

# Lyme disease identified in Bay Area ticks, and it isn't alone

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Adult western black-legged ticks, which carry *B. burgdorferi* in California. Credit: Ervic Aquino

Finding evidence of Lyme disease in the San Francisco Bay Area didn't surprise a team of researchers, although it may be news to many doctors in the region. But identifying another tick-borne pathogen that causes relapsing fever was unexpected and may deserve a closer look.

"There's conflict about whether the pathogen *Borrelia burgdorferi* (the bacterial agent of Lyme disease) even exists in these spots," said Nathan Nieto, assistant professor of microbiology at Northern Arizona University. As a result, he said, the disease—usually accompanied by fever, rash and fatigue—often doesn't make the list when doctors are trying to make a diagnosis.

Lyme, after all, is named after a town in Connecticut and public awareness associates it with [ticks](#) in the northeastern United States, even though the disease has also gained a foothold in the upper Midwest.

Still, Nieto said the research team, which included collaborators from California, is "surprised at the

traction" the story is getting, considering that Lyme disease has been investigated there for 35 years. The real surprise, Nieto said, is that his lab also identified *Borrelia miyamotoi*, only recently recognized as a fever-causing pathogen that affects people.

The findings appear online in the March issue of *Emerging Infectious Disease*. Nieto sees the attention as just one more step in raising awareness about tick-borne pathogens.

"What we would like, for starters, is for clinicians to understand that Lyme disease is in the West," Nieto said. "But they also need to know that *B. miyamotoi* exists there."

The Nieto lab performed the molecular diagnostics and sampling of ticks recovered from parks throughout the Bay Area and NAU's Environmental Genetics and Genomics Laboratory performed the sequencing. Nieto said a group of undergraduate students, guided by himself and graduate student Stephanie Cinkovich, extracted DNA from the ticks, sequenced the genes and matched them through an online database.

Nieto explained that the hard ticks carrying Lyme disease do have their geographic limitations, so Arizona—except for a small area in the Hualapai Range near Kingman—remains unaffected. However, soft ticks, which carry pathogens that cause relapsing fever, thrive at higher and drier altitudes, and can be even more of a risk because their bites are less easy to detect.

For now, Nieto said, the current research project will continue to focus on specific areas of California.

"We're going to keep looking," Nieto said. "We're interested in identifying reservoirs of the *Borreliae* and how that translates to risk."

The work, he said, relates to the wider mission of

his lab, which studies numerous types of zoonotic pathogens, including hantaviruses.

"We would like to show on a map where different variations occur so we can show the public where the areas of highest risk are," Nieto said.

**More information:** Salkeld DJ, Cinkovich S, Nieto NC. Tick-borne pathogens in northwestern California, USA . *Emerg Infect Dis.* 2014 Mar. [DOI: 10.3201/eid2003.130668](https://doi.org/10.3201/eid2003.130668)

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