TLR1 protein drives immune response to certain food-borne illness in mice

July 10 2012

A naturally occurring protein called TLR1 plays a critical role in protecting the body from illnesses caused by eating undercooked pork or drinking contaminated water, according to new research from the University of Southern California (USC).

The discovery may help create more effective oral vaccines for infections of the respiratory and gastrointestinal systems and already has launched an examination of how TLR1 is linked to inflammatory bowel disease, says R. William DePaolo, assistant professor of molecular microbiology and immunology at the Keck School of Medicine of USC and the study's lead investigator.

"It's not clear what drives the body's immune response," DePaolo said. "This paper identifies a receptor that is important in driving a mucosal immune response against Yersinia enterocolitica, bacteria like Salmonella and E. coli that can cause food poisoning. Although the receptor's role against other bacteria is still unknown, our research emphasizes that the way the body initiates an immune response depends on the pathogen and the route of infection."

The study, "A specific role for TLR1 in protective TH17 immunity during mucosal infection," is scheduled to appear in the July 30 edition of The Journal of Experimental Medicine, a leading biomedical journal published by the Rockefeller University Press. The manuscript is now available on the journal's website.

DePaolo's team compared the immune responses of mice bred with and without TLR1 when infected with Y. enterocolitica by mouth and by blood. They found that TLR1 played a significant role in controlling mucosal infection (by mouth) but not systemic infection (by blood), initiating the creation of antibodies that specifically fight against oral infections.

"Now that we have identified the receptor's role, the next step is to determine how we can manipulate that receptor to enhance vaccine development," DePaolo said. "We also are studying the receptor in different models of mucosal inflammation including inflammatory bowel disease and colitis-associated cancers. The idea is to take a personalized approach to medicine and use genetic profiling to better treat or manage disease."

Provided by University of Southern California

Citation: TLR1 protein drives immune response to certain food-borne illness in mice (2012, July 10) retrieved 9 April 2024 from https://medicalxpress.com/news/2012-07-tlr1-protein-immune-response-food-borne.html