

Bartonellosis: Diagnosing a stealth pathogen

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Ed Breitschwerdt.

(Medical Xpress)—NC State professor of veterinary internal medicine Ed Breitschwerdt has spent the last couple of decades working with *Bartonella*, bacteria historically associated with "cat scratch disease." *Bartonella* is increasingly recognized as a cause of persistent intravascular infection that can result in severe health effects. Research from Breitschwerdt's laboratory and others has led to the discovery of more than 30 new *Bartonella* species, as well as numerous chronically infected animal "reservoirs" for the bacteria and a variety of insects that can transmit *Bartonella* to both humans and animals.

[Bartonella species](#) are "stealth pathogens" – that is, bacteria that can

survive undetected for years in the human body. These bacteria infect [red blood cells](#), but can also live in the [endothelial cells](#) – the cells that line blood vessels and organs. Because Bartonella species can survive for such a long time within the [blood stream](#) and tissues, the symptoms of bartonellosis can take very divergent paths, resulting in "nonspecific" symptoms and an infection that is quite difficult to diagnose, let alone treat.

"We may be missing an epidemic," Breitschwerdt says, "because even when you know where to look for this pathogen, it is still difficult to find." To that end, Breitschwerdt believes that educating physicians, veterinarians and medical researchers about the way that Bartonella behaves across [animal species](#) may be one route to improving awareness and understanding of the diseases associated with these bacteria.

"We see diseases like endocarditis (inflammation of the cells lining the [heart valves](#)) occurring across animal species with these bacteria," Breitschwerdt says. "We've also found evidence of bartonellosis in the [lymph nodes](#) of cats, dogs, humans and other animals. It occurred to me that if you want to prove a link between persistent Bartonella infection and specific diseases, you should determine if a common pathology is shared across infected animal species. If researchers can document cross-species links, then clinicians and [medical researchers](#) would have more support for causation, which is very difficult to prove with stealth pathogens."

In fact, Breitschwerdt and colleagues have proposed that a new postulate be added to Koch's Postulates, a series of criteria that scientists refer to when determining whether or not a pathogen causes a disease. The proposed new postulate of comparative infectious disease causation appears in the *Journal of Comparative Pathology*. According to Breitschwerdt, "This new postulate further supports a One Health approach to the diagnosis, treatment and study of diseases that affect

animals, including human beings.

"I think that we can learn many important lessons from the genus *Bartonella* – most importantly that these bacteria function as stealth pathogens, and contribute to complex disease expression," Breitschwerdt continues. "Through this postulate, we're proposing that researchers study naturally occurring animal models – including humans – to better understand the ability of an organism to cause disease. I think that this approach will be useful in studying numerous infectious and noninfectious diseases going forward."

More information: [www.sciencedirect.com/science/ ...
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Provided by North Carolina State University

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