POLSKY Center for Entrepreneurship and Innovation
THE UNIVERSITY OF CHICAGO

Broad-Spectrum, Neutralizing Influenza Antibodies

SUMMARY

Broadly-neutralizing antibodies recognize the conserved hemagglutinin (HA) stalk domain of H7 influenza, commonly avian influenza. Targeting the conserved stalk region increases the breadth of influenza strains that can be recognized by these antibodies and decreases the potential for developing influenza escape variants.

KEY RESULTS

Dr. Patrick Wilson and his team have demonstrated protection and therapeutic efficacy against a lethal challenge of different clinical isolates of 0f H7N9 in mice. These antibodies are also cross-reactive with other group 1 (H1 and H5) and group 2 (H3, H7, H15) HA proteins for a broad range therapeutic.

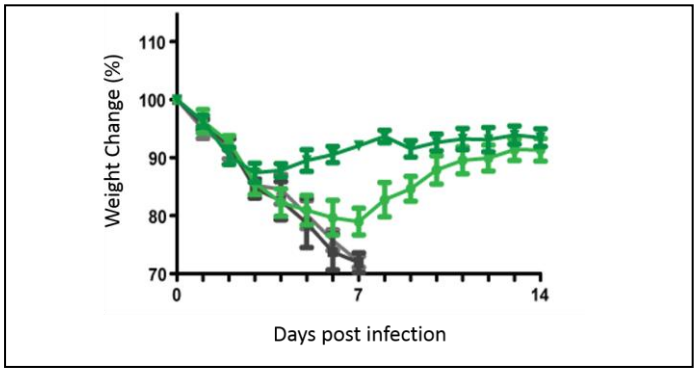
ADVANTAGES

- Combats the pandemic influenza strain H7N9.
- Effective at neutralizing multiple influenza strains (H1, H3, H5, H7, H15).
- Binds a conserved region of the virus to reduce viral evasion.
- Targets emerging influenza strains.

APPLICATIONS

- Influenza therapy.
- Development of vaccines.

Treatment of H7 Infection with Neutralizing Antibodies



Mice infected with a lethal dose of H7N9 were administered therapeutic antibodies 24 hours (dark green line) or 72 hours (light green line) after infection. Mice treated with antibodies had superior prognosis compared to untreated or placebo treated mice (grey lines).

TECHNICAL DESCRIPTION

Hemagglutinin (HA) is a trimeric glycoprotein on the surface of influenza viruses that enables the virus to bind to and release from host cells. HA is composed of a globular head domain and a stalk domain that interacts with the host cell receptors and a stalk domain. Unlike the variable HA head domain, the stalk domain retains conserved antigenic sequences across, making it an attractive therapeutic target. Dr. Patrick Wilson and colleagues identified effective neutralizing antibodies against H7 strains that cross-react with other group 1 and group 2 influenza strains for efficacy against multiple flu strains. These antibodies bind and recognize the HA epitopes in a structurally different manner from current antibodies in development, making these antibodies more effective. In a lethal mouse model of influenza infection, prior administration or administration post-infection of the antibodies provided protection against H7N9 strain, such as A/Shanghai/1/2013. Escape variants of influenza proved less virulent than the original strain, demonstrating that the antibodies are hitting critical viral antigens. Together, these results indicate that these broadly neutralizing antibodies may contribute to therapies against H7N9 strains and may also be effective against pathogenic H7 strains that emerge in the future.

REFERENCE
UCHI 2365

DEVELOPMENT STAGE
Pre-clinical

THERAPEUTIC AREAS
Infectious Disease
Influenza

PUBLICATIONS
Dunand et al. 2015 *The Journal of Clinical Investigation.*

INTELLECTUAL PROPERTY
PCT/US15/66281

INVENTOR(S)
Patrick C. Wilson, PhD

Dr. Wilson is an associate professor of medicine and innovator in the field of immunology for translational medicine. He heads a research group focusing on antibody specificity and differentiation of B cells, developing powerful approaches to generate antibodies for various diseases such as autoimmune and infectious diseases.

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