Translational Sciences building near the downtown canal.

Medicine, whose game plan included consolidating IU's emerging centers of excellence in the field.

"Our original mission was to be a research center for the care of older adults," Callahan said. "We've stayed true to that mission, through partnerships and relationships that helped us help improve care, and better understand the emerging importance of self-care: the role older adults have in their own care."

The relationships include long-standing ties to the Regenstrief Institute, Eskenazi Health (formerly Wishard Health), the medical school, and a growing research climate focused on geriatric care that has taken root in central Indiana.

Research is just one part of that care, according to Callahan. The new knowledge that research teams develop only has an impact when it is coupled with education and clinical care, one reason why the Center for Aging Research is embedded within the larger IU Geriatrics Program directed by Steven Counsell.

"Not long after we started, we made a decision to offer a balanced program in geriatric medicine," Callahan said. That approach has been both logical and valuable, he added, because it is built on "a great deal of collaboration across disciplines, throughout our [IU] campuses, with Regenstrief, with Eskenazi Health and with other organizations in the community."

Callahan is proud of what the IU Center for Aging Research has accomplished in less than two decades. "We have built a national and international reputation for studying the various models of senior health to see which are most effective," he said. "That is one of the biggest benefits of our ties to Eskenazi Health. It is critical to show a working model that other researchers and geriatric experts can see and visit, and Eskenazi fills that role for us. In turn, we help Eskenazi provide better care."

The ties with Eskenazi offer center researchers another advantage, as well, he noted: "a glimpse of the emerging problems" that researchers will want to tackle in the near future. "The information that their medical experts provide to us gives us ideas to study and to test," Callahan said.

He is proud of the center's research teams, but said the School of Medicine is strong in the field of geriatrics because of the three-pronged approach to care.

"You can't provide quality care if you aren't moving forward, and that's based in research," Callahan said. "But education is also vital, because that is the best way to put research into action, through the third component: clinical care. That has been our greatest advantage."

OVCR INTERNAL GRANT DEADLINES

Release Time for Research (RTR): IUPUI maintains a robust research enterprise. To support faculty with adequate time to prepare competitive proposals, the IUPUI Office of the Vice Chancellor for Research has developed the Release Time for Research (RTR) internal funding mechanism. This funding program allows IUPUI faculty a "buyout" of teaching time to prepare high-quality grant/contract proposals

for submission to external funding agencies. It also supports non-tenure track faculty who are full-time senior lecturers or clinical track faculty possessing terminal degrees relevant to their fields, and who have a desire to engage in research or creative activity in an area that directly relates to their teaching or service mission. *The next RTR application deadline is* ***July 1, 2015.*** For grant guidelines and application forms, go to http://research.iupui.edu/funding/.

OTHER INTERNAL GRANT DEADLINES

Indiana Diabetes Research Center Pilot and Feasibility Program applications due May 1

A primary research-related activity of the Indiana Diabetes Research Center Pilot and Feasibility Program is to foster the development of new diabetes-related investigators and provide seed support for innovative, high-risk projects. The pilot and feasibility program would like to fund three meritorious proposals, each requesting up to $25,000.

This funding opportunity is particularly directed to new investigators and established investigators new to diabetes-related research, and applications from investigators from the IU School of Medicine and IUPUI are encouraged. The program will also consider established diabetes investigators pursuing high-impact/high-risk projects or projects that are a significant departure from their usual work. IUSM and IUPUI are ideal for establishing interdisciplinary collaborations and forging new partnerships between basic scientists and clinical researchers, and such collaborations are encouraged.

Work supported by these funds is expected to lead to submissions of major extramural grants (R01/equivalent NIH, major foundation awards, DOD, etc.). New investigators must have no prior R01 funding, and all proposals must be directed towards basic biomedical, clinical, or translational research questions on cellular and molecular metabolism related to diabetes/obesity/metabolic syndrome, clinical and outcomes research in diabetes and obesity, complications of diabetes and obesity, islet function and survival, and/or nutrition and physiology of obesity.

Applicants should submit a letter of intent by 5 p.m. Wednesday, April 1. The deadline for applications is 5 p.m. Friday, May 1. The letters of intent and applications must be received via email at jelmendo@iupui.edu. For more information, visit the Indiana Diabetes Research Center's website or email jelmendo@iupui.edu.

OTHER EVENTS AND WORKSHOPS

Lecture: Dr. Stephen Selka presents "Mapping the Moral in African Diaspora Tourism in Brazil"

Target Audience: General
When: Friday, April 30, 2015 | 12:00pm - 1:30pm
Where: IUPUI Arts and Humanities Institute, University Library Room 4115S

This talk will explore African diaspora tourism in Bahia, Brazil, particularly African American “pilgrimages” to the Afro-Catholic festival of Our Lady of the Good Death (or simply Boa Morte) celebrated every August by women of African descent involved with the Afro-Brazilian religion of Candomblé. Although recognized as part of the official heritage of Bahia, Boa Morte occupies a complicated position on the Afro-Brazilian moral landscape. To evangelical Christians, for example, Boa Morte and Candomblé are diabolical; from this perspective, Afro-Brazilian religion is something to leave behind. By contrast, to the extent that the festival of Boa Morte is

understood as a celebration honoring the ancestors, it is particularly appealing to African Americans seeking to "recover" their ancestral past. Nevertheless, ancestors are understood to be dangerous and morally unpredictable in Candomblé; therefore, Boa Morte is something morally ambiguous for many Candomblé practitioners, contrary to what most African American visitors might expect. Accordingly, this talk focuses on the contested links between heritage, personhood, and morality that are enacted at the festival of Boa Morte.

Stephen Selka is Associate Professor of Religious Studies and American Studies at Indiana University Bloomington. A cultural anthropologist, he researches religion, politics, and cultural heritage tourism in Afro-Brazilian communities in northeastern Brazil, where he has conducted ethnographic fieldwork since 1999. His first book, *Religion and the Politics of Ethnic Identity in Bahia, Brazil* (University Press of Florida, 2007), explores the various ways that Afro-Brazilians in both Christian and African-derived religious communities construct their ethnic identities and struggle against racism.

This public program is part of the Religion and Ethics Roundtables series of the IU Consortium for the Study of Religion, Ethics, and Society. Religion and Ethics Roundtables highlight the work of scholars at IUB, IUPUI, and beyond, with the goal of engaging the IU community and the public in dialogue about important issues at the intersection of religion, ethics, and society.

IUPUI Arts and Humanities Institute (IAHI) Spring 2015 Lineup

For details and to register, visit http://www.iupui.edu/~iahi/?page_id=39.

RECENT EXTERNAL FUNDING AWARDS

The Office of the Vice Chancellor for Research recognizes and congratulates all IUPUI faculty and researchers for recent awards they have received and that help to advance the IUPUI research enterprise. The following table highlights those receiving $100,000 or more in external grants.

Grants and Awards - March 2015

PI	Agency	Project Title	School	Department	Total
Yu, Andy Qigui	NATIONAL INSTITUTE ALLERGY & INFECTIOUS DISEASES	Targeting latently infected Tfh cells to achieving a functional cure of HIV-1	MEDICINE	MICROBIOLOGY & IMMUNOLOGY	$1,930,382
Bell, Richard L	NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM	Preclinical Medications Screening in P and HAD Rats	MEDICINE	PSYCHIATRY	$1,816,475
Molkov, Yaroslav	NATIONAL CENTER FOR COMPLEMENTARY AND INTEGRATIVE HEALTH	Modeling the respiratory-sympathetic coupling in neurogenic hypertension	SCIENCE	MATHEMATICS	$1,354,853
Loehrer, Patrick J.	ELI LILLY AND COMPANY FOUNDATION	AMPATH Oncology Institute	MEDICINE	CANCER CENTER	$1,000,000
Wiehe, Sarah Elizabeth	AGENCY FOR HEALTHCARE RESEARCH AND QUALITY	Identifying Opportunities to Reduce STI/HIV Disparities among Recent Offenders	MEDICINE	PED-HEALTH SERVICES RESEARCH	$995,886
Buyarski, Catherine A	INDIANA COMMISSION FOR HIGHER EDUCATION	Supporting Student Persistence	UNIVERSITY COLLEGE	UNDERGRAD ED	$206,573
Ironside, Pamela M	THE ROBERT WOOD JOHNSON FOUNDATION	Planning the Nursing Education Research Network	NURSING	NURSING	$159,982
Brown, Cynthia Diane	CYSTIC FIBROSIS FOUNDATION	CFF Second Year Fellow	MEDICINE	PULMONARY	$127,500
McKinley, Todd Owen	JOHNS HOPKINS UNIVERSITY	The Major Extremity Trauma Research Consortium - METRC 2	MEDICINE	ORTHOPAEDIC SURGERY	$120,346
Harris, Tara L	INDIANA CRIMINAL JUSTICE INSTITUTE	Pediatric Center of Hope	MEDICINE	PED-CHILD PROTECTION PROGRAM	$106,626

Zhang, Shanxiang	INDIANA UNIVERSITY HEALTH	Identification of miRNAs for a unique subset of diffuse large B-cell lymphoma with better prognosis	MEDICINE	PATHOLOGY AND LABORATORY MED	$100,000
Kubal, Chandrashekhar Avinash	INDIANA UNIVERSITY HEALTH		MEDICINE	TRANSPLANT SURGERY	$618,311

CURRENT EXTERNAL FUNDING OPPORTUNITIES

Funding opportunities in this section include selected current grant announcements from federal agencies for new initiatives and changes to existing programs. Announcements with limited scope are not listed here but instead are sent directly to IUPUI School Deans. For comprehensive coverage of funding opportunities, please use the links to online search tools listed below.

U.S. DEPARTMENT OF DEFENSE (DOD)

Amyotrophic Lateral Sclerosis Research Program (ALSRP) Therapeutic Development Award: This opportunity supports the preclinical assessment of therapeutics for ALS. The proposed studies are expected to be empirical in nature and product-driven but may have a hypothesis-driven approach, provided the focus is on therapeutics. It is anticipated that the agents and/or data generated from these awards will lead to the advancement of new therapies for ALS. The FY15 award supports a wide range of post-discovery development activities ranging from post-discovery validation right up to IND submission. Supported activities must begin with lead compounds in hand and can include (1) secondary validation of leads obtained from screening or by other means to demonstrate target selectivity and mechanism of action, (2) optimization of potency and pharmacological properties and development of structure-activity maps via synthesis and testing of derivatives and sister compounds, (3) studies of formulation and stability, and/or (4) development of GMP production methods, (5) collection of data needed for Food and Drug Administration (FDA) Investigational New Drug (IND) applications to include compound characterization, absorption, distribution, metabolism, excretion (ADME) studies, and dose/response and toxicology studies. *Deadlines: Pre-Application: May 11, 2015; Application: August 20, 2015.*

NOTE: *All faculty, researchers, and scientists on continuing contracts at IU interested in applying for Department of Defense funding are eligible for assistance by the consulting firm Cornerstone Government Affairs, as arranged by the Vice President for Research. Those interested in securing assistance from Cornerstone must submit a two-page summary of their research project and a CV or biosketch to the VP for Research Office at vpr@iu.edu . Prior to submission, the IUPUI Office of the Vice Chancellor for Research is offering assistance with the two-page summaries. For more information, contact Ann Kratz, akratz@iupui.edu.*

U.S. DEPARTMENT OF ENERGY (DOE)

Reliable Electricity Based on ELectrochemical Systems (REBELS): This program seeks to disrupt traditional learning curves for distributed stationary power generation by introducing technology concepts that have the potential for significantly lower cost and that are capable of performance superior to current distributed generation technologies. Fuel cell technologies have been touted for decades due to their high chemical-to-electrical conversion efficiencies and potential for near-zero greenhouse gas emissions when fueled by hydrogen or operated as part of a carbon capture and storage (CCS) process. However, fuel cell technologies have not achieved widespread adoption due primarily to high cost relative to

incumbent combustion technologies. In this program, ARPA-E seeks to fund transformational fuel cell devices that operate in an intermediate temperature range in an attempt to 1) create new pathways to achieve an installed cost to the end-user of less than $1,500/kW at moderate production volumes, and 2) create new fuel cell functionality to increase grid stability and integration of renewable energy technologies such as wind and solar. *Deadline: Concept Paper: January 8, 2016.*

Stewardship Science Academic Alliances (SSAA): This program supports state-of-the-art research at U.S. institutions in areas of fundamental physical science and technology of relevance to the Stockpile Stewardship Program mission, with a focus on those areas not supported by other federal agencies. This opportunity seeks proposals in properties of materials under extreme conditions and/or hydrodynamics (condensed matter physics and materials science, and fluid dynamics); low energy nuclear science; and radiochemistry. The program objectives are: 1) Support the U.S. scientific community by funding research projects at universities that conduct fundamental science and technology research that is of relevance to Stockpile Stewardship; 2) Provide opportunities for intellectual challenge and collaboration by promoting scientific interactions between the academic community and scientists at the DOE/NNSA laboratories; and 3) Develop and maintain a long-term recruiting pipeline to the DOE/NNSA laboratories by training and educating the next generation of scientists in the fundamental research of relevance to Stockpile Stewardship and thereby increasing the visibility of the DOE/NNSA scientific activities to the U.S. academic communities. *Deadline: October 27, 2015.*

General Motors Foundation

The General Motors Foundation supports only programs that fall within the foundation's four key focus areas: education, health and human services, environment and energy and community development. Primary consideration is given to requests that meet the following criteria:
1. Exhibit a clear purpose and defined need in one of the foundation's four key focus areas.
2. Implement innovative approaches to address the defined need.
3. Demonstrate efficiency and the ability to follow through on the proposal.
Deadline: Continuous. http://www.gm.com/company/aboutGM/gm_foundation.html

NOTE:Faculty, researchers, and scientists interested in this funding opportunity may also consider pursuing a collaborative relationship that provides access to uniquedatafor appropriate research projects. This data has been collected from a broad spectrum of public safety personnel from various agencies in Indiana over the past two decades. Cardiovascular disease happens to be the primary cause of on-duty and lifetime mortality in firefighters (45% and 36% of deaths, respectively). Dataset includes: tobacco and alcohol use, diet, physical activity level, medications, immunization history, overall fitness, blood pressure, weight, lung function, blood analysis/lipids/glucose, urine analysis, psychological overview. Over 100,000 person years available. Data is currently being accessed for FEMA/Homeland Security study through Harvard School of Public Health. (S. Kales, Primary Investigator). To learn more about this data and explore the feasibility of a joint project for this funding opportunity, please contact Terry Zollinger , Professor Emeritus, Fairbanks School of Public Health, 317.278.0307 or tzolling@iu.edu).

NATIONAL INSTITUTES OF HEALTH

Role of Exosomes in HIV Neuropathogenesis (R01): This opportunity invites research grant applications focused on defining the central role of exosomes in the neuropathogenesis of Human Immunodeficiency Virus (HIV)-1 Associated

Neurocognitive Disorders (HAND) and determining the potential use of exosomes as biomarkers for HAND or as delivery vehicles for CNS-targeted therapeutics. Basic and translational research in domestic and international settings is of interest. Multidisciplinary research teams and collaborative alliances are encouraged but not required. Components of Participating Organizations: National Institute of Mental Health (NIMH) and National Institute of Neurological Disorders and Stroke (NINDS). *Deadlines: Letter of Intent: August 2, 2015; Application: September 2, 2015.*

Research Projects to Enhance Applicability of Mouse Models for Translational Research (R01): The purpose of this opportunity is to invite applications for projects to expand and improve the utility of mouse cancer and tumor models for translational research. The National Cancer Institute (NCI) supports many hypothesis-driven, mechanistic R01 projects that employ mice, or develop and use mouse cancer models or human-in-mouse tumor models for many aspects of oncology research. However, the NCI has not previously supported projects devoted to ensuring that mice and mouse models used for translational research questions are appropriate for those purposes and that the models provide reliable and informative data for patient benefit. Applications to this FOA could propose to overcome limitations of mouse and human-in-mouse oncology models, define a new translational use of models or mouse genetics for unmet needs, advance standard practices for modeling human cancers and tumors in mice and for validating and credentialing models, or develop widely applicable tool strains or resources that enable cross-species comparisons. *Deadline: June 5, 2015.*

NIH Transformative Awards (R01): The NIH Transformative Research Awards complement NIH's traditional, investigator-initiated grant programs by supporting individual scientists or groups of scientists proposing groundbreaking, exceptionally innovative, original and/or unconventional research with the potential to create new scientific paradigms, establish entirely new and improved clinical approaches, or develop transformative technologies. Little or no preliminary data are expected. Projects must clearly demonstrate the potential to produce a major impact in a broad area of biomedical or behavioral research. *Deadlines: Letter of Intent: September 10, 2015; Application: October 10, 2015.*

Technologies for Improving Health and Eliminating Health Disparities (R41/42): The purpose of this opportunity is to stimulate a partnership of ideas and technologies between innovative small business concerns (SBCs) and non-profit research institutions resulting in improving minority health and the reduction of health disparities by commercializing innovative technologies. Healthy People 2020 defines a health disparity as a particular type of health difference in the incidence, prevalence, morbidity, and burden of diseases and other adverse health outcomes that is closely linked with social, economic, and/or environmental disadvantage. NIH-defined health disparity population groups include racial/ethnic minorities, socioeconomically disadvantaged individuals, and individuals residing in rural areas. Appropriate technologies must be effective, affordable, culturally acceptable, and easily accessible to those who need them. *Deadlines: Letter of Intent: December 23, 2015; Application: January 23, 2016.*

NATIONAL SCIENCE FOUNDATION

Improving Undergraduate STEM Education (IUSE-EHR): This program invites proposals that address immediate challenges and opportunities that are facing undergraduate STEM education, as well as those that anticipate new structures (e.g. organizational changes, new methods for certification, course re-conception, cyberlearning, etc.) and new functions of the undergraduate learning and teaching enterprise. The IUSE program recognizes and respects the variety of discipline-specific challenges and opportunities facing STEM faculty as they strive to incorporate results from educational research into classroom practice and work with education research colleagues and social science learning scholars to advance our

understanding of effective teaching and learning. The program features two tracks: 1)Engaged Student Learning and 2) Institutional and Community Transformation. Two tiers of projects exist within each track: (i) *Exploration* and (ii) *Design and Development*. These tracks will entertain research studies in all areas. In addition, IUSE also offers support for a variety of focused innovative projects that seek to identify future opportunities and challenges facing the undergraduate STEM education enterprise. *Deadline: October 22, 2015.*

Critical Resilient Interdependent Infrastructure Systems and Processes (CRISP): This opportunity seeks proposals with transformative ideas that will ensure ICI services are effective, efficient, dependable, adaptable, resilient, safe, and secure. Successful proposals are expected to study multiple infrastructures focusing on them as interdependent systems that deliver services, enabling a new interdisciplinary paradigm in infrastructure research. Projects may undertake the collection of new data or use existing curated data depending on the category of award, and must recognize that a primary objective is integrative, predictive modeling that can use the data to validate the models and that can be integrated into decision making. Type 1 Awards: Theory, modeling, data collection and metrics projects that will create the knowledge, representations, methodologies, case studies and approaches to conceptualize and study interdependent infrastructures as processes, services and systems. Type 2 Awards: These proposals support interdisciplinary research to conduct major new interdependent infrastructure research using empirical data. They are expected to include the creation of knowledge, representations, methodologies and approaches to conceptualize and study interdependent infrastructures as processes, services and systems. *Deadline: March 20, 2016.*

Interdisciplinary Behavioral and Social Science Research (IBSS): This opportunity invites proposals for two different kinds of projects: 1) IBSS Large Interdisciplinary Research Projects - Large interdisciplinary research projects. 2) IBSS Interdisciplinary Team Exploratory Projects - Support for exploratory efforts by emerging multidisciplinary teams is designed to facilitate the kinds of contact, interaction, and active research activities necessary to enable researchers from multiple disciplines to engage in effective interdisciplinary research. Emphasis is to be placed on the conduct of research and potential outcomes, not on the preparation of plans and proposals for future research. Projects may address any topic, issue, or problem. Researchers are encouraged to pursue research on one of four cross-cutting themes (population change; sources of disparities; communication, language, and linguistics; and technology, new media, and social networks), but the IBSS competition will be open and receptive to other topics that address topics having theoretical and societal significance. Proposals should focus on basic research projects. Development of new methods, collection of new databases of broader value, engagement in education and training activities, and/or other forms of infrastructural activity may be a part of the project's activities, but the project's primary emphasis should be on scientifically exploring the validity of answers to focused, theoretically-based questions. *Deadline: December 2, 2015.*

Campus Cyberinfrastructure: Data, Networking, and Innovation Program (CC*DNI): The CC*DNI program invests in campus-level data and networking infrastructure and integration activities tied to achieving higher levels of performance, reliability and predictability for science applications and distributed research projects. Science-driven requirements are the primary motivation for any proposed activity. The CC*DNI program welcomes proposals in seven areas: (1) Data Infrastructure Building Blocks (DIBBs) - Multi-Campus/Multi-Institution Model Implementations; (2) Data Driven Networking Infrastructure for the Campus and Researcher; (3) Network Design and Implementation for Small Institutions; (4) Network Integration and Applied Innovation; (5) Campus CI Engineer; (6) Regional Coordination and Partnership in Advanced Networking; and (7) Instrument Networking. Participating NSF organizations: Division of Advanced Cyberinfrastructure (ACI) and Division of Computer and Network Systems (CNS) in the Directorate for Computer & Information Science & Engineering (CISE). *Deadline:*

March 26, 2016.

U.S. DEPARTMENT OF ENERGY (DOE)

Stewardship Science Academic Alliances (SSAA): This program supports state-of-the-art research at U.S. institutions in areas of fundamental physical science and technology of relevance to the Stockpile Stewardship Program mission, with a focus on those areas not supported by other federal agencies. This opportunity seeks proposals in properties of materials under extreme conditions and/or hydrodynamics (condensed matter physics and materials science, and fluid dynamics); low energy nuclear science; and radiochemistry. The program objectives are: 1) Support the U.S. scientific community by funding research projects at universities that conduct fundamental science and technology research that is of relevance to Stockpile Stewardship; 2) Provide opportunities for intellectual challenge and collaboration by promoting scientific interactions between the academic community and scientists at the DOE/NNSA laboratories; and 3) Develop and maintain a long-term recruiting pipeline to the DOE/NNSA laboratories by training and educating the next generation of scientists in the fundamental research of relevance to Stockpile Stewardship and thereby increasing the visibility of the DOE/NNSA scientific activities to the U.S. academic communities. *Deadline: October 27, 2015.*

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

Strategies for Increasing Ignition Interlock Use Among DWI Offenders: The main objective of this opportunity is to measure the effectiveness of a strategy in increasing interlock use as deployed by a jurisdictional site (State, county, court system). The contractor shall gather information on interlock programs across a range of sites to identify and recruit a site that is willing or about to deploy a strategy for increasing interlock use. The contractor shall partner with a site and assess changes in program measures of performance prior to, during and after the strategy is deployed. *Deadline: July 23, 2015.*

IDENTIFYING FUNDING OPPORTUNITIES

On-line search tools are available to IUPUI investigators who are interested in identifying funding opportunities in their areas of interest.

Community of Science (COS): COS is a primary on-line search tool for identifying funding opportunities. To take advantage of this tool, register at http://www.cos.com/login/join.shtml. Once you have completed the short registration process, you can personalize your search by selecting the option entitled "launch your workbench". You can access federal, local, corporate, foundation, nonprofit and other funding opportunities using key terms and save the results of up to 20 searches and have them delivered to you weekly via email.

National Institutes of Health (NIH) "NIH Guide": To take advantage of this search tool, register at http://grants.nih.gov/grants/guide/listserv.htm. It allows you to receive discipline specific funding opportunities that are delivered to you weekly via email.

National Science Foundation (NSF) "MyNSF": To take advantage of this search tool, register at http://service.govdelivery.com/service/multi_subscribe.html?code=USNSF&custom_id=823. It allows you to receive discipline specific funding opportunities that are delivered to you weekly via email.

Federal Business Opportunities "FedBizOpps": FedBizOpps is the single government point-of-entry for Federal government procurement opportunities over $25,000. To take advantage of this search tool, visit https://www.fbo.gov. Opportunities found at this site include, but are not limited to, presolicitations and special notices for research and service contracts for specific projects and some national centers and surveys that would not be found in Grants.gov and may not be found in the Community of Science.

Limited Submission Funding Opportunities:

Many federal agencies and foundations offer grants, awards and fellowships that limit the number of applications that can come from one institution or require special handling. In order to comply with agency and foundation guidelines and increase the chances of Indiana University (IU) succeeding in such limited submissions and special handling opportunities, IU policies and procedures are in place and are utilized by the Office of the Vice Chancellor for Research and other IU research offices to facilitate internal coordination and competitions.

Individuals interested in responding to limited submission opportunities must inform the Office of the Vice Chancellor for Research about their intent to apply to a given limited submission opportunity, such that they can be included in the internal review and selection process. Failure to do so may disqualify individuals from consideration for submission to the funding opportunity.

Individuals interested in a limited submission opportunity or have any questions about the internal coordination process, contact Etta Ward at emward@iupui.edu or 317-278-8427. For a description of upcoming limited submission funding opportunities, as well as guidelines and application forms, go to: http://research.iu.edu/limited_sub.shtml. Please note that this is not a comprehensive list, and that any external funding opportunity that imposes any type of submission limitation is subject to the IU limited submission policy and procedures.

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