Researchers announce a discovery in how FluMist elicits protection

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New research from the Trudeau Institute may help to explain why live attenuated influenza vaccine (LAIV), commonly known as FluMist, elicits protection. The research is published in this month's issue of *Vaccine*. The journal article is entitled "Live attenuated influenza vaccine (LAIV) impacts innate and adaptive immune responses" and was authored by Trudeau Institute scientist Dr. Laura Haynes and her colleagues.

"Our research specifically examines how the vaccine, which is commonly known as FluMist, elicits protection," said Dr. Laura Haynes. "Influenza infection normally induces a massive inflammatory response in the lungs that leads to significant illness and increases the susceptibility to secondary bacterial infections. The most efficient way to prevent influenza infection is through vaccination. To date, the mechanism of how FluMist induces protection has been unclear. Our study demonstrates that this vaccine works by inducing a very early non-specific immune response in the lungs in a mouse model of influenza infection."

The very early non-specific immune response sets the stage for the early influx of virus-specific immune cells, which are necessary for viral clearance. Importantly, this immune response is protective against both matching and non-matching influenza strains, therefore it could provide a level of protection in the case of a newly emergent influenza strain.

In addition, this very early immune response also serves to limit lung

inflammation by significantly reducing the levels of inflammatory cytokines and chemokines produced following influenza infection. This novel finding provides insight into how this influenza vaccine functions and is important because inflammation is a major cause of damage in the lungs and this can set the stage for secondary bacterial infections, which are quite common following influenza infection.

The study goes on to show that the LAIV vaccine also induces a robust immune response in healthy adult volunteers. These translational experiments were carried out in collaboration with the Respiratory Diseases Research Department at the Naval Health Research Center (NHRC) in San Diego, CA and were the result of a joint Trudeau/Department of Defense contract.

Subjects were recruited by NHRC and were administered the commercially available FluMist vaccine. At specific time points following vaccination, the immune response to the vaccine was examined. Following LAIV vaccination, chemokines and cytokines involved in virus-specific lymphocyte recruitment were produced. This is indicative of a protective immune response and would lead to the early recruitment of immune cells to the lung should influenza infection occur. Importantly, early recruitment of immune cells to the lung is highly desirable since this then leads to accelerated viral clearance and reduced levels of inflammation.

Provided by Trudeau Institute