

Research Enterprise

April 18, 2014

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.

Research Offices:

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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.

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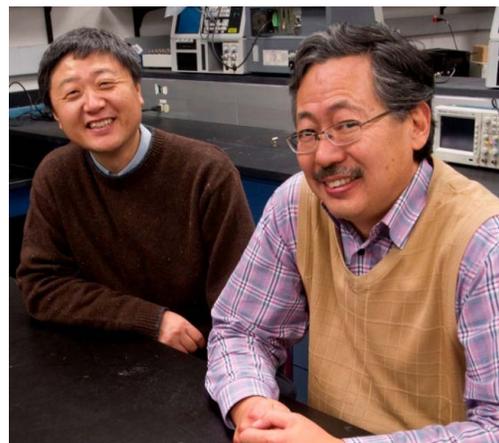
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FEATURE STORY

IURTC Spin Up Company YC Bioelectric receives \$307,787 award from the National Institutes of Health

YC Bioelectric LLC received a Notice of Award from the National Institutes of Health for its Phase I Small Business Technology Transfer proposal, "Multi-Blot Western Device." The award will provide \$307,787 of funding over a 12-month period for the development and commercialization of this novel device.

Drs. Stanley Chien and Hiroki Yokota, both faculty at the Purdue School of Engineering and Technology, co-founded YC Bioelectric through the Indiana University Research & Technology Corp.'s Spin Up Program. Their work will significantly improve the speed and accuracy of a technique, widely used in molecular biology labs, called a Western blot.



(left to right) Stanley Chien, Ph.D. and Hiroki Yokota, Ph.D.

"This is a great story about scientists, an electrical engineer and biomedical engineer, collaborating across disciplines to solve a real-world problem," said Joe Trebley, head of IURTC's Spin Up Program.

Dr. Chien and Dr. Yokota's work was initially funded through an internal granting mechanism at IUPUI called Funding Opportunities for Research Commercialization and Economic Success. The co-founders used the initial funds to develop and build a prototype device.

"We are delighted that the internal grant program played a key role in enabling these researchers to transform their research findings into commercially viable outcomes," IUPUI Vice Chancellor for Research Kody Varahramyan said.

In June 2012, YC Bioelectric received an exclusive option to intellectual property filed through the IURTC, and in February 2014, YC Bioelectric received a notice of

allowance on its lead patent US 13/282,030.

"With funding from the NIH and the allowed patent, YC Bioelectric has a lot of momentum right now," Dr. Yokota said.

Over the next 12 months, YC Bioelectric will be developing versions of its prototype that other researchers can test in their labs. Once the prototype is validated in external labs, YC Bioelectric will seek follow-on financing from investors and through the NIH's Phase II Small Business Technology Transfer.

"There is a lot of potential here, and we are very thankful to IUPUI, IURTC and the NIH for the support they have provided," Dr. Chien said.

ANNOUNCEMENTS

2014 IUPUI Research Day Celebrated Research and Creative Activity at IUPUI

On April 11, [the Office of the Vice Chancellor for Research](#) in collaboration with the [IUPUI Center for Research and Learning](#) and the [IUPUI Solution Center](#) hosted the sixth annual [2014 IUPUI Research Day](#), a daylong open-house celebration of IUPUI research and creative activity held at the IUPUI Campus Center. The theme this year was "Research and Creative Activity Matter: From IUPUI to the World."



Richard Blanco Acclaimed Cuban-American Poet, President Obama's 2013 Inaugural Poet



Vice Chancellor Kody Varahramyan and Dr. Yuichiro Takagi

Research Day

commenced in the morning with a plenary session kicked off by Vice Chancellor for Research Kody Varahramyan with a welcome and opening remarks. Stephan Viehweg, interim director of IUPUI Center for Translating Research Into Practice, served as the session's moderator. There were two presentations by recipients of the 2014 Research Frontiers Trailblazer Award, a program that recognizes outstanding IUPUI researchers who are showing great promise in becoming nationally and

internationally known for their accomplishments in advancing the frontiers of knowledge. The recipient [Yuichiro Takagi](#), Ph.D., from the IU School of Medicine presented his research on "Protein-engineering and structural biology of molecular machineries in gene expression," and [Alexey Kuznetsov](#), Ph.D., from the School of Science presented his research on [midbrain dopaminergic neuron](#).

A student speaker presentation was given by [Kendrea Williams](#), an outstanding student who has made a tremendous impact in her community and on the IUPUI campus. She presented some of her work conducted in the community as an undergraduate research scholar, and expressed gratitude for the research opportunities provided by IUPUI. This was followed by an exceptional keynote presentation by [Mr. Richard Blanco](#), President Obama's 2013 Inaugural Poet. Mr. Blanco is internationally known as a poet, author and civil engineer who, as a keynote speaker, connected the audience to a wistful portrait of his memories through poetry and storytelling.



Kendrea Williams

Research Day included [two poster sessions](#), consisting of 300 posters and exhibits, showcasing the innovative research of IUPUI faculty, staff, and

students (graduate, professional and undergraduate). Close to 100 faculty participated in the "Grand Challenge Initiative Research Roundtable Discussions," which were facilitated roundtable discussions on the six main topics associated with the IUPUI Grand Challenge Initiative on Urban Health and Wellbeing.

New this year was the first annual "[JagTalks](#)", a series of short but dynamic presentations delivered by four IUPUI faculty members about their research projects:



Dr. David Marrero at JagTalks

[Robin Hughes](#), Ph.D., associate professor of [Higher Education Student Affairs \(HESA\)](#) in the [School of Education](#), presented the topic "Deconstructing ballin': Sporting participation in education" about the misconceptions and myths surrounding student athletes. [David G. Marrero](#), Ph.D., J.O. Ritchey Endowed Professor of Medicine in the School of Medicine, discussed the topic "Translating Diabetes to Public Health," demonstrating how through his research a successful program at the [YMCA](#) was implemented to assist in the identification of persons at risk for diabetes followed by educational and behavioral interventions focused on diet and exercise. [Khadija Khaja](#), Ph.D., associate professor in the School of Social Work and faculty fellow for the Common Theme Project "[Find Your Voice. Hear My Voice.](#)" displayed her passion for international research regarding the "Social Service Needs Among Muslims." [Sheila Suess Kennedy](#), professor of Law and Public Policy in the School of Public and Environmental Affairs, examined the topic "Researching Our Civic Deficit," which focused on the personal, political and civic consequences of our "civic deficit" and the reasons it persists.

The 2014 IUPUI Research Day celebrated the zeal and excitement cultivated by the cutting-edge and multifaceted research and scholarly activities at IUPUI. Close to 700 people were in attendance, including 140 high school students and accompanying teachers/administrators. Research Day is a great way for IUPUI, faculty, staff, and students, and their academic, industrial, governmental partners, and the broader community, to come together and learn more about the research enterprise at IUPUI, explore new collaborations, and lay the foundation for new partnerships.

As the Office of the Vice Chancellor begins planning for the seventh 2015 annual IUPUI Research Day event, participants and the broader IUPUI community are encouraged to send feedback and suggestions to OVCR@iupui.edu.

IUPUI Announces 2014 Research Frontiers Trailblazer Award Winners

On April 11th, winners of the 2014 Research Frontiers Trailblazer Awards received honors at IUPUI Research Day for research on mathematical modeling and transcriptional regulation and structural biology. Associate professor of Mathematical Sciences Alexey Kuznetsov and associate professor of *Biochemistry and Molecular Biology* Yuichiro Takagi each received a \$1,000 cash prize to support their research.

Professor Kuznetsov is a world leader in the mathematical modeling of certain neuron types and in the use of nonlinear dynamics to understand biological patterns. His research is part of a USA-France collaborative project that seeks to develop mathematical models of reward-based learning and



behavior to elucidate the mechanisms controlling drug abuse and, more specifically, the influence of alcohol on the central dopamine system.

Dr. Kuznetsov and his colleagues have been very successful in developing models that have progressively greater agreement with experimental findings, allowing them to explain the mechanisms underlying dopamine response and to make predictions on reward signaling that may help to treat drug abuse. In addition to his research on dopaminergic neurons, Dr. Kuznetsov also seeks to utilize mathematical techniques to identify new mechanisms that explain the behavior of fundamental gene regulatory systems. These efforts could eventually be used by experimentalists to tune the properties of biological systems.

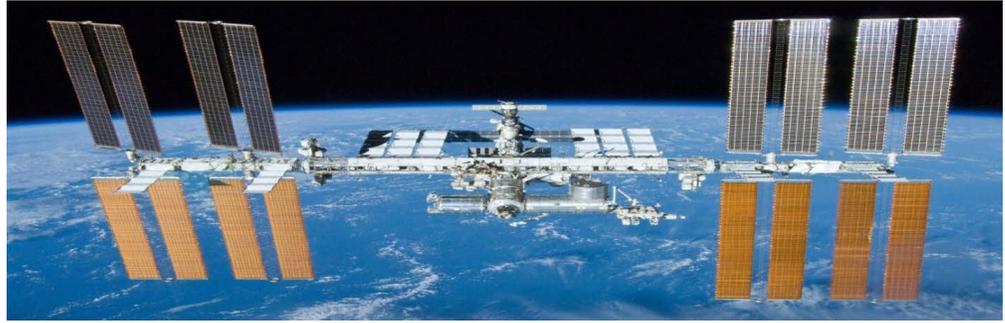


Professor Takagi is recognized internationally in the areas of transcriptional regulation and structural biology as he strives to understand one of the most fundamental life processes, namely how a cell's genetic information is copied from sections of DNA, through a process called transcription, and used to eventually produce the proteins necessary for cellular function. To understand how transcription is regulated, Dr. Takagi devised a highly ambitious plan to solve the structure of the Mediator protein complex, which activates transcription in eukaryotes. Dr. Takagi's early work on the Mediator complex contributed to the body of work that earned Professor Roger Kornberg the Nobel Prize in Chemistry in 2006.

Further, Dr. Takagi's seminal work determining the structure of the head portion of the Mediator complex was published in *Nature* and has had a tremendous impact on his field. Dr. Takagi's research has also opened up the opportunity for technological breakthroughs in protein expression that, when commercialized, will efficiently provide high quality proteins for biological research. While this effort would be enough for any ordinary researcher, Dr. Takagi has also successfully conducted research in two additional areas: the mechanism underlying Mediator behavior and the physiologic role of transcription factor, TFIIH.

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.

NASA Destination Station Day - April 29, 2014



[Destination Station](#) is NASA's International Space Station Program national awareness campaign that promotes research opportunities, educates communities about activities performed on the International Space Station, and communicates the real and potential impacts of the station on our everyday lives. NASA representatives will be at IUPUI to talk about possible opportunities for university researchers to conduct research aboard the space station. They also would like to learn more about the IUPUI research enterprise.

Agenda

8:00-9:15 a.m.	Breakfast Meeting
9:30-10:45 a.m.	Presentation to Researchers (including Q&A) – University Library, Lilly Auditorium
10:45-11:00 a.m.	Break
11:00-11:45 a.m.	Meeting with Students
12:00-1:15 p.m.	Lunch Meeting
1:15-4:30 pm.	Tour of Facilities and Meetings with Multiple Research Groups

Register: <https://crm.iu.edu/CRMEvents/NASADestinationStation/>

Questions can be directed to Sue Cassidy (sucassid@iupui.edu), Office of the Vice Chancellor for Research.

2015 Vilcek Prizes for Creative Promise in Biomedical Science

The Vilcek Foundation is seeking applicants for the 2015 Vilcek Prizes for Creative Promise in Biomedical Science. Applications are sought from young, foreign-born researchers age 38 and under from now through June 10, 2014. Three winners will each be awarded a \$50,000 unrestricted cash prize.

The Vilcek Prizes for Creative Promise were established in 2009 as a complement to the Vilcek Prizes, to encourage and support young immigrants who have already demonstrated exceptional achievements and who often face significant challenges early in their careers. The Creative Promise Prizes are awarded annually in biomedical science and in a changing category of the arts, this year recognizing accomplishments in the field of fashion.

Learn more at <http://www.vilcek.org/prizes/creative-promise/index.html#sthash.7vdV74Uz.dpuf>. Questions can be directed to Phuong Pham at (212) 472-2500 or at creativepromise@vilcek.org.

FACULTY SPOTLIGHT

IU Researchers Identify Key Molecular Factors in Heart Development, Related Birth Defects

Researchers at the [Indiana University School of Medicine](#) have identified a series of molecular signals that control a crucial process of heart development spanning a period from shortly before birth into the post-natal period.

The research reveals for the first time how the wiring for the body's sympathetic nervous system -- the so-called "fight or flight" system -- gets installed into the still-developing newborn heart and the important role it plays in heart function. The research was published March 24 by the [Proceedings of the National Academy of Sciences](#).



Simon J. Conway, Ph.D.

The research, by professor of pediatrics Dr. Simon J. Conway, and his colleagues sheds new light on a poorly understood period of heart development shortly before and after birth, when sympathetic nerves colonize and are assimilated into the developing fetal heart.

Disruption of this system can have deadly consequences, Dr. Conway said, including significant slowing of the heartbeat, known as bradycardia, and electrophysical problems. These birth defects mimic a rare disease called LEOPARD syndrome, in which patients have a disruptive mutation in the signaling protein SHP-2.

Using a series of mouse models of cardiac development bred to enable specific genes to be "knocked out" in specific tissues and at defined ages, the researchers determined that SHP-2 plays a key role in the development process. Lack of SHP-2 caused a cascade of molecular signals that resulted in the significant reduction of another downstream protein called pERK.

Using an additional mouse model, the researchers were able to reverse the nerve maldevelopment and bradycardia issues by restoring production of the pERK protein even in mice with the SHP-2 mutation.

"These mouse models bring us closer to understanding the causes of these birth defects and treating human patients with such mutations," said Dr. Conway, noting that certain compounds can promote pERK protein production, although much work would need to be done to enable them to target the proper heart tissues.

Dr. Conway is an investigator at the [Herman B Wells Center for Pediatric Research](#).

Additional authors include first author Jacquelyn D. Lajiness, Paige Snider and Jian Wang of the IU School of Medicine; Gen-Sheng Feng of the University of California San Diego; and Maiké Krenz of the University of Missouri.

The research was supported in part by American Heart Association predoctoral grant 13PRE16920038, the Riley Children's Foundation, Indiana University Department of Pediatrics (Neonatal-Perinatal Medicine) and National Institutes of Health grant R01HL60714.

STUDENT SPOTLIGHT

Biology Student Builds Clear Path to Future Career

Sophomore Brandi Herron (Biology, '16) is a planner—always thinking about the bigger picture, what's her next step and how she can make an impact.

When Herron plays her flute—a hobby of eight years—she's not just making beautiful music. She's preparing her hands and mind for the intricate manual dexterity it takes to become an orthodontist. And when she chose to attend IUPUI School of Science, she knew the research opportunities that begin freshman year would give her an advantage when pursuing graduate school.

With a year of the Biology Freshman Work Program under her belt, Herron is now exploring the microbiology behind dentistry through a [Life-Health Sciences Internship](#) (LHSI) research project.



Brandi Herron (right) collaborates with fellow students.

"My research project is looking at how nicotine affects the cardiovascular system by increasing the amount of bacteria in your mouth and how it travels into your blood stream," Herron explained. "I'm getting that little taste of how the biology relates to the dentistry."

These research opportunities and the close-knit environment among students and faculty have made Herron proud of her decision to attend IUPUI.

"It's neat to know they care a little more, so it makes it more personal," she said of her professors. "Coming from a small school, I really like that." Herron graduated as her class valedictorian from Churubusco High School in northern Indiana.

Now Herron is making the School of Science experience more personal for others as part of the [Science Ambassador Leadership Team](#) (SALT).

"We work not only with prospective students, but also with current students to help tell what the School of Science is really about," she said.

So what does she want prospective students to know?

"You don't want to have your college experience just be college. Going to classes all the time really isn't the highlight of my undergraduate career," she said. "It's more of what I do in my spare time, such as research and making friends."

She's found those connections through coursework and her time in the lab, but also the many student organizations such as [Biology Club, Chemistry Club and Pre-Dental Club](#).

"It's still such a big school...(but) it doesn't feel like it," she said. "We're so close—I know everyone who's in my labs. I know the majority of the people in my big lectures now."

When Herron isn't spending time researching or with friends, she also likes to volunteer with organizations throughout the city. It's that desire to give back that ultimately led her to the School of Science. She credits her hometown orthodontist for her decision to pursue pre-dentistry.

"He would explain things to me—more than I feel I cared to know at the time, but it was really interesting to me," she said. "It's just a way you can apply that kind of science to helping people."

TRANSLATIONAL RESEARCH IMPACT

Engineer Finds Inspiration in Road Signs, Warning Labels to Design More Effective Medical Records

A human factors engineer at the Regenstrief Institute, which is closely affiliated with the IU School of Medicine, is the author of a new study that says small changes to medical records inspired by unlikely sources -- such as road signs -- can have big impact on human health.

Dr. Alissa L. Russ is the first author on [a paper published online in the Journal of the American Medical Informatics Association](#) that describes how design changes to medication alerts in a simulated electronic medical record resulted in safer prescribing, increased efficiency and reduced workload for health care providers who placed drug orders.



Alissa L. Russ, Ph.D.

"The VA electronic medical record system is one of the most widely used and respected EMR systems in the country," said Dr. Russ, who is also a research scientist at the Richard A. Roudebush Veterans Affairs Medical Center and adjunct assistant professor at the Purdue College of Pharmacy. "This EMR is used by providers at over 150 VA hospitals. We are looking at ways to improve the alert system for these providers and for patient care."

In the study, investigators used knowledge from other industries and applications, such as the design of traffic control devices and medication warning labels, to redesign medication alerts, such as drug allergy and drug-drug interaction warnings. Several changes were incorporated, including the use of concise language and a table-like format to help providers scan for information quickly.

Some of the redesigned alerts also presented more detail, such as a patient's previous symptoms and lab results, so providers did not have to search for this information elsewhere in the patient's electronic medical record. In addition to adopting safer prescribing practices, doctors, nurse practitioners and clinical pharmacists reported higher satisfaction with the redesigned display and the quality of the information presented.

These types of design changes can help providers pay attention to alerts and may reduce some aspects of alert fatigue, according to Dr. Russ.

The investigators used methods developed in human factors engineering to study the alerts and found that prescribers who participated in the simulation sometimes inadvertently canceled a medication when they thought they were ordering it -- or, vice versa, unintentionally ordered a drug, depending on the alert design. These findings have not previously been reported for medication alerts. All patients in the study were fictitious, allowing researchers to safely test the design changes.

The study authors noted that good alert design may offer better cognitive support during busy patient encounters and may help providers extract information quickly, while a poor design may cause prescribers to prematurely dismiss alerts. They also found that repeating alerts in the same ordering session for a given patient did not substantially reduce prescribing errors.

"Serious gaps remain in understanding how to effectively display medication alert information to prescribers. In our study, prescribing errors significantly declined with the redesign, but the number of these errors remains too high. So our next step, which we have already begun, is to learn more about the decision-making process that providers go through when they encounter medication alerts," Dr. Russ said. "An improved understanding of this process will enable us to design even better

alerts, with the end goal of enhancing patient safety."

In addition to Dr. Russ, IUSM faculty members Michael Weiner, M.D., and Joanne K. Daggy, Ph.D., and School of Informatics and Computing faculty member Bradley N. Doebbeling, M.D., are [among the study authors](#).

OVCR EVENTS AND WORKSHOPS

Working with Industry on Applied Research & Creative Activity

When: Friday, April 25, 2014 | 1:00pm - 2:30pm

Where: University Library, Room 1126

This session will provide participants with an overview of services provided by the Office of the Vice Chancellor for Research that help link faculty researchers to industry partners for potential collaborations. Although this information session is geared toward new to mid-career faculty/researchers with a desire to work with industry, all faculty are welcome to attend. The following topics will be discussed: Research vs. applied research; Benefits of collaboration; How much industry research is currently being conducted at IUPUI; What industry looks for in applied research; What industry looks for in an applied researcher.

Registration: <https://crm.iu.edu/CRMEvents/Industry/>

OTHER EVENTS AND WORKSHOPS

Workshops on Scientific Communication - Save the Date! Friday, May 2

Morning Plenary: Distilling Your Message

[8:00 AM - 9:30 AM](#) | Emerson Hall Auditorium, room 304

In this interactive lecture, faculty members from the [Alda Center for Communicating Science](#) will provide the tools necessary to translate your scientific research for any audience. Participants will practice finding common ground with an audience, speaking at different levels of complexity for different audiences, and answering questions about their work. Attendance at the morning plenary is a prerequisite to participate in one of the small-group sessions.

The Alda Center for Communicating Science works to enhance understanding of science by helping train the next generation of scientists and health professionals to communicate more effectively with the public, public officials, the media, and others outside their own discipline.

Small Group Sessions

CHOOSE ONE: [9:45 AM](#), [12:30 PM](#), or [2:45 PM](#) | Daly 174 & 175

In addition to their morning lecture, the Alda Center for Communicating Science r will be leading small groups of faculty and learners through a hands-on session designed to improve their scientific communication strategies.

Participants will be required to bring an abstract of their own research and work with a partner to make their message clear and understandable to both funders and the public. Faculty will leave the workshop with an 'elevator pitch' about their research.

Sponsored by the IU School of Medicine, this event is free and open to all faculty, postdocs, fellows, and learners throughout the IUSM and IUPUI community. Seats are limited, and pre-registration is required!

Register: <https://faculty.medicine.iu.edu/registration/indexDirect.asp?id=1214>

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 2014

PI	Agency	Project Title	School	Department	Total
Howes, Patricia	INDIANA DEPARTMENT OF CHILD SERVICES	Indiana University/Department of Child Services Training Partnership	SOCIAL WORK	SOCIAL WORK	\$9,443,109
Hashino, Eri	NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMM. DIS	Modeling Inner Ear Differentiation with Pluripotent Stem cells	MEDICINE	OTOLARYNGOLOGY & H/N SURGERY	\$2,185,943
Shekhar, Anantha	TAKEDA PHARMACEUTICALS NORTH AMERICA, INC.	Strategic Pharma-Academic Research Consortium (SPARC) for Translational Medicine-Lilly	MEDICINE	CTSI AUXILIARY UNITS	\$2,000,000
Shekhar, Anantha	ELI LILLY AND COMPANY	Strategic Pharma-Academic Research Consortium (SPARC) for Translational Medicine-Lilly	MEDICINE	CTSI AUXILIARY UNITS	\$2,000,000
Roach, Peter J.	NATIONAL INSTITUTE NEUROLOGICAL DISORDERS & STROKE	Glycogen Metabolism and Lafora Disease	MEDICINE	BIOCHEMISTRY/MOLECULAR BIOLOGY	\$1,692,256
Matei, Daniela Elena	NATIONAL CANCER INSTITUTE	An Epigenetic Strategy for Restoring Carboplatin Sensitivity in Ovarian Cancer	MEDICINE	HEMATOLOGY/ONCOLOGY	\$1,618,500
Asirwa, Fredrick Chite	INDIANA HEMOPHILIA & THROMBOSIS CTR, INC	AMPATH Non-Malignant Hematology Program	MEDICINE	CANCER CENTER	\$225,000
Grommon, Eric	ENGLITY	TECHNOLOGY OPERATIONAL EVALUATION AND DEMONSTRATION (TOED) PROJECTS	PUBLIC & ENVIRONMENTAL AFFAIRS	PUBLIC & ENVIRONMENTAL AFFAIRS	\$165,485
Skiles, Jodi Lynn	LEIDOS INC.	Vincristine Optimization in Kenyan Children with Cancer	MEDICINE	CANCER CENTER	\$161,075
Fallon, Robert J	CHILDREN'S HOSPITAL OF PHILADELPHIA	Cancer Trials Support Unit (CTSUS) Phase II Supplemental Payments (N02-CM-62212)	MEDICINE	PED-HEMATOLOGY/ONCOLOGY	\$126,720
Stenson, Katherine White	INDIANA STATE DEPARTMENT OF HEALTH	Adaptation of a group diabetes prevention program for individuals with Spinal Cord Injury: A pilot study for feasibility and efficacy	MEDICINE	PHYSICAL MEDICINE & REHAB	\$120,000
Mirmira, Raghu G	LILLY RESEARCH LABS		MEDICINE	PED-ENDOCRINOLOGY BASIC RES	\$117,432
Tomlin, Angela M	INDIANA STATE DEPARTMENT OF HEALTH	Early Childhood Comprehensive System Planning	MEDICINE	PED-CHILD DEVELOPMENT CENTER	\$114,523
Howenstine, Michelle S	CYSTIC FIBROSIS FOUNDATION THERAPEUTICS INC.	Cystic Fibrosis Foundation Therapeutics Development Network 2014	MEDICINE	PED-PULM CRITICAL CARE/ALLERGY	\$113,162
Osili, Una O	SALVATION ARMY	Developing a Human Needs Index Phase 2	PHILANTHROPY	PHILANTHROPY	\$103,216
Navari, Rudolph M	KENNETH RAININ FOUNDATION	Gastric Control of Intestinal Function	MEDICINE	IUSM-SOUTH BEND	\$100,000

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 are, instead, sent directly to IUPUI School Deans. For comprehensive coverage of funding opportunities please use the on-line search tools listed below.

DEPARTMENT OF DEFENSE

Amyotrophic Lateral Sclerosis research Program-Therapeutic Development

Award: This program 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 mechanism is designed to support preclinical testing and development of therapeutics for ALS. Applications must include preliminary data relevant to the phase(s) of the preclinical development process covered by the proposed research. The application should include a clear statistical plan of analysis, if appropriate. Applicants must clearly and explicitly articulate what impact the project may have on therapeutic development for ALS. Clinical trials will not be supported with this Program Announcement/Funding Opportunity. *Deadlines: pre-application: May 13, 2014; application: August 20, 2014.*

Care for the Critically Injured Burn Patient: The objective of this announcement is to explore innovative approaches to accelerate the translation of advances in knowledge into new standards of care for the treatment of the injured warfighter who sustains burn injuries. The results of the research funded through FY13 Care for the Critically Injured Burn Patient II (CCIBPII) Program Announcement/Funding Opportunity are expected to increase the body of knowledge available to professionals and practitioners in health, medical science and related fields. *Deadline: October 16, 2014.*

Multifunctional Quantum Transduction of Photons, Electrons, and Phonons:

The objective of this topic is to develop a quantum technology that expands the capabilities afforded by optomechanical devices by adding active control of the mechanical degrees of freedom via electronic signals in both the classical and quantum regimes. Develop coherent electronic control of both photonic and phononic quanta using electrically-based quantum circuits such as superconducting qubits, or optical or phononic control of synthetic or naturally-occurring atomic defect spin states. Provide multi-field quantum transduction linking electronics, spintronics, mechanics and photonics, and demonstrate quantum control of phonons, enabling photon-like manipulation of this degree of freedom. This quantum transducer should yield (1) high-bandwidth transmission and reception of optically-encoded, quantum-encrypted information, providing secure high-bandwidth communication; (2) the development of coherent coupling between hybrid quantum systems, and (3) new integrated means for quantum information storage and processing.

Photonic and optomechanical structures have been largely based on Si and SiN. Other materials should be considered, e.g., SiC and AlN, which are now available as high-quality thin films with desirable optical properties, tunable electronic spin, and provide strong piezoelectric response. Properly harnessed, the piezoelectric response enables strong coupling of electrical signals to mechanical motion at microwave frequencies, affording a new mode for high-speed information transfer between photons and quantum-controlled phonons. A focused effort should explore the capabilities of such "3-field" systems. This will require materials processing; quantum structures; coupling modalities; theory; and simulation tools incorporating

all degrees of freedom. Strong electro-optomechanical coupling, with quantum control over electronic, spintronic, photonic and phononic degrees of freedom, should be achievable. Very high bandwidths for quantum-entangled photonic states may be achieved using such devices. These also should provide new transduction mechanisms for coupling hybrid quantum systems. *Deadlines: White Paper, October, 15, 2014; Submission, December 16, 2014.*

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-- arranged by the Vice President for Research. Those interested in securing assistance from Cornerstone must submit a 2 page summary of their research project and a CV or biosketch to the VP for Research Office at vp@iu.edu. Prior to submission, the IUPUI Office of the Vice Chancellor for Research is offering assistance with the 2 page summaries. For more information, contact Ann Kratz akratz@iupui.edu.

NATIONAL ENDOWMENT FOR THE HUMANITIES

Digital Topics for the Public: The Digital Projects for the Public program supports projects such as websites, mobile applications, games, and virtual environments that significantly contribute to the public's engagement with humanities ideas. Projects must be analytical and deeply grounded in humanities scholarship in a discipline such as history, religion, anthropology, jurisprudence, or art history. Digital Projects for the Public grants support projects that are largely created for digital platforms. While these projects can take many forms, shapes, and sizes, you should apply to this program primarily to create digital projects or the digital components of a larger project. NEH is a national funding agency, so these projects should demonstrate the potential to attract a broad, general audience. Projects can have specific targeted audiences (including K-12 students), but they should also strive to cultivate a more inclusive audience. *Deadline: June 11, 2014.*

NATIONAL INSTITUTES OF HEALTH

Image-Guided Drug Delivery in Cancer (R01): This Funding Opportunity Announcement (FOA) will support innovative research projects that are focused on image-guided drug delivery (IGDD), including real-time image guidance, monitoring, quantitative in vivo characterizations and validation of delivery and response. It will support research in development of integrated imaging-based platforms for multifunctional and multiplexed drug delivery systems in cancer and other diseases, quantitative imaging assays of drug delivery, and early intervention. **Participating Organizations:** National Cancer Institute (NCI) National Institute of Biomedical Imaging and Bioengineering (NIBIB). Sponsor ID: PAR-13-185. *Deadlines: June 19 & November 19, 2014.*

Biophysical & Biomechanical Aspects of Embryonic Development (R01): This announcement encourages applications from institutions/organizations that propose to advance our knowledge in the area of the physics and mechanics of embryonic development. Applicants must propose hypothesis-driven developmental research with the prospect of gaining new and critical information about tissue mechanics relevant to vertebrate development and understanding the basis for developmental disorders. Investigators are encouraged to explore approaches and concepts new to the area of developmental tissue mechanics, and use newly developed techniques superior to the ones currently used in the field. It should be noted that applications using the NIH R01 grant mechanism will require sufficient preliminary data to substantiate the validity of the proposed research and feasibility of new technologies

or tools. **Participating Organizations:** Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) National Heart, Lung, and Blood Institute (NHLBI) National Institute of General Medical Sciences (NIGMS) *Deadline: September 17, 2014.*

Modeling the Scientific Workforce (U01): This announcement solicits cooperative agreement applications that propose to develop computational models for better understanding of the dynamics of the scientific workforce in the United States. These models may be used to inform program development and management, identify questions that need additional research, and guide the collection and analysis of the data to answer these questions. **Participating Organizations:** National Institute of General Medical Sciences (NIGMS) Office of Behavioral and Social Sciences Research (OBSSR). *Deadlines: Letter of Intent: January 4, 2015; Application: February 4, 2015.*

NATIONAL SCIENCE FOUNDATION

Information & Intelligent Systems (IIS): Core Programs: IIS supports three core programs: ***Cyber-Human Systems (CHS)*** CHS research explores potentially transformative and disruptive ideas, novel theories and technological innovations in computer and information science that accelerate both the creation and our understanding of the complex and increasingly coupled relationships between humans and computing with the broad goal of advancing human capabilities: perceptual and cognitive, physical and virtual, social and societal. ***Information Integration and Informatics (III)*** The III program supports research to realize the full transformative potential of data, information and knowledge in this increasingly digital and interconnected world. III-funded projects may address data of unprecedented scale, complexity, and rate of acquisition, as well as issues of heterogeneity and complexity with innovative approaches and deep insights. Projects may support the diverse functionalities and processing needs for data, information and knowledge from disparate and uncoordinated sources, or cope with the changing landscape of computing platforms at scales ranging from small mobile devices to potentially global-scale cloud and networked computing resources. ***Robust Intelligence (RI)*** The RI program advances and integrates the research traditions of artificial intelligence, computer vision, human language research, robotics, machine learning, computational neuroscience, cognitive science, and related areas. Researchers across all areas of RI are addressing progressively richer environments, larger-scale data and more diverse computing platforms, and more sophisticated computational and statistical approaches, looking to nature in many cases to model cognitive and computational processes. Interactions across traditional disciplines are also of increasing importance. *Deadline: November 12, 2014.*

EarthCube: Developing a Community-Driven Data & Knowledge Environment for the Geosciences: This is the third Amendment to the EarthCube solicitation, seeking proposals in two focus areas. 1) EarthCube Research Coordination Networks (RCN). RCNs are virtual organizations for geoscientists to coordinate, plan and prioritize cyberinfrastructure activities, and 2) Building Blocks: Refining, connecting, and testing integrative technologies within the geosciences community. 1) EarthCube RCNs are intended to advance geosciences cyberinfrastructure through interaction, discussion and planning between geoscientists and cyberinfrastructure experts. RCNs provide opportunities for academic geosciences communities to organize, seek input, come to consensus and prioritize data, modeling, and technology needs. Other opportunities exist to realize cyberinfrastructure development and build tools and services. Outcomes must be tangible and directed towards moving geoscientists closer to shared goals. RCNs are an important information and feedback mechanism within the EarthCube process. Results from these projects will influence the direction of EarthCube, including architecture and geosciences-wide cyberinfrastructure developments. 2) EarthCube Building Blocks will provide value to the entire EarthCube enterprise by contributing to one or more of the following: a) Integration

of existing technology components to extend capabilities to a broader set of geoscientists than are currently served; b) Creation or modification of cyberinfrastructure to overcome barriers or inefficiencies as identified by the geosciences community in documents such as the geosciences domain workshop reports; and c) Introduction of modern or novel cyberinfrastructure into the geosciences that has the potential to transform cyberinfrastructure across all geosciences, and that is demonstrated with improvements for identified academic geosciences communities and their facilities. *Deadline: March 12, 2015.*

Generation Three (Gen-3) Engineering research Center (ERC) Program: The goal of the Generation Three (Gen-3) Engineering Research Centers (ERC) Program is to create a culture in engineering research and education that integrates discovery with technological innovation to advance technology and produce graduates who will be creative U.S. innovators in a globally competitive economy. These ERCs are at the forefront as the USA competes in the 21st century global economy where R&D resources and engineering talent are internationally distributed. Recognizing that optimizing efficiency and product quality are no longer sufficient for U.S. industry to remain competitive, these ERCs integrate transformational academic engineering research and education to stimulate increased U.S. innovation in a global context. The ERC education program is comprised of a university program and a pre-college program. The university education mission of an ERC is to prepare students for effective practice in industry and to enhance their capacity for creative and innovative leadership throughout their careers. The pre-college education mission rests on long-term partnerships with K-12 institutions to expose teachers to engineering and deliver engineering concepts and experiences to their classrooms to stimulate student interest in engineering careers. The interface of the research and the educational culture of the ERC enriches the participating universities through the transfer of ERC-generated knowledge into engineering curricula. *Sponsor ID: NSF 13-081, -560. Deadlines: Letter of Intent: May 30, 2014; Preliminary Proposal: July 30, 2014; Full Proposal: February 12, 2013.*

Ecology and Evolution of Infectious Diseases (EEID): The goal of the EEID program is to support important and innovative research on the ecological, evolutionary, and socio-ecological principles that influence the transmission dynamics of infectious diseases. The program's focus is on the discovery of general principles and processes and on building and testing models that elucidate these principles. Projects must address quantitative or computational understanding of pathogen transmission dynamics. Research in EEID is expected to be an interdisciplinary effort that goes beyond the scope of typical studies funded by the standing programs of the partner agencies. They should bring together such areas as anthropology, computational science, ecology, epidemiology, evolution, food science, genomics, geography, global health, mathematics, microbiology, plant science, population biology, sociology, physical environmental sciences, systems science, and veterinary medicine. The history of the EEID program has shown that the most competitive proposals are those that advance broad, conceptual knowledge that reaches beyond the specific system under study and that may be useful for understanding public, agricultural or ecosystem health, natural resource use and wildlife management, and/or economic development. *Deadline: November 20, 2014.*

Advancing Informal STEM Learning (AISL): The Advancing Informal STEM Learning (AISL) program seeks to advance new approaches to and evidence-based understanding of the design and development of STEM learning in informal environments for public and professional audiences; provide multiple pathways for broadening access to and engagement in STEM learning experiences; advance innovative research on and assessment of STEM learning in informal environments; and develop understandings of deeper learning by participants. Whether for personal satisfaction, professional advancement, or fulfilling learning requirements for pre-K through graduate and professional education, greater possibilities for accessing and understanding informal education are emerging through increased access to STEM learning anywhere and anytime. AISL's research and development investments focus on the translation of foundational and early stage research to research, design,

development, and implementation of STEM learning in informal environments. As such, the knowledge base to which AISL contributes most is more closely aligned with theories of practice and designed-based research than with foundational theory building. The program supports five types of projects: (1) Pathways, (2) Research in Service to Practice, (3) Innovations in Development, (4) Broad Implementation, and (5) Conferences, Symposia, and Workshops. *Deadline: November 14, 2014.*

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.

The Special Handling list was created in order to communicate donor restrictions and/or preferences for managing solicitation requests from Indiana University. The list reflects special relationships that exist between donors and the university and includes corporations and foundations that the President's office wishes to review prior to submission in order to coordinate Indiana University's requests to these donors.

The Special Handling List was compiled and is maintained by the Indiana University Foundation office of Corporate and Foundation Relations. Please contact [Dee Metaj](#) at 317-278-5644  if you have any questions regarding this list.

IU Authentication is required to view the following attachments:

[IUF Special Handling List and Principal Gifts Review Template](#)

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