Discovery by UT researcher reveals a new way the body fights viruses

By Rebecca Schwan: June 3rd, 2016

We live in a world of viruses, and our bodies are constantly under attack. The immune system is our defense shield, continuously defending us against illness and disease. A study by researchers at The University of Toledo and Cleveland Clinic revealed a new pathway in the way the body fights disease.

“The immune system is made up of two categories: the innate and the adaptive,” said Dr. Saurabh Chattopadhyay, UT assistant professor of medical microbiology and immunology. “Both are required for a successful defense against virus infection.”

The innate immune system is the body’s first line of defense. It must activate quickly and correctly to begin the elimination of viruses from the body. The adaptive immune system is dependent on the innate system and is activated at a later stage. The innate immune system triggers sensors within the body’s cells, creating antiviral proteins called interferons that serve as messengers alerting uninfected cells of the unwanted virus.

But viruses don’t give up easily. Some have evolved to find ways to dodge the body’s defenses. Fortunately, our bodies have yet another way to fight back against stubborn viruses.

“As a new line of defense, virus-infected cells rely on a mechanism called apoptosis, or premature suicide, in order to keep the virus from spreading,” Chattopadhyay said. “In this process, proteins in the cells are activated, causing the infected cells to be killed in an effort to efficiently remove virus from our bodies.”

A recent study by Chattopadhyay and his team revealed a new way the body triggers this process. Using common respiratory viruses, they discovered a pathway named RLR-induced IRF3-mediated Pathway of Apoptosis, or RIPA.

“This discovery explains how the virus-infected cells trigger apoptosis,” Chattopadhyay said. “Once RIPA is activated, the cell begins apoptosis, leading to cell destruction and elimination of the virus.” The results of this study were recently published in the scientific journal Immunity. “We are very excited that this pathway may also provide insight into the impact of RIPA against other viral, bacterial, parasitic and non-microbial diseases,” Chattopadhyay said.