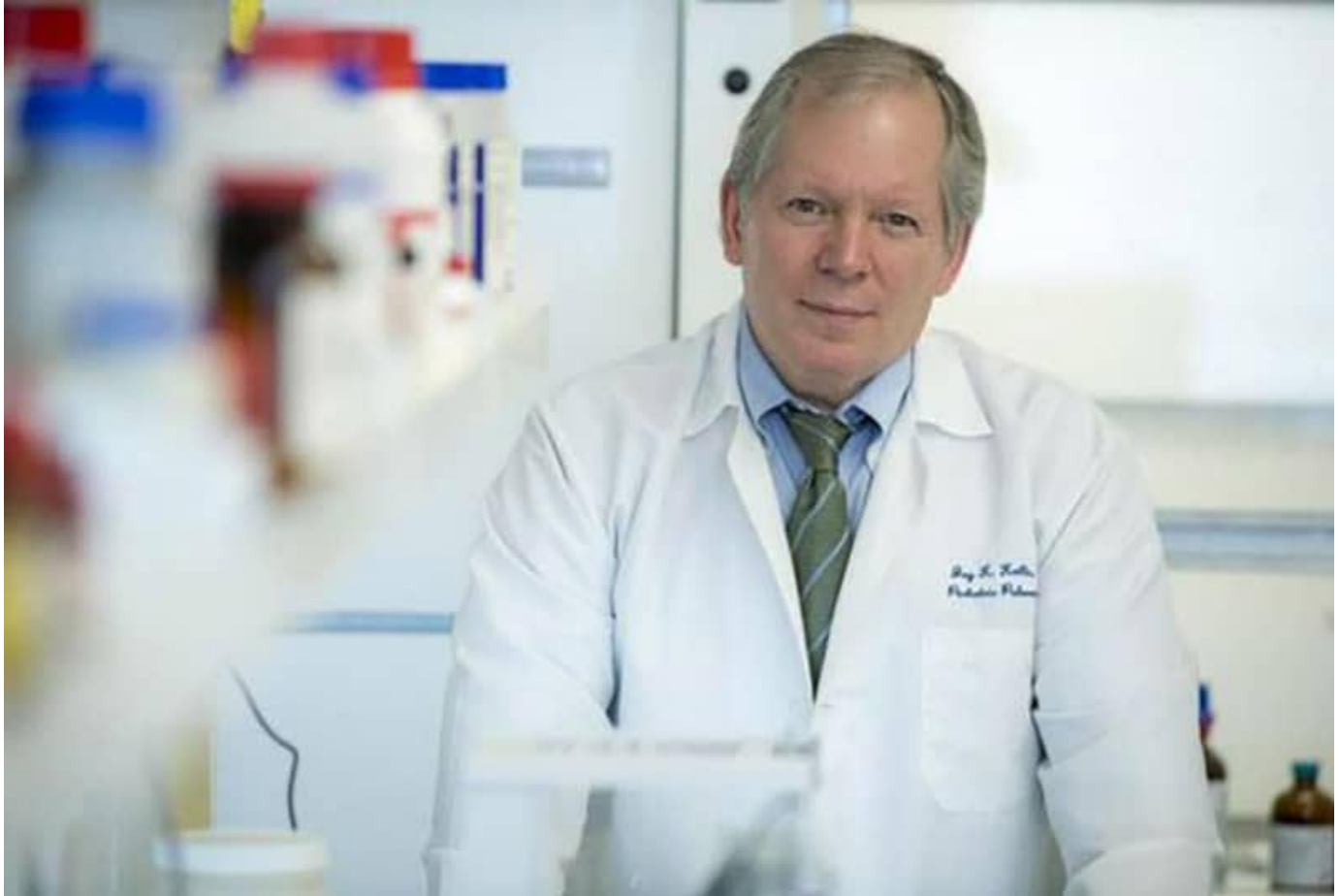


## **Dr. Jay Kolls Receives Awards for Proposals on Pulmonary Infection**

Jay Kolls, PhD



**Dr. Jay Kolls has recently received awards for two proposals targeting pulmonary infection.**

### **Immunology of COVID-19**

Using a mouse model of SARS-CoV2 infection we are assessing the role of gene modifiers CXCR6 as well as IL-21R signaling in the host immune response to SARS-CoV2. We are testing the efficacy of a mutant ACE2-IgG1 fusion protein has prophylaxis or therapy for COVID-19.

### **Immunotherapy against multi-drug resistant K. pneumoniae infections.**

Carbapenemase producing staining of K pneumoniae (Kpc) are a serious threat to

human health particularly in those individuals with underlying diseases such as transplant recipients. We have developed a transplant related model of Kpc infection and using single cell RNASeq to define mechanisms of which calcineurin inhibition, a mainstay of managing transplant rejection inhibits lung immunity against Kpc. With this knowledge we are testing novel host-based immunotherapy to treat these opportunity infections.

**These 2 new awards are in addition to 3 ongoing infection-focused pulmonary research grants in Dr. Kolls lab.**

### **CD4+ T-cell Immunity in the Lung**

Pneumonia remains the #1 killer of children in the world and is a leading cause of morbidity and mortality in children in the US and the #8 cause of mortality in adults. The research under this R35 investigate CD4+ T cell immunity in the lung and to harness these cells to improve lung resilience against pneumonia.

### **Improved Therapeutics and Diagnostics for Pneumocystis Pneumonia**

This project identifies novel targets to improve treatment outcomes as well as improve diagnostics for PCP particularly in resource poor settings where bronchoscopy may not be available.

### **Pathogen Immunity in Cystic Fibrosis**

CF is characterized by chronic lung infections. How these impact lung function is determined in part on host immunity. This has been best borne out by assessing host genetics- called gene modifiers which revealed that MHC Class II- the molecule that primes CD4+ T cells. Working with CFPT we have identified a cohort of long term non-progressors and characterize their immune response to P. aeruginosa. Additionally we are validating our human studies in a CF mouse model. Lastly we are studying how S. aureus and P. aeruginosa evade the immune response in CF to persist for decades in the CF lung and sinus.