

Researchers identify key molecular step to fighting off viruses

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UT Southwestern Medical Center researchers have determined how a protein that normally latches onto molecules inside cells and marks them for destruction also gives life to the body's immune response against viruses.

The researchers discovered that a certain form of the "death" [protein](#) ubiquitin interacts with another protein, called RIG-I, but does not mark it for destruction. Instead, this form of ubiquitin binds to and activates RIG-I, which is known to trigger the body's [immune system](#) when a virus invades a cell.

Dr. Zhijian "James" Chen, professor of molecular biology at UT Southwestern, is senior author of the study, which is available online and in the journal *Cell*.

Dr. Chen and his colleagues reconstituted key elements of the human innate immune system in laboratory test tubes and found ubiquitin forms a unique chain-like structure that associates with RIG-I before RIG-I can get to work fighting viruses. The innate immune system is the body's first generic response against invading pathogens.

"Activation of RIG-I is the first line of our immune defenses against [viral infections](#)," said Dr. Chen, an investigator for the Howard Hughes Medical Institute at UT Southwestern. "Understanding how it comes to life is a key step in developing new approaches to antiviral therapies. Having this test-tube system could help us identify substances that

enhance the body's antiviral immunity."

Dr. Chen said his team's experiments mark the first time innate immunity has been recapitulated in a test tube. The findings provide one of the missing pieces in the complex puzzle of how the body fights off infection, he added.

Dr. Chen is now focusing on how activated RIG-I interacts with another protein called MAVS, also essential for [immune response](#).

Provided by UT Southwestern Medical Center

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