



2019 MP3 Seed Grant Awards

EMORY UNIVERSITY

Project Title: *The sum of the parts: Understanding the interaction between individual and population immunity to dengue, viral diversity, and transmission dynamics.*

Research Team

Matthew Collins, MD, PhD (PI; Asst Professor; SOM)

Anne Piantadosi, MD, PhD (Asst Professor; SOM)

Gonzalo Vazquez-Prokopec, PhD (Assoc Professor; ECAS)

Award Total: \$250,000 over 2 years.

Abstract

This project leverages existing and newly generated data on virus, vector, and host in the frame of Ecological Immunology to comprehensively define dengue virus transmission dynamics. Viruses circulating in mosquito and humans over the time span of a decade will be characterized by next generation sequencing and phylogenetics. Simultaneously, neutralizing antibody responses will be defined at individual and population levels. Results will be integrated with existing epidemiologic data to generate a dengue susceptibility map that predicts novel strain introduction. The model will be validated by historical and prospective dengue surveillance, providing an invaluable tool for high priority public health activities.

Project Title: *Microbiome organisms and natural immunity against pneumococcal disease.*

Research Team

Cynthia G. Whitney, MD (Professor, RSPH)

Nadine Rouphael, MD (Assoc. Professor, SOM)

Jesse J. Waggoner, MD (Asst. Professor SOM)

Award Total: \$250,000 over 2 years.

Abstract

Pneumococcal disease is a leading cause of illness and death, especially among the elderly in all countries and young children in low-income settings. How humans develop natural immunity to the range of pneumococcal serotypes is unknown. We plan to evaluate whether the presence of encapsulated Streptococcal bacteria that are part of the upper respiratory tract microbiome is associated with antibodies that could protect against invasive pneumococcal strains. If so, these commensal organisms could boost vaccine-induced or natural immunity in highly vulnerable populations, such as those in sub-Saharan Africa, where pneumococcal disease is not well controlled in spite of immunization programs.