

Four new Gillings Innovation Labs awarded

February 25, 2016

Four teams of researchers at the UNC Gillings School of Global Public Health have been awarded new funding for [Gillings Innovation Labs](#) (GILs), beginning this spring.



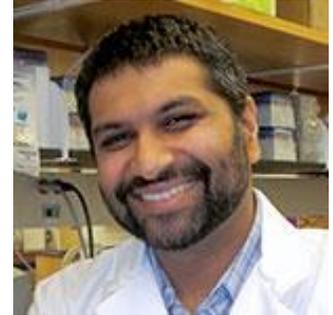
Dr. Jamie Bartram



Dr. Stephen Cole



Dr. Michael Hudgens



Dr. P. Sethupathy



Dr. Mark Sobsey



Dr. Miroslav Styblo



Dr. Deborah Tate



Dr. Carmina Valle

Team leaders are:

- **Stephen R. Cole, PhD**, professor of epidemiology, and **Michael G. Hudgens, PhD**, professor of biostatistics, for a project to improve population health data;
- **Mark Sobsey, PhD**, Kenan Distinguished Professor of environmental sciences and engineering and director of the Gillings School's Environmental Microbiology Laboratory, and **Jamie Bartram, PhD**, Don and Jennifer Holzworth Distinguished Professor of environmental sciences and engineering and director of The Water Institute at UNC, housed at the Gillings School, for a project to enhance removal of viruses and other contaminants from drinking water;
- **Miroslav Styblo, PhD**, professor of nutrition, and **Praveen Sethupathy, PhD**, assistant professor of genetics in the UNC School of Medicine, for research that will facilitate diagnosis and treatment of arsenic-associated diabetes by identifying circulating microRNAs that are specific for the disease and its underlying mechanisms; and
- **Deborah F. Tate, PhD**, professor of health behavior and of nutrition, and **Carmina G. Valle, PhD**, research assistant professor of health behavior, for a project that aims to construct and evaluate individualized interventions that address preventable public health problems, including obesity.

The GIL awards offer faculty members support to advance their innovative research and more quickly translate scientific findings into workable solutions in local and global communities. The awards are administered by

Research and Innovation Solutions, the Gillings School unit that manages a portion of the \$50 million gift to the UNC public health school from Dennis Gillings and Joan Gillings.

This fifth round of awards brings to 26 the number of research projects that have received GILs funding.

School leaders used a rigorous but rapid turnaround process to solicit proposals from Gillings School faculty in one of six high-priority areas, including implementation/improvement science, connected health (including mHealth), healthy aging, population health, big data and health, and new public health methodologies.

“In the past, we have shown that we can accelerate solutions through a rapid solicitation and funding process,” said **Barbara K. Rimer, DrPH**, Gillings School dean and Alumni Distinguished Professor. “Through the generosity of the Gillings gift, we can solve problems faster than through traditional grant solicitations processes.”

A pool of 75 highly qualified reviewers in the United States and abroad examined the 23 proposals and selected those deemed most likely to solve problems in areas that would advance improvements in the public’s health. A committee of the Gillings School’s chairs and other leaders discussed the reviewers’ recommendations and selected four for funding.

“These four projects represent some of the most ambitious and creative research ideas at the Gillings School,” said **Julie MacMillan, MPH**, managing director of Research and Innovation Solutions. “Expert reviewers and School leaders were struck by the teams’ winning combinations of innovative thinking and top-notch scientific rigor. We can hardly wait to see what they discover.”

As indicated in their comments below, reviewers agreed with MacMillan that the level of innovation in the selected projects was especially remarkable and that the selected initiatives likely would have significant impact.

Drs. Stephen Cole and Michael Hudgens

Causal Inference Research Laboratory

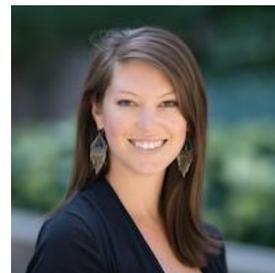
Cole and Hudgens will work with team members **M. Alan Brookhart, PhD**, and **Daniel Westreich, PhD**, associate professors of epidemiology, and **Stephanie Wheeler, PhD**, assistant professor of health policy and management, to address two significant topics in biostatistics and epidemiology, namely, “big data” analysis and causal inference.



Dr. Brookhart



Dr. Westreich



Dr. Wheeler

“Big data” refers to data sets so large or complex that traditional data processing applications are inadequate. Causal inference is the process of drawing a conclusion about a causal connection based on the conditions under which an effect occurs. Causal inference methods are needed to understand the information contained in big data sets, especially those obtained through observational research.

“The increasing availability of big data necessitates the development of new methods, so I find this proposal highly innovative,” one reviewer said. “The application of the methods to two important diseases – HIV and renal disease – also is appropriate and innovative.”

Andrew Olshan, PhD, Barbara Sorenson Hulka Professor of Cancer Epidemiology and chair of the epidemiology department, said he was thrilled that Cole and Hudgens received the award.

“Their work on causal inference has been groundbreaking and has provided foundational methods to make valid causal assessment of public health and biomedical data, thereby providing sound evidence to inform interventions and policy decisions,” Olshan said. “The award will allow the acceleration of new methods and tools. The partnership with the Department of Biostatistics has been critical to the success of this work.”

Drs. Mark Sobsey and Jamie Bartram

Transformative Use of Chitosan as a Coagulant-Flocculent and Filter Aid to Improve Drinking Water

Sobsey and Bartram will work with **Don Holzworth, MS**, Gillings Executive in Residence and board member of Aquagenx, a water-testing technology company, and **Lydia Abebe, PhD**, a Carolina Postdoctoral Program for Faculty Diversity fellow with expertise in household water treatment technologies. Abebe was instrumental in developing the proposal and will serve as a project leader.



Dr. Abebe



Don Holzworth

The team aims to develop a new and improved water treatment technology to overcome waterborne viruses including rotaviruses, noroviruses and Hepatitis E and A viruses, all of which can lead to diarrhea, liver disease and death. Chitosan, a naturally derived, inexpensive, biodegradable, nontoxic polysaccharide, will be used as a novel coagulant for drinking water treatment. Coagulation of the viral, bacterial, organic and other materials in the water results in the settling of large particles and the cleaning of surrounding water.

“The proposed work has a high likelihood of public health impact,” one reviewer wrote, noting that the investigators already had tested the technology and developed a commercialization strategy. Another reviewer

called the project “compelling” as chitosan is abundant and available globally. “If chitosan effectively can remove viruses, it substantially could improve existing water treatment devices in low-resource areas.”

Drs. Mirek Styblo and Praveen Sethupathy

Circulating MicroRNAs as Novel Biomarkers of Arsenic Associated Diabetes

Styblo and Sethupathy will work with a diverse team of investigators including **Michelle Mendez, PhD**, assistant professor of nutrition; **Rebecca Fry, PhD**, associate professor of environmental sciences and engineering; **John Buse, MD, PhD**, professor of medicine in the UNC School of Medicine and director of the N.C. Translational and Clinical Sciences (NCTraCS) Institute; **Luz Del Razo, PhD**, professor of toxicology in Centro de Investigacion y de Estudios Avanzados del Institute Politecnico Nacional, in Mexico; **Gonzalo Garcia-Vargas, MD**, professor of medical toxicology in Universidad Juarez del Estado de Durango, in Mexico; and **Madelyn Huang**, doctoral student in toxicology at UNC.



Dr. R. Fry



Dr. M. Mendez

Reviewers called the project proposal “unique” and “cutting-edge.”

“The proposed studies represent the first steps toward developing a clinically useful tool,” they said, “and the experiments are well-conceived and comprehensive. The research has the potential to provide valuable information concerning which specific microRNAs could be used to characterize inorganic arsenic-associated diabetes – information that could be quite useful in providing effective treatment strategies for diabetes associated with arsenic exposure.”

“This is a very exciting project,” said **Elizabeth Mayer-Davis, PhD**, professor and chair of the Gillings School’s nutrition department and renowned diabetes researcher. “It is an example of how new methods of precision medicine can be applied in the context of public health, which is an approach that eventually will be possible for many population health applications. Here, the problem of population exposure to arsenic as a unique cause of diabetes can be studied in a way that can lead to treatment that is highly targeted to the specific biological pathways that have been harmed by arsenic, thus allowing the patient to receive optimal care.”

Drs. Deborah Tate and Carmina Valle

Precision Public Health: Enhancing Connections to Develop Just-in-Time Adaptive Intervention Strategies

Tate and Valle will work with **Anne Cabell, MPH**, administrative director of UNC’s Communication for Health Applications and Interventions (CHAI) Core, a National Institutes of Health-funded shared resource, and **Eric Hekler, PhD**, a clinical psychologist at Arizona State University.

The researchers note that 40 percent of deaths from the five leading causes in the U.S. are preventable through behavioral changes. They see connected and eHealth interventions as feasible, effective and scalable solutions for weight loss and increased physical activity. New eHealth measures, called just-in-time adaptive interventions, take individualization to a new level, varying the timing, amount and content of the intervention to meet unique needs.

The project aims to support successful weight control in a targeted population of healthy-weight, overweight and obese young adults. Reviewers agreed that the project had high potential for public health impact if successful in this specific population.

“We are so proud of the work that Deb Tate and Carmina Valle do in designing, implementing and testing technology-based interventions,” said **Leslie Lytle, PhD**, professor and chair of health behavior at the Gillings School. “This Gillings Innovation Lab award will allow them to explore how just-in-time adaptive interventions can be used within an mHealth application to help young adults lose weight. Working with mobile health experts, computer scientists and journalists makes this a highly innovative approach.”

Dean Barbara K. Rimer said she was grateful to MacMillan and to **Sandra L. Martin, PhD**, professor and associate chair of maternal and child health and associate dean for research at the Gillings School, for managing the process of soliciting, reviewing and awarding the latest round of Gillings Innovation Laboratories.

“From efforts to develop new methods in epidemiology and biostatistics to creating tools to design individualized interventions to prevent disease (the public health side of precision medicine) to removing viruses from water and finding diabetes cases caused by arsenic, we are making the world healthier and safer,” Rimer said. “Thanks to the Gillings Gift, we are able to fund the most innovative, problem-solving proposals from our faculty members.”