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Study finds potential treatment for drug-resistant H7N9 influenza virus

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The novel avian H7N9 influenza virus has caused more than 130 human infections with 43 deaths in China. New research, conducted under the supervision of Kansas State University's Juergen Richt, is showing promise in helping to fight this deadly virus.

"Emergence of a novel drug-resistant H7N9 influenza virus: Evidence-based clinical potential of a natural IFN-alpha for infection control and treatment" is set to publish in an early online edition of January's *Expert Review of Anti-infective Therapy* journal.

Richt is a regents distinguished professor and Kansas Bioscience Authority eminent scholar at Kansas State University's College of Veterinary Medicine. He also is the director of the U.S. Department of Homeland Security's Center of Excellence for Emerging and Zoonotic Animal Diseases, or CEEZAD, at the university. The center is working with scientists at Hemispherx Biopharma Inc. to develop novel pharmacological treatments. Research for the H7N9 project was conducted at the university's Biosecurity Research Institute, primarily by Qinfang Liu, a postdoctoral fellow in diagnostic medicine and pathobiology in Richt's laboratory.

Richt is recognized as an expert on zoonotic agents and has published extensively on the monitoring of mutations and basic events leading to cross-species transmission of influenza viruses and the opportunities to adapt to human hosts, with the potential to cause a pandemic. Because of the lack of existing immunity against H7 subtype influenza viruses in the

human population and the absence of a licensed commercial vaccine, antiviral drugs are critical tools for the treatment of human infections with this novel H7N9.

"Both M2-ion channel blockers, such as amantadine, and neuraminidase inhibitors, such as Tamiflu or Relenza, are used as antiviral drugs for influenza infections of humans," Richt said. "The emerging H7N9 viruses are resistant to the M2-ion channel blockers and some also to neuramidinidase inhibitors because of mutations in the respective viral proteins. In this study we report that Alferon N can inhibit wild type and Tamiflu-resistant H7N9 virus replication in vitro. Since Alferon N is approved for clinical use, this would allow a rapid regulatory approval process for this drug under pandemic threat."

The research was partially funded by the National Institute of Allergy and Infectious Diseases, a part of the National Institutes of Health in the Department of Health and Human Services; the Department of Homeland Security; and Hemispherx Biopharma.

CEEZAD, officially inaugurated in June 2010, enhances the capability of the Department of Homeland Security by developing state-of-the-art countermeasures for high priority emerging and zoonotic animal diseases. Richt also a professor of diagnostic medicine and pathobiology at Kansas State University's College of Veterinary Medicine.

Provided by Kansas State University