

A Monoclonal Antibody for the Prevention and Treatment of Pneumonia Caused by Influenza

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Intellectual Property:

Issued Patents:

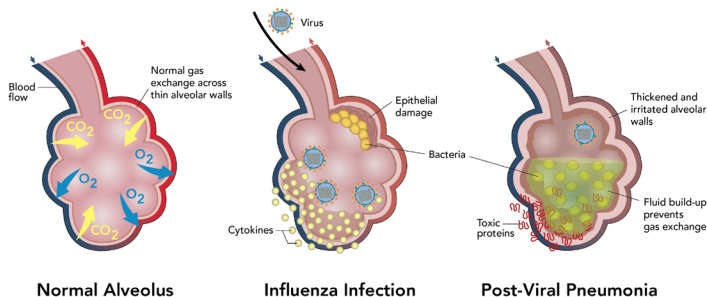
- U.S.: 10,077,309
- Japan: 6495434
- China:
ZL201580042405.4

Pending Applications:

- Europe: 15822298.4
- Canada: 2,954,518
- Australia: 2015289831

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Clinical Need:

Highly contagious viruses like Influenza A (IAV) and B, and SARS-CoV-2, are significant causes of morbidity and mortality. Some patients' immune response can cause excessive inflammation and lung injury (cytokine storm). This cytokine storm causes complications including post-viral pneumonia and ARDS, which are the leading cause of death in these patients. Current treatments – vaccines, anti-viral drugs, biologic and small molecule anti-inflammatory inhibitors – focus on the virus, not the host.

Value Proposition:

To provide a novel, host-targeted antibody therapy to treat patients who have an excessive immune response to the influenza virus by mitigating the destructive effects to the lungs leading to increased patient survival and reduced recovery time.

Technology Solution:

Penn State College of Medicine researchers have developed an injectable therapeutic monoclonal antibody (mAb), P2H10, which targets a surfactant protein receptor (SP-R210) in the lining of the lung's alveolar surface. P2H10 binds to macrophages and blocks excessive inflammation enabling the lung to restore surfactant production. In laboratory studies, mice infected with IAV and treated with P2H10 show better overall survival and reduced hypoxia as compared to mice treated with IgG2a and IgG1 isotypes and anti-TNF- α . By targeting the host, P2H10 is expected to remain effective even in the presence of novel influenza strains, whether seasonal or pandemic, and should not drive viral resistance.

Market Opportunity:

Seasonal influenza A and B viruses and pandemic influenza A viruses cause highly contagious respiratory infections with substantial mortality ranging from hundreds of thousands to many millions. In 2017-18, seasonal influenza caused an estimated 810,000 hospitalizations and 61,000 deaths in the United States. During pandemics, such as the current SARS-CoV-2 global outbreak, morbidity and mortality rates are even higher.

Path Forward:

A start-up company, Respana Therapeutics, is in licensing negotiations with the Penn State Research Foundation and is pursuing a Phase II STTR grant that will validate the therapeutic efficacy of humanized P2H10 mAb.



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