



Uniformed Services University

of the Health Sciences

4301 Jones Bridge Road, Bethesda, MD 20814-4799

<http://www.usuhs.mil>

Release No. 03-05-11

May 15, 2003

Contact: The Office of University Affairs

Voice: 301-295-9702/3166 **Fax:** 301-295-3757

Email: abennett@usuhs.mil

News Release

USU professor presents Ebola virus research findings at ATS 2003

Bethesda, Md. -- Elliott Kagan, M.D., professor of pathology at the Uniformed Services University of the Health Sciences, will present the results of a research project on Ebola virus, a potential bioterrorism agent, at the 2003 American Thoracic Society's 99th International Conference, May 16-21, in Seattle, Wash.

The presentation is entitled "Ebola Virus Zaire Subtype Can Replicate and Induce the Formation of Reactive Nitrogen Species in Human Bronchial Epithelial Cells."

The research was a collaborative effort between Kagan and Ying-Yue Li of USU, as well as Thomas W. Geisbert, Lisa E. Hensley and Peter B. Jahrling of the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), Fort Detrick, Md.

"Ebola virus is a potential bioterrorism agent that could be delivered via the aerosol route," Kagan said. "Little is known about what actually might happen if aerosolized Ebola virus is inhaled by humans and, specifically, about the ability of the virus to enter and replicate in human lung cells."

To address this, the group used an *in vitro* model to simulate the effects of Ebola virus infection on the human respiratory tract by using primary cultured, differentiated normal human

bronchial epithelial cells (HBEC) in an air-liquid interface. For this purpose, the Ebola virus Zaire subtype, the most lethal of the four Ebola virus varieties, was employed.

Since live Ebola virus was used, infecting the cells required that the studies be performed in a secure (Biosafety Level-4) biocontainment facility at USAMRIID under the supervision of Jahrling and his associates, Kagan noted.

The researchers found that the virus could infect human bronchial epithelial cells -- the cells lining the airway of the lungs -- and could replicate for as long as three weeks in these cells without destroying them.

“In this respect, HBEC behaved very differently from other Ebola-virus-infected human cells, such as cultured human endothelial cells or macrophages,” Kagan said.

“The Ebola infection of the bronchial epithelial cells also induced the formation of reactive nitrogen species, molecules which are produced that can be injurious to cells,” Kagan explained. “So, not only are these human lung cells permissive for entry of the Ebola virus, but conceivably, if the virus were inhaled, its long-term replication in the bronchial epithelium might possibly create a persistent reservoir of infection in the lungs that could possibly spread to other individuals.”

The investigators plan to extend these research studies to an *in vivo* model.

USU was established by Congress under the Department of Defense in 1972 and has the nation’s only fully accredited federal school of medicine and graduate school of nursing. With its motto “Learning to Care for Those in Harm’s Way,” the university has a worldwide reputation as a center of excellence for military medical education and research.