

LA JOLLA INSTITUTE FOR IMMUNOLOGY

Novel Coronavirus/COVID-19 Research Funding Opportunities for Jewish Community Foundation San Diego Donors

March 27, 2020

COVID-19 Research at La Jolla Institute for Immunology (LJI)

As the COVID-19 pandemic continues to soar around the globe, it is starting to resemble the once-in-a-century outbreak experts have been warning about. While the main focus is to save lives now, we also need to look beyond the immediate crisis to improve the way we respond to outbreaks in the future. **La Jolla Institute** has a long history of working to understand and control infectious disease, and hopes to capitalize on the existing infrastructure and expertise with a laser focus on curbing the devastating impact of COVID-19 and preparing for future viral threats, which are sure to come.

There is an urgent need to quickly develop vaccines and therapeutics against COVID-19. One approach is to develop antibody therapies, which are often the first therapies advanced for an emerging infectious disease as they can treat those who have already become sick as well as protect frontline healthcare workers.

Dr. Erica Ollmann Saphire, Professor in LJI's Center for Infectious Disease and Vaccine Research, has been tapped by the **Bill and Melinda Gates Foundation** to establish a Coronavirus Immunotherapy Consortium (CoVIC) that will serve as a global clearinghouse to identify the most effective antibodies against the novel coronavirus and accelerate the development of therapies.

Additional philanthropic opportunities remain for individuals and foundations who would like to play an immediate role in the development of therapies to fight COVID-19. There are also opportunities to contribute to strategic infrastructure investment that would not only help COVID-19 research efforts but also ensure we are prepared for future pandemics.

We respectfully present these funding opportunities to donors of **Jewish Community Foundation San Diego Donors** and would be honored to present more detailed information as requested.

Antibody Discovery Immediate Funding Needs:

Replacement Nano Cab

Dr. Sapphire built a state-of-the-art cryo-electron microscopy and antibody discovery facility at LJL to reveal which parts of SARS-CoV-2 can be targeted to inspire immune defense or new drugs. She also directs the global Coronavirus Immunotherapy Consortium (CoVIC). CoVIC's structural biology pipeline depends upon a critical microscope chokepoint: the "nano cab" where cassettes are loaded. If this chokepoint fails, as it frequently does, the facility is shut until a replacement can arrive. During COVID-19, that could mean a delay of several months.

Cost: \$ 28,000

Computer Workstations

Dr. Sapphire's team is currently hobbled by a lack of computational resources. This bottleneck will get more and more significant as soon as the Krios powers on and produces a flood of data. Increasing the capacity to analyze data for the cryoEM pipeline will accelerate the lab's COVID-19 research, as well as provide resources to respond on the next pandemic.

Cost: \$ 23,000

Strategic Infrastructure Investment Needs to Prepare for Future Pandemics:

Establishing a fully outfitted Biosafety Level-3 (BSL-3) Facility

The upgrade of the Institute's existing BSL-2 facility to meet BSL-3 standards is almost complete. We don't have dedicated instrumentation in the suite because all work to date was BSL-2. With COVID-19 research now, and more anticipated BSL-3-level research in the future, we need dedicated instrumentation within the suite; both to isolate dangerous pathogens and to distinguish LJL further as leaders in the emerging infectious disease research. Needed are several instruments that would be shared resources:

Cytek Aurora Cytometer: \$450,000

RT-PCR / Centrifuge / Cell Assay Instruments: \$150,000

Sample Cryopreservation: \$75,000

Human Sample / Model Animal Special Handling Equipment: \$50,000

Assay Preparation Instrumentation: \$25,000

Total: \$ 750,000

Mass Spectrometer

In the short term, the acquisition of a mass spectrometer would advance our research into COVID-19 by allowing us to identify human proteins with which SARS-CoV-2 interacts. Knowing the molecular touchpoints where the virus and the human host intersect provides the mechanistic foundation for the development of broad-spectrum drugs and feeds the structural biology pipeline of the Sapphire lab. It could also identify and map HLA peptides to feed into the Immune Epitope Database (IEDB), which is run by Drs. Alessandro Sette and Bjoern Peters. In the long run, a mass spectrometer would lift multiple labs and projects across the institute by providing an essential proteomics tool.

Cost: \$ 1.5 Million

Erica Ollmann Saphire, Ph.D.

Professor, La Jolla Institute for Immunology, Center for Infectious Disease and Vaccine Research

Dr. Erica Ollmann Saphire is renowned for her leadership in guiding the development of antibody drugs and galvanizing a global research coalition (the Viral Hemorrhagic Fever Immunotherapy Consortium, est. 2014) that helped define which therapeutic antibodies effectively combat disease in humans infected with Ebola virus.

Dr. Saphire is the recipient of numerous accolades and grants, including the Presidential Early Career Award in Science and Engineering presented by President Obama at the White House; the Gallo Award for Scientific Excellence and Leadership from the Global Virus Network; young investigator awards from the International Congress of Antiviral Research, the American Society for Microbiology, American Society for Biochemistry and Molecular Biology, and the MRC Centre for Virus Research in the United Kingdom; the Investigators in the Pathogenesis of Infectious Disease Award from the Burroughs Wellcome Fund, and the Surhain Sidhu award for the most outstanding contribution to the field of diffraction by a person within five years of the Ph.D. Dr. Saphire has been awarded a Fulbright Global Scholar fellowship from the United States Department of State and a Mercator Fellowship from the German research foundation, Deutsche Forschungsgemeinschaft, to develop international collaborations around human health and molecular imaging through cryoelectron microscopy.

Dr. Saphire received a B.A. in biochemistry and cell biology and ecology and evolutionary biology from Rice University in Houston, Texas, and a Ph.D. in molecular biology from Scripps Research.

La Jolla Institute for Immunology

The La Jolla Institute for Immunology is dedicated to understanding the intricacies and power of the immune system so that we may apply that knowledge to promote human health and prevent a wide range of diseases. Since its founding in 1988 as an independent, nonprofit research organization, the Institute has made numerous advances leading toward its goal: life without disease. For more information: www.lji.org

LJI is a 501(c)3 tax-exempt organization. Federal Tax ID number 33-0328688

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