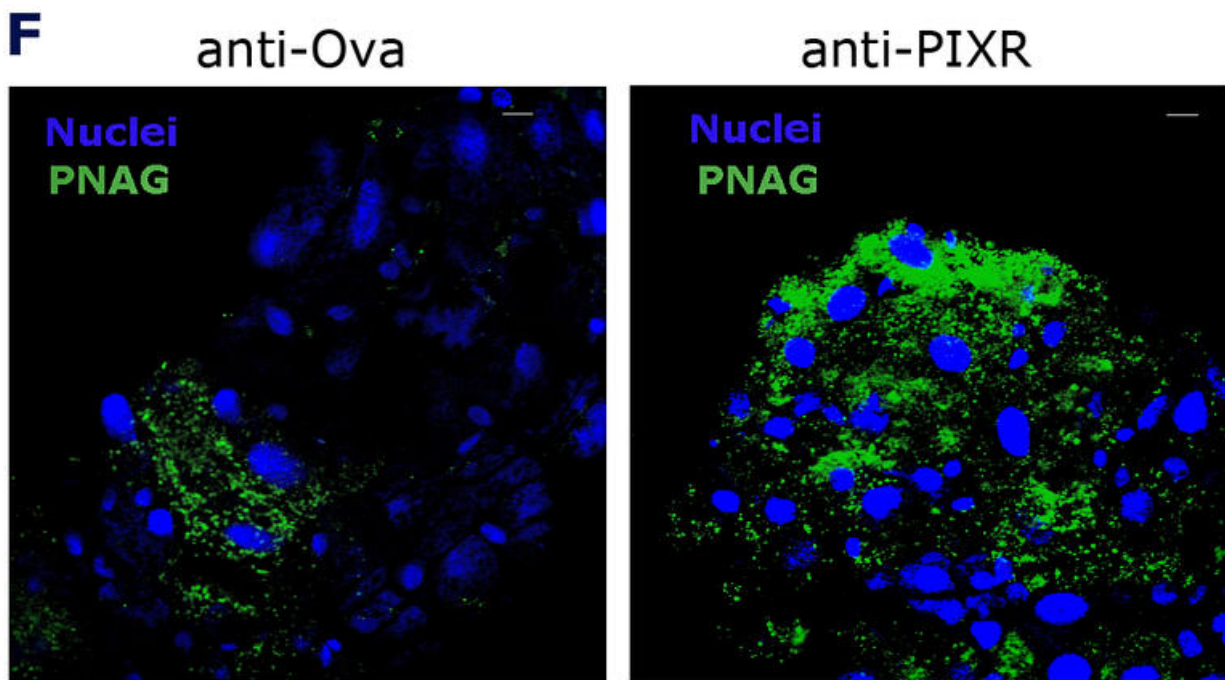


How a tick gut gene serves as a gateway for Lyme disease

August 7 2017, by Ziba Kashef



In the gut of ticks lacking the PIXR gene function (right) more biofilm forms to block Lyme disease infection compared to a control gut (left). Credit: Yale University

The bacterium that causes Lyme disease, *Borrelia burgdorferi*, may have some help from a gene found in the guts of infected ticks, according to a new study led by Yale researchers and published in *Nature*

Communications.

The research team identified a number of tick gut genes that demonstrated enhanced expression when infected by *B. burgdorferi*. One of those genes secretes a protein known as PIXR. When the researchers blocked the gene's function in ticks, colonization of the tick gut by the Lyme bacterium—a key step in sustaining infection prevalence in ticks—was limited. In the guts of ticks lacking PIXR, the researchers also observed changes in [gut microbes](#), gut metabolites, and gut immune responses. The changes included an increase in bacterial biofilm, or microorganisms that potentially form a sticky barrier to infection.

The findings suggest that the guts of ticks actively manage the microbes in their environment, turning that environment into a "barricade" or "gateway" to infection depending on the bacteria that dominate.

More information: Sukanya Narasimhan et al. Modulation of the tick gut milieu by a secreted tick protein favors *Borrelia burgdorferi* colonization, *Nature Communications* (2017). [DOI: 10.1038/s41467-017-00208-0](#)

Provided by Yale University

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