

EMERGING CHALLENGES IN BIOMEDICAL RESEARCH AWARDS (ECBR)

Spring 2016 Awards

The inaugural ECBR awards went to three teams working on the Zika virus. Each award is for \$50,000 for one year. The intent of the awards is to support innovative, early stage research relevant to the priorities set by the NIH.

- 1) **Juan Song, PhD**, Assistant Professor of Pharmacology, and **Helen Lazear, PhD**, Assistant Professor of Microbiology and Immunology. The overall goal is to establish a tractable experimental model system to investigate the impact of ZIKV in the adult brain, thereby providing a foundation for future mechanistic studies and a platform for testing potential therapeutic compounds *in vivo*. They will test the overall hypothesis that ZIKV targets adult neural stem and progenitor cells and impacts development of newborn progeny in the adult hippocampus. Because the adult hippocampus is a neural substrate for many forms of learning and memory, plus a site of pathophysiology associated with various brain disorders, answers to this question will provide an entry point to address whether ZIKV infection can lead to long-term functional sequelae in people who did not exhibit acute neurological symptoms at the moment of ZIKV infection.
- 2) **Elizabeth Stringer, MD**, Associate Professor of OB/GYN; **Aravinda de Silva, PhD**, Professor of Microbiology and Immunology; **Jeff Stringer, MD**, Professor of OB/GYN; **Matt Collins, MD, PhD**, Infectious Diseases Fellow; and **Helen Lazear, PhD**, Assistant Professor of Microbiology and Immunology. This is a collaborative project with investigators in Colombia, where dengue virus is endemic and which is experiencing an ongoing ZIKV epidemic. The first aim is to expand an existing cohort of pregnant women who experience acute illness during pregnancy. With a combination of the natural history of the ZIKV infection during pregnancy and a variety of blood samples, the mother's flavivirus infection history, rates of ZIKV seroconversion, timing of infection during pregnancy, and risk for fetal infection will be determined. The second aim is to evaluate flavivirus humoral immunity in mothers and its impact on disease.
- 3) **Sylvia Becker-Dreps, MD, MPH**, Assistant Professor of Family Medicine; **Myron Cohen, MD**, Associate Vice Chancellor for Global Health and the Yeagan-Bate Distinguished Professor of Medicine, Microbiology & Immunology, and Epidemiology, Director of the Institute for Global Health & Infectious Diseases; and **Filemon Bucardo**, University of Nicaragua-Leon. To better understand the transmission of ZIKV, the investigators propose to characterize the epidemiology of ZIKV as it emerges in a ZIKV-naive population in Leon, Nicaragua, via a cohort study of patients presenting to the city's public hospital with fever, rash and/or conjunctivitis. Patient histories and samples will be collected to assess duration of shedding in various body compartments and assess the potential for sexual transmission of ZIKV. Next generation sequencing (NGS) will be employed to determine if ZIKV isolates in the genital tract are replicating independently or contain quasispecies not found in the blood. NGS will also be applied to samples from household members, including sexual partners of index cases, to evaluate phylogenetic relationships between ZIKV strains transmitted by mosquito compared to those possibly transmitted through sexual contact.