

# Research Enterprise

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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## Editor:

Etta Ward

## Layout:

Fred Haver

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.

July 23, 2015

## INSIDE THIS ISSUE:

- [Feature Story](#)
- [Announcements](#)
- [Center Spotlight](#)
- [Faculty Spotlight](#)
- [Translational Research Impact](#)
- [OVCR Internal Grant Deadlines](#)
- [OVCR Events and Workshops](#)
- [Other Events and Workshops](#)
- [Current External Funding Opportunities](#)
- [Identifying Funding Opportunities](#)

## FEATURE STORY

### Center for Pancreatic Cancer Research earns IUPUI Signature Center designation

Accomplishments in the first three years of their collaboration to fight pancreatic cancer have earned the scientists at the Pancreatic Cancer Research Center designation as an IUPUI Signature Center.

Researchers predict that the disease, which takes 40,000 lives in the U.S. each year, will be the second-leading cause of cancer deaths in the U.S. within 15 years.



Dr. Murray Korc

In a multi-approach, multi-university effort headquartered at the Indiana University Melvin and Bren Simon Cancer Center on the Indiana University-Purdue University Indianapolis campus, about 50 research scientists have geared up to fight the deadly malignancy.

The Signature Center designation from the IUPUI Office of the Vice Chancellor for Research also recognizes the center's potential to sustain efforts the researchers hope will lead to increased survival rates and better quality of life among pancreatic cancer patients.

"This is a well-deserved recognition of a center that is making significant impact on the understanding and treatment of pancreatic cancer, and I am delighted that it is attracting national and international recognition for its work," said Kody Varahramyan, IUPUI vice chancellor for research.

The Pancreatic Cancer Signature Center is composed of multiple interdisciplinary partnerships among the team of basic, translational, and clinical researchers working at sites on the IU Bloomington, Purdue University, Notre Dame University, and IUPUI campuses.

The center's researchers are engaged across the continuum of disease research, from the biological/molecular investigation of pancreatic tumor development in the

laboratory stage, to pre-clinical trials with mouse models, to clinical trials pursuing improved therapies for pancreatic cancer patients.



Pancreatic Cancer Stats, Designer:  
Samantha Thompson

"Our center combines the strengths of senior investigators working on basic cancer mechanisms and potential therapeutic interventions, with the strengths of mid-level and junior faculty using novel technologies and collaborating with the senior investigators to further our overall understanding of pancreatic cancer genesis, progression, tumor microenvironment and metastasis, and coordinating these advances to devise novel diagnostic biomarkers and novel combinatorial therapeutic approaches," said Dr. Murray Korc, director of the Pancreatic Cancer Research Center, a researcher at the IU Simon Cancer Center, and the Myles Brand Professor of Cancer Research at IU School of Medicine.

Under the IUPUI Signature Center's Initiative Grant Program sponsored by the Office of the Vice Chancellor for Research, the Pancreatic Cancer Research Center received \$300,000 in seed money in 2011, which has paid for the infrastructure to support the multi-site collaborations and the mentoring program that pairs younger researchers with veteran scientists.

"The origination award has allowed us to forge collaborations," Korc said. "This Signature Center designation will encourage those collaborations to continue to flourish. We are working simultaneously on securing more grants to make us more sustainable in the long run."

Researchers at the Pancreatic Cancer Research Center leveraged the seed money from the origination award into an additional \$9.2 million in research grants during the past three years, according to Korc.

"Receiving the official Signature Center designation underscores our potential to continue team science in a sustainable and high-impact manner and helps us honor the memory of former IU President Myles Brand and philanthropist Mel Simon, both of whom succumbed to pancreatic cancer on September 16, 2009," Korc said.

Korc also thanked Dr. Pat Loehrer, the director of the IU Simon Cancer Center, and Mark Kelley, associate director of the Pancreatic Cancer Research Center, for coordinating the groundwork that led to the successful creation of the [Pancreatic Cancer Signature Center](#).

## ANNOUNCEMENTS



### Visiting NIH Program Officials Will Present Programs and Initiatives Supporting Women Researchers in the Health and Life Sciences and Beyond

When: Monday, September 21, 2015 | 1:00pm - 2:30pm

Where: University Library, 0130 Lilly Auditorium

Register: <https://crm.iu.edu/CRMEvents/NIHWomenResearchers092115/>

Jennifer Plank-Bazinet, Ph.D., and Reiko Toyama, Ph.D., both from the National Institutes of Health (NIH), will be discussing NIH programs that support the hiring, advancement, and retention of women in the academic and scientific workforce. Although this presentation is targeted to “women of color” (broadly defined) at all stages of their careers, it is also open to men and/or women who do not identify as women of color but are interested in supporting women of color in scientific/research careers, including graduate students.



Jennifer Plank-Bazinet,  
Ph.D.

Dr. Plank-Bazinet will provide an overview of programs supported by the Office of Research on Women’s Health, including the Research Supplements to Promote Re-Entry into Biomedical and Behavioral Research Careers and the Working Group on Women in Biomedical Careers. Special attention will be given to initiatives to support women of color.



Reiko Toyama, Ph.D.

Dr. Toyama will discuss her career trajectory and training and research programs supported by the *Eunice Kennedy Shriver* National Institute of Child Health and Development, including the Research Supplements to Promote Diversity in Health-related Research. She will talk about the intramural research opportunities at NIH.

### **Nominations Sought for New Innovation-To-Enterprise Award**

Know an outstanding faculty innovator or entrepreneur? The Office of the Vice Chancellor for Research (OVCR) is seeking nominations for the inaugural Innovation-To-Enterprise Award for faculty innovation. This award was created to recognize outstanding IUPUI researchers who have achieved significant accomplishments contributing to commercialization of their research, economic development, or social advancement. Each year one award of \$5,000 in cash will be given for a significant accomplishment by an individual or a group (if multiple individuals have made substantial contributions to the given accomplishment, the award will be divided equally between the individuals involved). Guidelines and eligibility details are available at the Innovation to Enterprise Awards website:

<http://research.iupui.edu/IEC/>

Deadline for applications is October 2, 2015. The winner(s) of the award will be recognized at the annual Innovation to Enterprise Forum and Showcase, scheduled for November 4, 2015. Please contact Karen White ([kfwhite@iupui.edu](mailto:kfwhite@iupui.edu)) for more information or with questions.

### **IUPUI will help U.S. State Department develop policy solutions through Diplomacy Lab**

The U.S. Department of State is turning to Indiana University-Purdue University Indianapolis and other university campuses to help it address a growing diplomatic to-do list.

The effort is part of the State Department’s Diplomacy Lab, a program in which faculty and students develop ideas and solutions to policy issues identified by the federal agency.

Launched by Secretary of State John Kerry in 2013, the Diplomacy Lab is seeking additional university partners. IUPUI’s application was recently approved.

“IUPUI’s participation in the Diplomacy Lab contributes to several strategic priorities, including goals for student



Gabe Filippelli, Ph.D.

success, innovation and discovery, and community engagement," said Nasser Paydar, executive vice chancellor and chief academic officer. "Students working in teams to address complex, real-world challenges under the guidance of faculty experts will experience deeper learning as they help solve world problems as well as promote much-needed academic diplomacy".

A senior State Department advisor said there was a simple reason the department turned to universities for help: "The State Department's diplomatic to-do list is getting bigger and bigger, but our team is not," said Tomicah Tillemann, who served from 2010 to 2014 as the senior advisor to the secretary for civil society and emerging democracies.

In the fall semester, one or more teams of IUPUI graduate students and students in their final year of undergraduate degrees will focus on State Department-assigned policy issues in a semester-long class led by faculty, said Gabriel Filippelli, a professor in the Department of Earth Sciences at IUPUI.

Filippelli led IUPUI's efforts to apply for the Diplomacy Lab partnership. He had served for a year in a science advisory position at the State Department after he was named a Jefferson Science Fellow in 2013.

Filippelli said the State Department has identified 44 policy issues that reflect the wide array of challenges it faces, including climate change, human rights, counterterrorism, legal and judicial reform, and women's issues.

Working with other faculty, Filippelli said IUPUI would identify specific issues it wants to study. The State Department will review IUPUI's request, along with those from other universities, and then assign the policy research work, matching the issues with the strengths and interests of the universities participating in the Diplomacy Lab.

Over the course of a semester, faculty will guide students in developing a final product that accomplishes the goals outlined by the State Department. Students will have opportunities throughout the semester to discuss their research with State Department officials.

## CENTER SPOTLIGHT

### **Research: A microRNA may provide therapy against pancreatic cancer**

Indiana University cancer researchers found that a particular microRNA may be a potent therapeutic agent against pancreatic cancer. The research was published June 22 in the journal *Scientific Reports*.

Led by Janaiah Kota, Ph.D., assistant professor of medical and molecular genetics at the IU School of Medicine and a researcher at the Indiana University Melvin and Bren Simon Cancer Center, the researchers found that restoring missing microRNA-29 (miR-29) in pancreatic cancer stromal cells reduced the viability and growth of the cancerous cells.

A thick fibrotic shell around the cancer cells is known as "stroma", which protects the pancreatic cancer cells from anticancer drugs such as chemotherapy.

"We found that the loss of miR-29 is a common phenomenon of pancreatic cancer stromal cells, and that by restoring it, the stromal accumulation and cancer growth was reduced," Dr. Kota said. "The use of miR-29 as a therapeutic agent may be more effective in targeting reactive stroma, as a single miRNA regulates the



Janaiah Kota, Ph.D.



expression of several genes associated with disease mechanisms.”

“In healthy cells and tissues, a single miRNA controls the expression of hundreds of genes, and any alterations in their normal expression leads to abnormal overexpression of bad genes that are favorable for the growth of cancer cells and are harmful to normal cells,” Dr. Kota explained.

Dr. Kota and his colleagues were studying the role of small non-coding RNAs called microRNAs in molecular mechanisms associated with pancreatic cancer stroma to evaluate their use for therapeutic intervention in pancreatic cancer. They found that there is loss of miR-29 in stroma of the pancreatic tumors compared to the healthy pancreas. The researchers expected its expression in stromal cells would restore normal function of stromal cells and reduce the abundance of fibrotic stromal proteins. However, they were surprised that when they co-cultured miR-29 overexpressing stromal cells with cancer cells, it also reduced the viability and growth of cancer cells for unknown factors.

They are currently performing additional studies to understand the molecular mechanisms associated with the effect of miR-29 overexpression in stromal cells on cancer cells as well as in preclinical animal models.

“This is a novel approach that has the potential to overcome the problems associated with current anti-stromal drugs and that could lead to improved therapeutic strategies, enhanced drug delivery to the tumor bed, and, in the future, improved patient survival,” said Dr. Korc, the Myles Brand Professor of Cancer Research at the IU School of Medicine and a researcher at the IU Simon Cancer Center. Dr. Korc is also director of the Pancreatic Cancer Signature Center.

The need for new therapies for pancreatic cancer patients is great as only seven percent of people with the disease survive more than five years after diagnosis. According to the National Cancer Institute, there will be an estimated 48,960 new cases of pancreatic cancer and 40,560 deaths from the disease in 2015.

The research was supported by the Elsa U. Pardee Foundation and the [Pancreatic Cancer Signature Center](#).

Other IU collaborators included Murray Korc, M.D.; Romil Saxena, M.D.; Grzegorz Nalepa, M.D., Ph.D.; Jesse Gore, Ph.D.; Zhangsheng Yu, Ph.D.; Zahi Abdul-Sater; Ravi Alluri Ph.D.; Smiti Sahu; Sarah Nabinger; and first author Jason Kwon, as well as Zachary Vega of Wabash College.

## FACULTY SPOTLIGHT

### **Lower risk treatment for blood clots "empowers" patients, improves care**

Potentially fatal blood clots account for thousands of emergency room visits each year, and often those patients are admitted to the hospital, treated with an injectable anticoagulant, and monitored for a few days. In companion studies published July 15 in *Academic Emergency Medicine*, an alternative approach was found to be more effective, less costly, and allowed patients to go home the same day.

Researchers at the [Indiana University School of Medicine](#) treated 106 low-risk patients diagnosed with deep vein thrombosis or pulmonary embolism at two metropolitan emergency rooms. The patients were admitted to the emergency room between March 2013 and April 2014. Seventy-one had deep vein thrombosis, 30 had pulmonary embolisms, and five had both diagnoses.

The standard of care is to admit the patient to the hospital, treat with heparin, an injectable anticoagulant, and oral warfarin, with close monitoring to assure safe

dosage levels to prevent additional blood clots or bleeding.

The patients in the study were treated with rivaroxaban, which does not require daily blood monitoring, and released to go home. The patients received follow-up monitoring at two and five weeks, and at three and six months. Heparin and warfarin require blood monitoring about every week. Warfarin also means the patient must carefully control their intake of vitamin K, which is found in green leafy vegetables.



Jeffrey A. Kline, M.D.

Senior author [Jeffrey A. Kline](#), M.D., vice chair of research in emergency medicine and professor of emergency medicine and cellular and integrative physiology at the Indiana University School of Medicine, said the prospect of being able to send patients home from the emergency room is a quality of life issue. In addition to avoiding a hospital stay, Dr. Kline and his team found that patients diagnosed with deep vein thrombosis who were immediately discharged from the emergency room and treated with rivaroxaban had a low rate of recurrent thrombosis and bleeding.

"This study is about giving patients a new option," Dr. Kline said. "Treating patients at home for blood clots was found to have fewer errors than the standard of care, and better outcomes. Patients have to be taught to give themselves injections and it scares them to death. Almost everyone has taken a pill so there is no learning curve for patients."

In the second study, Dr. Kline and colleagues compared costs associated with both treatment protocols and found that the rivaroxaban protocol resulted in about half the cost of hospitalization and treatment with heparin and warfarin. Patients were matched for age, sex, and severity of their illness. Ninety-seven cases were evaluated after six months, and the median cost for the rivaroxaban group was \$4,787, less than half the median cost of \$11,128 for the group that was hospitalized and treated with the current standard of care.

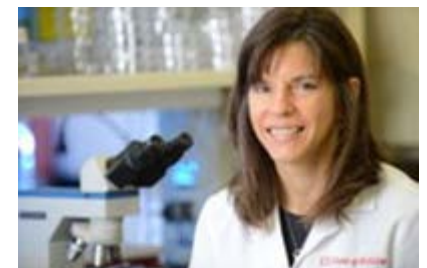
"We really do empower the patient more with this anticoagulant treatment," Dr. Kline said. "Patients say treatment with no injections is a much better option. This treatment for DVT or pulmonary embolisms takes a condition that is life-threatening and makes it something the patient can control."

First author Daren M. Beam, M.D., M.S., assistant professor of emergency medicine, and co-author Zachary P. Kahler, M.D., now at the Greenville (S.C.) Health System, worked with Dr. Kline on both studies.

## TRANSLATIONAL RESEARCH IMPACT

### **IU cancer researchers play role in FDA approval of drug for treating people after radiation exposure**

An [Indiana University Melvin and Bren Simon Cancer Center](#) researcher played a role in the recent Food and Drug Administration approval of a drug to treat people exposed to potentially lethal doses of radiation.



Christie M. Orschell, Ph.D.

[Christie M. Orschell](#), Ph.D., a senior research professor at the [Indiana University School of Medicine](#) and a researcher at the cancer center, and colleagues performed preclinical work that contributed to the approval of Neupogen (filgrastim) to treat adult and pediatric

patients exposed to myelosuppressive doses of radiation. Such exposure may happen in a radiation nuclear event.

Radiation destroys the bone marrow, resulting in loss of blood cells and increasing the risk of infection and uncontrolled bleeding, according to Dr. Orschell. Neupogen can help patients by facilitating recovery of bone marrow cells that develop into neutrophils, white blood cells that help fight off infections.

"The approval of Neupogen is an important step in advancing medical countermeasures for radiation," Dr. Orschell said. "Still, we're continually investigating new drugs that are easier to administer and perhaps only require a single injection."

Neupogen is the first radiation countermeasure approved under the FDA's Animal Rule, which was drafted to guide the development of drugs when human efficacy studies cannot ethically be performed. In March 2015, the FDA approved Neupogen for use following an acute exposure to a radiation dose capable of causing severe loss of bone marrow cells.

Dr. Orschell and her lab team of nine researchers developed a mouse model to test medical countermeasures against radiation as part of a consortium of investigators working together to find drugs to treat irradiated people. Data from the Orschell lab contributed to the understanding of how Neupogen may work in humans.

Dr. Orschell explained that a mouse model is used to mimic a disease in humans. "Our mouse model of acute radiation syndrome has become one of the standard models to test medical countermeasures under the Animal Rule," Dr. Orschell said.

In 2005, the National Institute of Allergy and Infectious Diseases awarded a federal contract to the University of Maryland School of Medicine, which established the consortium of institutions to facilitate the development of medical countermeasures that could be used in an emergency mass casualty situation involving radiation injuries. IU was an integral part of that consortium.

Dr. Orschell's ongoing work recently earned her \$750,000 in funding from the Department of Defense to study drugs for civilians or first responders who report to a site following radiation exposure. "In the case of first responders, you would have an opportunity to administer the drug to them before they are exposed at the site," she said.

## OVCR INTERNAL GRANT DEADLINES

### **Enhanced Mentoring Program with Opportunities for Ways to Excel in Research (EMPOWER):**

The Enhanced Mentoring Program with Opportunities for Ways to Excel in Research (EMPOWER) has been developed to support IUPUI faculty who are historically underrepresented and/or excluded populations in their discipline or area of scholarship and historically denied admission to higher education within that discipline to: 1) become successful in sponsored research and scholarly activity; and 2) achieve significant professional growth and advancement. The program sustains mentorship opportunities through the EMPOWER Grant Program, supporting achievement of excellence in research and scholarly activity, and optimal attainment of academic career goals and objectives. The next EMPOWER application deadline is **September 5**. For grant guidelines and application forms, go to <http://research.iupui.edu/funding/>.

### **Funding Opportunities for Research Commercialization and Economic Success (FORCES):**

The FORCES program is designed to support IUPUI researchers in the successful transformation of their research findings into commercially viable outcomes. The key

goals of FORCES are to support: 1) realization of short-term projects that will enhance commercial value of IUPUI intellectual property assets, by facilitating commercialization of inventions, technologies, or other intellectual property derived from existing research projects; and 2) development of research initiatives that show great promise for commercialization of the research outcomes. The next FORCES application deadline is **September 15**. For grant guidelines and application forms, go to <http://research.iupui.edu/funding/>.

## OVCR Events and Workshops

### OVCR Research Orientation

Target Audience: Faculty

When: Wednesday, August 26, 2015 | 1:00pm - 3:00pm

Where: University Library, Room 1126

This session will provide an overview of research resources, services, and support offered to IUPUI faculty by the Office of the Vice Chancellor for Research.

Participants will also meet with some current IUPUI faculty members to hear how they were able to achieve success in the early stages of their tenure at IUPUI.

Register: <https://crm.iu.edu/CRMEvents/OVCROrientation082615/>

### OVCR Research Orientation (*Repeat Session*)

Target Audience: Faculty

When: Friday, September 4, 2015 | 10:00am - 12:00pm

Where: University Library, Room 1126

This repeat session will again provide an overview of research resources, services, and support offered to IUPUI faculty by the Office of the Vice Chancellor for Research. Participants will also meet with some current IUPUI faculty members to hear how they were able to achieve success in the early stages of their tenure at IUPUI.

Register: <https://crm.iu.edu/CRMEvents/OVCROrientationRepeat090415/>

### Basic Proposal Writing

Target Audience: IUPUI and IUPUC Faculty

When: Wednesday, September 9, 2015 | 11:30am - 1:00pm

Where: University Library, Room 1126

This workshop will focus on the basic essentials of building a successful grant proposal for agencies that fund in the sciences, social sciences, arts, and humanities. A wide range of topics will be covered, including developing a strong foundation for your application, defining key components of the narrative and the basic budget, identifying writing styles, interpreting agency guidelines, demonstrating the necessity for knowing how your proposal will be reviewed; strategizing for funding limitations, and planning how to communicate complex ideas in a limited space.

Register: <https://crm.iu.edu/CRMEvents/BasicProposalWriting090915/>

### Finding Funding

Target Audience: Faculty, Staff, Graduate Students

When: Thursday, October 1, 2015 | 10:00am - 11:30am

Where: University Library, Room 0106

This session will provide an overview of the various types of external funding sources, identify tools to locate funding opportunities, explain how to design a funding search, and demonstrate a couple of knowledge management systems that contain



thousands of funding opportunities available by the university subscription. This session is hands-on in a computer lab.

Register: <https://crm.iu.edu/CRMEvents/FindingFunding100115/>

### **IUPUI Imaging Research Symposium**

Target Audience: Academic and industrial investigators interested in imaging research and its applications

When: Friday, October 2, 2015 | 1:00pm - 5:00pm

Where: University Library, Lilly Auditorium

The objective of this Symposium is to bring together investigators from diverse scientific disciplines with imaging technology experts to explore potential collaborative research opportunities.

More information and registration coming soon.

### **Developing Complex, Multi-Investigator, Multi-Institutional Proposals**

Target Audience: Senior Faculty with Previous or Current External Funding; Signature Center Directors

When: Tuesday, October 13, 2015 | 4:00pm - 5:30pm

Where: University Library, Room 1126

The current funding environment favors large, complex, multi-institutional, multi-investigator projects. However, organizing a successful submission takes a great deal of planning and teamwork. This session will focus on how to prepare a successful proposal and identifying what support is available from the Proposal Development Services professional proposal writers and editors in the Office of the Vice Chancellor for Research.

Register: <https://crm.iu.edu/CRMEvents/ComplexProposals101315/>

### **IUPUI Nanotechnology Research Forum and Poster Symposium**

Target Audience:

When: Friday, October 16, 2015 | 1:00pm - 5:00pm

Where: University Library, Lilly Auditorium

This Symposium brings together investigators from diverse scientific disciplines with nanotechnology expertise to present and explore potential collaborative research opportunities.

More information and registration coming soon.

### **Nine Golden Rules to Succeed in Research and Scholarship**

Target Audience: Faculty

When: Friday, October 23, 2015 | 11:00am - 1:00pm

Where: University Library, Room 1116

This session will reveal the Nine Golden Rules on how to succeed in research and scholarship. It is focused toward new and early career investigators; however, mid-career faculty should find information of interest as well.

Register: <https://crm.iu.edu/CRMEvents/NineGoldenRules102315/>

### **IUPUI Innovation Forum and Showcase - Alternatives for Funding New Ventures**

Target Audience: Faculty

When: Wednesday, November 4, 2015 | 1:00pm - 4:00pm

Where: Campus Center Theater

The Office of the Vice Chancellor for Research and the Indiana University Research &

Technology Corporation (IURTC) co-sponsors the IUPUI Innovation Forum and Showcase.

More information and registration coming soon.

Register: <https://crm.iu.edu/CRMEvents/OVCRORIENTATION082615/>

## OTHER EVENTS AND WORKSHOPS

### "Schweitzer and the USA: Philanthropy, Networks and Medicine in the 20th-Century"

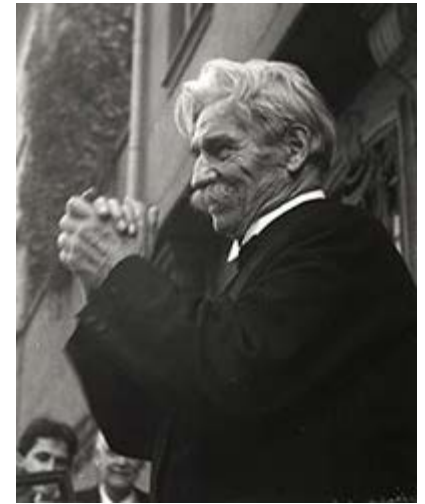
**Date and Time:** August 13, 2015-- 12 pm-1 pm

**Location:** IUPUI Arts & Humanities Institute, 4th floor of the IUPUI University Library, Room UL 4115P

755 W. Michigan St.

**Free Registration:** ([click here](#))

In 1949, the German-born Dr. Albert Schweitzer traveled to the United States. Famous for establishing a hospital in Lambaréné (Gabon) in the African rainforest, *Life* magazine had recently named him "The Greatest Man in the World." And, in just a few years, he would receive the Nobel Prize. This trip to the United States was vital to Schweitzer's larger project of building an international network of philanthropy that could sustain his work in Africa. Dr. Hines Mabika's talk will explore these transnational relationships and connections, revealing networks of individuals and institutions that included the Unitarian Church, prestigious universities, and pharmaceutical companies which provided him and his hospital with medicines.



Dr. Hines Mabika is Senior Research Associate of the Faculty of Medicine at Bern University, Switzerland. He has taught the history of medicine, colonial and postcolonial historiographies, and health network management. He holds a Ph.D. in history from the University of Aix-en-Provence, France, and an MBA in Health Network Management from Paul Cezanne University, France. He has served on the Faculties of Medicine at the University of Aix-Marseille, France, and the University of Lausanne, Switzerland, as well as the Faculty of Humanities at the University of Basel and University of Lausanne, Switzerland.

**Write winning grant proposals**  
Thursday, Sept 3 | 8:15 a.m. - 4:30 p.m. | Walther Hall (R3) Auditorium

**John D. Robertson, Ph.D.**  
Associate of Grant Writers'  
Seminars and Workshops, LLC

This seminar comprehensively addresses both conceptual and practical aspects associated with the grant-writing process. Idea development, identification of the most appropriate granting agency, how to write for reviewers, and tips and strategies that are of proven value in presenting an applicant's case to reviewers will

be explored.

[Register »](#)

## 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 below to search online tools.

### Defense Advanced Research Projects Agency (DARPA)

**Brandeis:** DARPA is soliciting innovative research proposals in the area of data privacy. Proposed research should investigate innovative approaches that enable revolutionary advances in privacy science or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

The Brandeis Program aims to enable individuals, enterprises, and U.S. government agencies to keep private and/or proprietary information private. Its purpose is to understand how to build information systems that can ensure that private data can only be used for its intended purpose and no other. The vision of the Brandeis program is to break the tension between (a) maintaining privacy, and (b) being able to tap into the huge value of data. Rather than having to balance between them, Brandeis aims to build a third option, that of enabling safe and predictable sharing of data in which privacy is preserved. Specifically, Brandeis will develop tools and techniques that enable us to build systems in which private data may be used only for its intended purpose and no other.

The potential for impact is dramatic. Assured data privacy can open the doors to personal medicine, effective smart cities, detailed global data, and fine-grained internet awareness. Without strong privacy controls, every one of these possibilities would face systematic opposition. *Deadline: April 29, 2016.* [DARPA-BAA-15-29: Brandeis](#)

### NATIONAL INSTITUTES OF HEALTH

**Innovative Research in Cancer Nanotechnology (U01):** This Funding Opportunity Announcement (FOA) invites applications for the development of innovative research projects in cancer nanotechnology. This initiative, to be known as Innovative Research in Cancer Nanotechnology (IRCN), is an integral component of a broader program, the NCI Alliance for Nanotechnology in Cancer. IRCN awards are designed to enable multi-disciplinary research and transformative discoveries in cancer biology and/or oncology through the use of nanotechnology. Proposed projects should address major barriers in cancer biology and/or oncology using nanotechnology, and each proposal should emphasize fundamental understanding of nanomaterial interactions with biological systems and/or mechanisms of their *in vivo* delivery. NCI will hold a pre-application informational webinar for this FOA. Date, time, and other details will be posted at <http://nano.cancer.gov/phase3info>. *Deadlines: October 5, 2015; April 14, 2016.* <http://grants.nih.gov/grants/guide/pa-files/PA-14-285.html>

**Cancer Research Education Grants—Research Experiences (R25):** The NIH Research Education Program (R25) supports research education activities in the mission areas of the NIH. The over-arching goal of this NCI R25 program is to support educational activities that complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral, and clinical research needs.

To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on Research Experiences. Applications are encouraged that propose innovative, state-of-the-art programs that address the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients, in accordance with the overall mission of the NCI. *Deadline: September 25, 2015.*

<http://grants.nih.gov/grants/guide/pa-files/PAR-15-152.html>

### **Core Infrastructure and Methodological Research for Cancer Epidemiology**

**Cohorts (U01)**: This announcement invites grant applications for targeted infrastructure support of the core functions of Cancer Epidemiology Cohorts (CECs) and methodological research. Through this vehicle, the National Cancer Institute (NCI) will support infrastructure and core functions for existing or new CECs. This FOA will also lead to support of core functions for CECs currently funded through other grant mechanisms by the Epidemiology and Genomics Research Program (EGRP) and other components of the Division of Cancer Control and Population Sciences (DCCPS) at the NCI. *Deadlines: November 10, 2015; March 11, 2016.*

<http://grants.nih.gov/grants/guide/pa-files/PAR-13-207.html>

## **NATIONAL SCIENCE FOUNDATION**

**Ecology and Evolution of Infectious Diseases (EEID)**: The goal of the EEID program is to support 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 as well as building and testing models that elucidate these principles. Projects must address quantitative or computational understanding of pathogen transmission dynamics. Research within EEID is expected to generate rigorously characterized and tested models that are of value to the scientific community, but also may be useful in decision making.

A variety of topics, questions, systems, and approaches are appropriate. Among the areas of particular interest are the role of social influences on the susceptibility of individuals or populations; multiway interactions between pathogenic and non-pathogenic organisms and their mutual hosts; the role of medical, agricultural or environmental practices on pathogen emergence and transmission; emergence of pathogens from non-pathogenic populations; host switching; evolutionary dynamics in an ecological context such as disease control interventions; and drug resistance.

*Deadline: November 19, 2015.* [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5269](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5269)

**NSF/Intel Partnership on Visual and Experiential Computing (VEC)**: Proposals responsive to this solicitation should seek to improve core capabilities in this emerging field and make advances to relevant areas. Suggested focus areas include, but are not limited to, the following:

**Computational Photography**: Advances in imaging technology and computation that will enable new modes of visual data capture and new processing features.

**Simultaneous Localization and Mapping (SLAM)**: New approaches to real-time, visual-based localization and mapping of large-scale environments for indoor and outdoor autonomous navigation under any lighting conditions and accounting for dynamic scenes with articulated and non-rigid objects. **Augmented Reality**: Photo-realistic virtual content insertion into real scenes and the application of this rendering to mobile and wearable platforms. Of particular interest is high-fidelity global illumination, accurate registration of the virtual content, and convincing physics-based modeling, all with lower power. **Image and Video Understanding**: With the explosion of visual data, the detection of salient content in video clips or imagery is growing in importance for various uses. These include video indexing, summarization, new methods for large-scale face, object and activity recognition, large vocabulary gesture recognition, and the integration of multiple sensing modalities.

**3D Scene Understanding**: Parse reconstructed 3D scenes derived from visual

imagery to enable dense category labeling of 3D points, extrapolation of occluded parts of the scene, photorealistic object removal, and the recovery and reasoning about functional properties of objects in the scene. This effort may include the collection and utilization of novel annotated data sets. *Deadline: February 26, 2016.* [NSF/Intel Partnership on Visual and Experiential Computing \(VEC\)](#)

### **Decision Frameworks for Multi-Hazard Resilient and Sustainable Buildings (RSB):**

Recent advances in graphene, a single sheet of carbon atoms arranged in a two-dimensional (2D) honeycomb crystal lattice, have raised tantalizing questions for other examples of 2D materials which might have distinct and useful properties. Such possibilities have opened our eyes to an entire world of 2D crystals. Examples of 2D-layered materials include hexagonal boron nitride (h-BN), transition metal dichalcogenides, the chalcogenides of group III, group IV and group V, transition metal oxides, tertiary compounds of carbo-nitrides, and other traditionally non-layered structures such as germananes (atomic layers of germanium) and silicenes (silicon-based layered structures).

Given the wide range of compositions of 2D-layered materials beyond graphene, it is not surprising that they offer a rich spectrum of properties. The rich variety of properties that 2D-layered material systems offer can potentially be engineered on demand, and they create exciting prospects for device and technological applications, such as in electronics, sensing, photonics, flexible electronics, energy harvesting and storage, thermal management, mechanical structures, catalysis, separation, bio-engineering, and gas adsorption in the future.

Reports exist of non-graphene 2D atomic layers integrated into devices which exhibit exceptional performance; for example, transistors derived from 2D monolayers of MoS<sub>2</sub> show ON/OFF ratios many orders of magnitude higher than the best graphene transistors at room temperature, with comparable mobilities. Other successful applications reported include enhanced thermal storage, thermoelectric performance, and gas adsorption with heterogeneous 2D material systems. A variety of studies on the synthesis, chemical modification methods, device fabrication and testing, and theoretical exploration of structure-property correlations, have been proposed on stable 2D atomic layered materials systems, and the field is about to see a significant explosion of activities in the near future. *Deadlines: Letter of Intent: November 7, 2015; Preliminary Proposal: January 9, 2016; Full Proposal: March 30, 2016.* [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13708](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13708)

## **U.S. DEPARTMENT OF DEFENSE (DOD)**

**Multidisciplinary Research Program of the University Research Initiative—Realistic Dynamic Formalism for Advanced Cyber Interaction:** The objective of this program is to investigate and develop fundamental theories and science required for understanding of adversarial cyber interactions, including realistic and computationally-viable formulations and characterizations.

Research Concentration Area: Novel approaches for the development of scientific and fundamental methods for analyzing and understanding adversarial cyber interactions. This objective may be accomplished by (a) developing entirely new formulations, or (b) enhancing existing theories and models, such as game theory or bi-level optimization. Some important technical issues to be addressed include (a) explicit representation and parameterization of all assumptions of the model and the associated environment, including time and a measure of change in the environment; and (b) practical and actionable level of abstraction. Areas of research focus include, but are not limited to, (1) rigorous and realistic dynamic cyber-adversarial models; (2) methods, metrics, and reference parameters for evaluating the validity of the model; (3) methods to formulate transient behavior and capture transient states; (4) principles for composing multiple sequential and/or parallel



cyber-adversarial interactions at different abstractions and time scales; (5) analytical techniques for reasoning about uncertainty in cyber-adversarial interactions, including the propagation of uncertainty arising from composition of adversarial and environmental models; and (6) methodologies for verifying that the time-varying defense strategies satisfies the required performance and security properties.

*Deadlines: White paper: Sept. 8, 2015; Application: December 7, 2015.*

<http://www.grants.gov/web/grants/view-opportunity.html?oppld=277226>

**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](mailto: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](mailto: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, Advanced Research Projects Agency-Energy, or 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. [ARPA-E Funding Opportunity Announcements](#)*

## 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](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](mailto: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](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.

Office of the Vice Chancellor for Research - [ovcr@iupui.edu](mailto:ovcr@iupui.edu)  
Indiana University Purdue University Indianapolis  
755 West Michigan Street, UL1140, Indianapolis, IN 46202-2896  
Phone: (317) 278-8427

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