Researchers identify a potential new therapeutic target for E. coli infections

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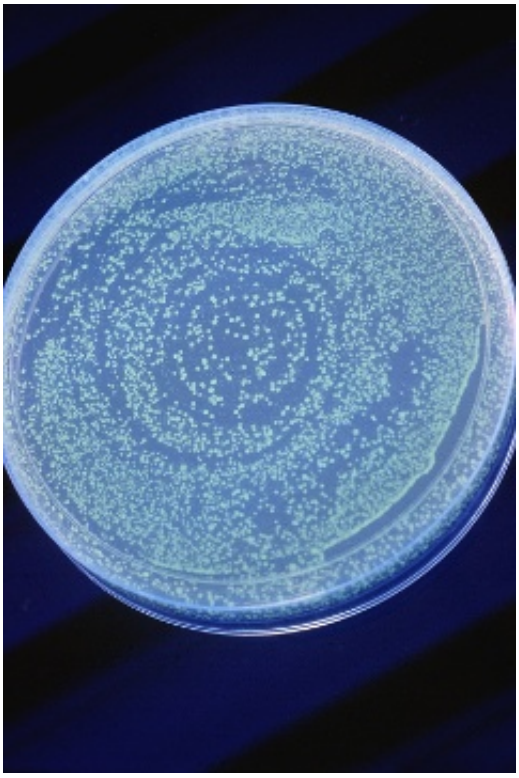

Virginia Bioinformatics Institute researchers study how various bacteria cause health problems in people and animals.

(Medical Xpress)—A new study by researchers at the Center for Modeling Immunity to Enteric Pathogens at Virginia Bioinformatics Institute provides novel insight into how an emerging strain of the diarrhea-causing bacteria E. coli interacts with its host.

The discovery about enteroaggregative Escherichia coli (EAEC) could be used by scientists to devise new therapeutic strategies against the disease. The study was published recently in *PLOS One*.

EAEC infection is the most common cause of persistent diarrhea worldwide and is most frequently seen in malnourished children living in developing countries. Because these children are unable to mount an effective immune response to the bacteria, the infection often persists once it gains a foothold. A 2011 outbreak in northern Germany received international attention when it sickened more than 3,000 people, causing 53 deaths.

"In many parts of the world, the relationship between infection and malnutrition is a vicious cycle. For example, malnourished EAEC-infected individuals experience a chronic burden linked to growth retardation. Our study in mice suggests that promoting inflammation may help clear the bacterial infection soon after infection," said Josep Bassaganya-Riera, a professor of immunology, director of the Nutritional Immunology and Molecular Medicine Laboratory, and the principal investigator of the center.

The MIEP team created a mouse model of the infection to investigate host–bacteria interactions. Previous studies have shown that activation of PPAR γ, a protein that aids in metabolic regulation, plays a crucial role in suppressing inflammation and regulating immune responses. When investigators blocked the function of the protein in EAEC-infected mice, they observed that the animals developed a faster and more effective defense against the disease.

"Pharmacological inhibition of PPAR γ reduced disease and bowel pathology following infection by inducing potent inflammatory responses. Protective immune responses to EAEC are characterized by the predominance of effector T helper 17 cells that promote

antimicrobial immunity and bacterial clearance," said Raquel Hontecillas, associate director of MIEP and lead investigator of the EAEC project.

Studying the bacteria and the ways in which PPAR γ can modulate immune responses in the gut may help researchers develop new therapeutic strategies to address such debilitating infections. This new work has enabled the MIEP team to test new therapies that may promote bacterial clearance. The Center for Modeling Immunity to Enteric Pathogens is funded by the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health, under Contract No. HHSN272201000056C.

More information: www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0057812

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