Docket #: S20-082

Antiviral CRISPR Systems for Modulating Host Immune Response and Targeting the Virus Genome

Researchers at Stanford have developed a CRISPR-based system to degrade viral RNA, with potential applications as both an anti-viral therapeutic and a prophylactic treatment against influenza, SARS-CoV-2, and other viruses. Harnessing CRISPR's natural role as a defense mechanism against invading viral genomes, this technology utililzes guide RNAs targeting conserved regions of the virus' genomic sequence. When paired with the Cas13d nuclease, guide RNAs direct the enzyme to degrade targeted regions of the viral genome. This technology will find broad applications across a wide range of viruses, representing both a treatment strategy for common endemic and pandemic viruses and a way to control future viral outbreaks.

Stage of Development

Proof of Concept

Applications

- Antiviral treatment for COVID-19 and influenza
- Antiviral prophylactic for COVID-19 and influenza

Advantages

- Overcome/avoid viral resistance
- Broad anti-viral coverage
- Flexible drug design
- Flexible delivery method, including non-viral and viral packaging

- Alternative and complementary to current vaccine or drug trials

Publications

- Abbott, T. R., Dhamdhere, G., Liu, Y., Lin, X., Goudy, L., Zeng, L., ... & Qi, L. S. (2020). Development of CRISPR as an antiviral strategy to combat SARS-CoV-2 and influenza. Cell, 181(4), 865-876.

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