

Human vaccine against bird flu a reality with new discovery

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A vaccine to protect humans from a bird flu pandemic is within reach after a new discovery by researchers at the University of Melbourne, Australia.

The discovery, published today in the prestigious *Proceedings of the National Academy of Sciences*, reveals how boosting T cell immunity could better protect humans from a bird flu pandemic.

The continued spread of the highly virulent "bird flu" virus has experts worried that we are facing a new potential influenza pandemic which could transfer between humans. Furthermore, given the bird flu is new, there is no pre-existing immunity in the population and current vaccine formulations would be useless.

"The 'Killer T cell' is the hit-man of the immune system. It is able to locate and destroy virus-infected cells in our body helping rid us of infection," said A/Prof Stephen Turner, from the Department of Microbiology and Immunology at the University of Melbourne who is a lead author on the paper.

"Unfortunately, current influenza vaccines are poor at inducing killer T cell immunity. Therefore, we wanted to see if we could improve the current vaccine formulation to induce killer T cells after vaccination," he said.

"We added a compound, known to increase immunity, to the flu vaccine

in an animal model. The addition of this compound promoted significant generation of potent killer T cell immunity and provided protection from infection.

"The significance of these findings is that rather than having to design a new vaccine altogether, we can improve current flu vaccines by adding this potent immune modulator.

"With appropriate clinical testing, we could see improvements to current vaccines within the next five years."

Dr Turner said the key to vaccine effectiveness was ensuring a match between the vaccine and the current circulating flu strain. However, the spike proteins varied over the course of a flu season rendering the current vaccine ineffective. As such, the vaccine needs to be updated every year to match the likely strain for that winter.

"It is a different situation for influenza pandemics. Pandemics arise due to the introduction of a new influenza virus into human circulation. As such, there is little or no pre-existing immunity to the bird flu virus enabling it to spread rapidly."

"'Killer' T cells recognise components that are conserved between different influenza viruses. Therefore, a vaccine strategy that induced killer T cells pre-emptively would provide protection from a potential pandemic."

Source: University of Melbourne

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