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High Affinity Synbodies for Influenza

Highly virulent strains of influenza virus are a critical public health concern with 3,000-5,000 people dying each year from influenza infection in the United States alone. Influenza is a continually evolving pathogen that develops resistance easily, including to recently approved antivirals. Rapidly diagnosing and typing influenza is essential in surveillance and deciding whether to administer therapeutics. Current ELISA kits for influenza detection are approved for the point-of-care setting, however, they suffer from variability, sensitivity, selectivity and stability.

Researchers at the Biodesign Institute of Arizona State University have developed novel synthetic antibodies (synbodies) having high affinity for influenza virus. These synbodies are specific for nucleoprotein, which is a highly conserved protein (>98%) among all the influenza strains and as such could have broad spectrum potential. Applications include diagnosing a patient with influenza virus, research reagents or alternatively, linking a therapeutic molecule to the Synbody for highly targeted treatment. Optimization strategies have been employed to create synbodies with incredibly high binding affinity (KD<200pM) as well as improved cell penetration for interfering with virus replication and a longer half-life.

These high affinity synbodies have been optimized to effectively target a highly conserved protein in most influenza strains to provide improved compositions that can not only detect but also treat influenza infections.

Potential Applications

- Diagnostics for Influenza
- Therapeutic compositions for Influenza
- Research Reagents

Benefits and Advantages

- Binds with high affinity - lead candidates have KD values greater than 200pM for Influenza Nucleoproteins
- Designed with a functional group to aid in attaching to a cell penetrating

peptide

- Work with in vivo imaging to study bio-distribution
- Inhibits sufhydryl exchange to increase circulating half-life in vivo
- Does not require prior genetic information or BSL-3 conditions for discovery
- Robust scale-up process
- Thermally stable – can be used in remote areas

For more information about the inventor(s) and their research, please see Dr. Johnston's departmental webpageDr. Diehnelt's departmental webpage