TECHNOLOGY ID: TAB-3843

Engineered Cell-Penetrating Monoclonal Antibody for Universal Influenza Immunotherapy

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Development Status: Pre-Clinical

Research Products: Antibodies

Influenza remains a burden on public health, as current treatments of viral infections remain ineffective due to frequent virus mutations. Many current influenza treatments rely on targeting surface viral glycoproteins. Unfortunately, these glycoproteins are primary targets of the immune system, which results in increased selection pressure and mutational rate, leading to the well-known seasonal variation of influenza virus. In contrast, the nucleocapsid viral protein (NP), located in the interior of the virus, is more conserved and an ideal antibody target;

however, NP is inaccessible to extracellular antibodies produced in response to infection. To circumvent the challenge of targeting NP, scientists at NIAID have developed an antibody genetically fused with a cell penetrating peptide (CPP-mAb) that targets NP within infected cells to effectively inhibit viral replication. By targeting NP rather than the surface glycoproteins, this CPP-mAb can treat more influenza variants, potentially across flu seasons, and is an improvement upon current influenza treatments.

This technology is available for licensing for commercial development in accordance with 35 U.S.C. § 209 and 37 CFR Part 404, as well as for further development and evaluation under a research collaboration.

Commercial Applications

- Clinical Treatment: CPP-mAbs against influenza NP may be a reliable and effective method to treat patients infected with varying subtypes of influenza, by targeting a functionally conserved protein.
- CPP-mAbs could be a viable alternative to the treatment of influenza when other treatments are ineffective, potentially lowering the mortality and morbidity rates in populations susceptible to influenza infection.

Competitive Advantages

- Current vaccines remain effective for a short time period, due to the ever-changing nature of the viral surface glycoproteins. CPP-mAbs could remain effective for a longer time period by targeting the interior NP of influenza, which is more conserved across influenza subtypes.
- Other attempts to produce vaccines against conserved portions of the surface viral glycoproteins have failed to produce a robust and reliable vaccine. CPP-mAbs could be a more reliable therapeutic agent compared to alternatives, potentially effective across flu seasons.
- In vivo efficacy: CPP-mAbs against NP increase survivorship in mice infected with mouse Influenza A virus, demonstrating therapeutic protection.

Patents

US Application 63/365,841
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Collaborations

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Collaboration

Collaboration Description

The National Institute of Allergy and Infectious Diseases is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this invention. For collaboration opportunities, please contact Benjamin Hurley; 240-669-5092, benjamin.hurley@nih.gov.

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