

Borrelia spirochete are masters at evading immune system

Friday, January 12, 2018

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Mice, guinea pigs, dogs, rabbits and monkeys have long been used to study *B. burgdorferi* infections. But given that rhesus macaques have been shown to most accurately mimic human infection and response to treatment, Embers and her team inoculated rhesus macaques with *B. burgdorferi*. “The use of nonhuman primates to model this disease provides the most accurate representation of human Lyme disease as demonstrated in this work,” [the authors explain in their article in PLoS One](#).

A select group of rhesus macaques were then treated with the recommended doses of doxycycline for 28 days at four months post-inoculation. The investigators found that “Lyme can be an insidious disease, with low numbers of spirochetes spread throughout the body.”

“When the animals were examined over a year past initial infection,” the authors explain, “detection of the pathogen was infrequent, whether or not antibiotic treatment was given.”

Persistent infection remained a concern despite the low number of *Borrelia spirochete*.

However, persistent infection remained a concern despite the low number of spirochete. “We observed evidence of persistent, intact, metabolically-active *B. burgdorferi* after antibiotic treatment of disseminated infection,” states Embers.

A persistent infection did not necessarily maintain an immune response. “Persistence may not be reflected by maintenance of specific antibody production by the host,” writes Embers. “A decline in C6 [antibody] levels was also observed in 2 of the 4 untreated monkeys that developed anti-C6 responses.”

The rhesus macaques model offers a better understanding of our human response to the spirochete. It would be helpful to find regimens that would be more effective including treating with doxycycline for longer than four weeks.

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[The risk of pain and fatigue after three weeks of Lyme disease treatment](#)

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References:

1. Embers ME, Hasenkampf NR, Jacobs MB, et al. Variable manifestations, diverse seroreactivity and post-treatment persistence in non-human primates exposed to *Borrelia burgdorferi* by tick feeding. PLoS One. 2017;12(12):e0189071.

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