

Bit of duck DNA might protect poultry from flu, scientists say

March 26 2010, By Amina Khan



A cock and a hen roosting together. Image: Wikimedia Commons.

Influenza has for years ravaged domesticated chickens. Now scientists suggest that a small piece of duck DNA might protect the farm birds against the virus -- saving commercial flocks and lessening the possibility that humans could be exposed to dangerous strains of the disease.

In a study published online March 22 in <u>Proceedings of the National</u> <u>Academy of Sciences</u>, researchers said they've found that a key influenza-fighting gene in wild ducks is absent in <u>chickens</u>. Genetically modifying chickens with a copy of that gene might render them resistant to influenza A, the most common form of flu infecting humans.



"If we could shut down influenza (in chickens), it would be of great commercial interest," said lead author Katharine E. Magor, a comparative immunologist at the University of Alberta in Edmonton.

All forms of influenza originate in ducks and other <u>wild birds</u>, which generally carry the virus with no ill effects, releasing it into the environment when they defecate.

Magor had been trying to understand why ducks had such an effective automatic response to influenza when she heard at a conference that chickens lacked a gene called RIG-I. This gene carries the code for a protein that immediately detects the RNA of the <u>influenza virus</u> after the virus invades the duck's lung and tracheal cells. It then sets off a chain reaction inside those cells to help fight off the disease.

Intrigued, she and her colleagues from the University of Alberta and St. Jude Children's Research Hospital in Memphis, Tenn., searched for the RIG-I gene in chickens and failed to find it. Then they inserted the duck gene for RIG-I into embryonic chicken cells to see whether it made the cells immune to infection by <u>influenza</u> viruses.

The scientists infected the chicken cells with two strains: one run-of-themill H5N2 virus that lived in but did not harm wild ducks, and a deadly H5N1 strain isolated from a human fatality in Vietnam that was known on occasion to kill ducks as well.

"This strain ... kills everything -- chickens in 18 hours, mice, humans -but the virus didn't kill my ducks," Magor said. The virus didn't kill the chicken cells containing the duck gene, either -- but it did kill normal chicken cells that lacked it.

"This study underscores the importance of this particular gene in fighting viral infections," said Adolfo Garcia-Sastre, a virologist at



Mount Sinai School of Medicine in New York, who was not involved in the research.

Garcia-Sastre called the potential for creating a transgenic chicken immune to bird flu "a very attractive hypothesis."

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