Small-Molecule Inhibitors Of Zika Virus Infection
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SUMMARY
UCLA researchers in the Department of Psychiatry and Biobehavioral Sciences, Department of Radiation Oncology and Department of Pathology have identified small molecules that show anti-Zika activity at low nanomolar and picomolar range.

BACKGROUND
Zika virus is an arthropod-borne flavivirus transmitted mainly by infected mosquitoes, and it can also be transmitted via maternal to fetal vertical transmission, blood product transfusion, organ transplantation, as well as through sexual contact. Zika virus is linked to fetal developmental abnormalities such as microcephaly, eye defects, and impaired growth when infection occurs in pregnant women, as well as severe neurological complications and possibly male infertility in adults. Outbreaks of Zika virus infection have occurred in Africa, Southeast Asia, and the Pacific Island and there are current outbreaks in the Americas, the Caribbean, and the Pacific. Unfortunately, there are no therapies available for Zika virus infection. Several small molecule drugs against Zika virus under development have reported sub-optimal bioactivity, with IC50 values in the micromolar range, and development of more effective treatment for Zika infection is needed.

INNOVATION
Researchers at UCLA have discovered several small molecule compounds that inhibit the Zika virus pathogen using an in vitro plaque model of the virus. Identified compounds from several classes of chemicals have shown good activity and their chemical structures suggest good potential for oral bioavailability. Some compounds are commercially available and FDA-approved, with bioactivity and toxicity data available to expedite pharmaceutically relevant modifications and optimizations. IC50 values for the most efficacious compounds are in the sub-nanomolar range (190 pM).

APPLICATIONS
▶ Prophylactic, post-exposure prophylactic, and treatment option for Zika virus infections in general and high-risk populations
▶ Potential leads for the development of prospective anti-Zika drugs

ADVANTAGES
▶ More effective (IC50 at picomolar range) than other small molecule inhibitors
▶ Conform to Lipinski’s rule of bioavailability criteria
▶ Compounds are commercially available or can be synthesized easily and inexpensively
▶ Some of the compounds are FDA-approved

STATE OF DEVELOPMENT
Based on previous results, second generation of anti-Zika compounds was synthesized and is being tested in vitro. Selected compounds are currently tested in vivo.

PATENT STATUS
Patent Pending

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS
▶ Modification of Peptides Using bis(thioether) ArylBridge (tAB™) Approach
▶ Anti-Obesity Compounds Derived from Neuromedin U
▶ Inhibitors Of Zika Virus