

Scientists identify protein that protects against Lyme

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Yale researchers have discovered a protein that helps protect hosts from infection with the tick-borne spirochete that causes Lyme Disease, a finding that may help diagnose and treat this infection, they report Nov. 11 in the journal *PLOS Pathogens*.

Lyme Disease is the most common vector-borne disease in North America and is transmitted by ticks infected with the spirochete *Borrelia burgdorferi*. The course of the disease varies among individuals, with the majority experiencing mild symptoms easily treated by antibiotics. However, in some cases of untreated Lyme the infection can spread to the heart, joints, [nervous system](#), and other organs.

For the study, the Yale team expressed more than 1,000 human genes in yeast and analyzed their interactions with 36 samples of *B. burgdorferi*. They found that one protein, Peptidoglycan Recognition Protein 1 (PGLYRP1), acts like an early warning signal to the immune system when exposed to the bacteria. When exposed to the Lyme spirochete, mice lacking PGLYRP1 had

much higher levels of *B. burgdorferi* than mice with the protein and showed signs of [immune system](#) dysfunction, the researchers report.

"Stimulating the ability of people to make more of this protein could help fight infection," said Yale's Erol Fikrig, the Waldemar Von Zedtwitz Professor of Medicine (Infectious Diseases) and professor of epidemiology (microbial diseases) and of microbial pathogenesis and co-corresponding author of the study.

Fikrig and his colleagues are also investigating whether people with higher levels of PGLYRP1 may be less susceptible to infection by *B. burgdorferi*, which would help explain why some infected individuals have better outcomes.

More information: Akash Gupta et al, A human secretome library screen reveals a role for Peptidoglycan Recognition Protein 1 in Lyme borreliosis, *PLOS Pathogens* (2020). [DOI: 10.1371/journal.ppat.1009030](https://doi.org/10.1371/journal.ppat.1009030)

Provided by Yale University

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