

Study helps explain how pathogenic *E. coli* bacterium causes illness

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Scientists at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, have shown how the O157:H7 strain of *Escherichia coli* causes infection and thrives by manipulating the host immune response. The bacterium secretes a protein called NleH1 that directs the host immune enzyme IKK-beta to alter specific immune responses. This process not only helps the bacterium evade elimination by the immune system, it also works to prolong the survival of the infected host, enabling the bacterium to persist and ultimately spread to unaffected individuals. This finely balanced mechanism, observed in both laboratory and animal models, could be relevant to other pathogens involved in foodborne diseases.

While most *E. coli* strains help check the growth of harmful bacteria in the guts of animals and humans, a few *E. coli* strains, such as O157:H7, can cause severe diarrhea, abdominal cramps and, in rare cases, death. Human cases of *E. coli* O157:H7 have been linked to consumption of raw, undercooked, or spoiled meat.

NIAID researchers plan to use the new information to further study how the host [immune system](#) mounts a response to *E. coli* O157:H7 when infection begins and how the [bacterium](#) selectively blocks these defenses. Several foodborne pathogens, including *Shigella* and *Salmonella*, use a similar secretion system to disrupt host immune responses and infect gut cells.

More information: F Wan, et al. IKK-beta phosphorylation regulates

RPS3 nuclear translocation and NF-kappa B function during infection with Escherichia coli strain O157:H7. *Nature Immunology*.

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