

Bird flu expert working on vaccine that protects against multiple strains

10 May 2013, by Elizabeth K. Gardner

(Medical Xpress)—As the bird flu outbreak in China worsens, a Purdue University expert is working on vaccines that offer broader protection against multiple strains of the virus.

The [World Health Organization](#) warned in a news conference that the virus behind the current outbreak, H7N9, is one of the most lethal seen in recent years. There have been 32 reported deaths from this [avian influenza virus](#).

Suresh Mittal, a professor of comparative [pathobiology](#) in Purdue's College of Veterinary Medicine, has developed a new vaccination method that incorporates genes from multiple strains of the virus and creates protection that could persist through different mutations, he said.

"Avian influenza viruses are moving targets that rapidly evolve and evade vaccines that are specific to a predicted strain," Mittal said. "We need a vaccine that protects against a spectrum of strains to prepare for a potential pandemic. Such a vaccine may not offer full protection from the strain that pops up, but even partial protection could save lives and buy time to create a more effective vaccine."

Mittal created vaccines for past strains of [bird flu](#) and continues to collaborate with the [Centers for Disease Control and Prevention](#).

"The strain responsible for the current outbreak appears not to be easily transmitted from person to person, which occurs effectively in a pandemic situation," he said. "Fortunately, avian influenza in humans tends to replicate deep in the lungs where it can't easily get out through coughing. However, the more people this virus infects, the more chances it has to evolve. It is important to keep a close watch on this outbreak."

The H7N9 is a new strain of avian influenza virus with the potential to infect humans, he said.

Mittal's method uses a harmless adenovirus as a vector to deliver avian influenza virus genes into the body where they create a two-fold immune response of antibody and cell-based protection. The adenovirus vector-infected host cells produce influenza proteins that lead to the creation of antibodies and special T-cells primed to kill the virus and any cells infected by it.

Any genes important to avian influenza virus protection can be incorporated into the [adenovirus](#) vector, and it can be designed to expose the immune system to both the surface and internal components of the virus. In this way the immune system can be primed to recognize portions of the virus that predominately remain the same across all strains and those that are more difficult for the virus to change as it adapts to the immune system attack, he said.

Mittal and CDC collaborators created a vaccine in 2006 for the H5N1 bird flu virus, and the work was described in papers for *The Lancet*, *The Journal of Infectious Diseases* and the *Journal Clinical Pharmacology and Therapeutics*.

Provided by Purdue University

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