Projects

Molecular mechanisms of RNA virus replication [1]

We examine at a molecular level the mechanisms of virus replication, such as virus protein synthesis, genome replication, and viral particle formation and their interplay with cellular processes.

RNAi and its function as an antiviral defense mechanism [2]

We study the host strategies that control virus infection, including innate immune responses, such as RNAi and the mechanisms that the virus has evolved to suppress the host antiviral responses.

Virus population dynamics and evolution [3]

Third, in a unique combination between experimental and computational techniques, we are developing novel and exciting approaches to study virus population dynamics and evolution at the molecular and genomic level. We aim to elucidate the consequences of these evolutionary strategies for viral pathogenesis and the epidemiology of viral diseases. Understanding the mechanisms of virus evolution is essential to both development of antiviral therapies and vaccine design.

Enterovirus Therapeutic Interfering Particles (eTIPs) [4]

We use the lab’s expertise in basic and cutting-edge virology techniques to understand the replication and therapeutic effects of eTIPs, which are engineered genomes of enteroviruses that lack key genes for replication. In cell culture and animal models we find these genomes to have inhibitory effects on wild-type RNA virus replication and pathogenesis.

Creation of a New Sabin Oral Poliovirus Vaccine [5]

From the lessons learned from studies of Poliovirus basic virology, our lab has identified key mutations that attenuate virus replication in cell culture and in animal models. By combining this knowledge we have created a novel Oral Poliovirus Vaccine (nOPV) that has been demonstrated to be effective in clinical trials. Using the framework of vaccine creation for poliovirus we are now attempting to use similar mechanisms to design vaccines for emerging enteroviruses.

SARS-CoV-2 [6]

The goal of this research is to understand the host-pathogen interaction of novel coronavirus and enable early drug discovery and vaccine development. This work will bring insight and hopefully an edge on treatments for a pressing public health concern. As people suffer from the disease caused by coronavirus (COVID-19), we aim to rapidly provide relevant information to the scientific community in order to increase options for treatments and vaccine
development.

Contact Us
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Source URL: https://andino.ucsf.edu/projects

Links
[1] https://andino.ucsf.edu/aim1
[3] https://andino.ucsf.edu/aim3
[5] https://andino.ucsf.edu/nopv