

Scientists develop new system to study emerging tickborne disease

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Tickborne diseases are on the rise, and one in particular is emerging in the United States and Canada. Human babesiosis is an infection that can cause a range of symptoms and even death. Little is known about one of the parasites that cause human babesiosis but a team of Yale-led researchers have developed a novel system for studying it. Their research

holds promise of leading to more effective diagnosis and better treatments, they said.

While scientists have studied the parasite—*Babesia duncani*—in mice and hamsters, the research has been limited because it's expensive and the animals often succumb to the disease. To overcome these challenges, the [research team](#) developed a way to study the parasite in [human red blood cells](#). They transferred the [parasites](#) from hamster red blood cells to human red blood cells cultured in vitro. This first-ever, continuous in vitro system of *Babesia duncani* allowed them to examine the parasite in human red [blood](#) cells over time and study its biology.

The authors reported several key findings. They confirmed that *Babesia duncani* can replicate rapidly in human [red blood cells](#), doubling in less than 24 hours. They also tested four current drugs that are used to treat the disease and found that the parasite has low susceptibility to these therapies.

The study is "a tipping point in the research on this organism," said senior author Choukri Ben Mamoun, associate professor of medicine. "It's going to change the way we study it." In addition to confirming that the current therapies are not optimal, the in vitro culture system allows the researchers to develop new diagnostic tests and search for more effective therapies.

"We believe that this new finding is going to stimulate the research and drive it exponentially," he said.

Read the full paper, co-authored by Jose Thekkiniath, published in the *Journal of Biological Chemistry*.

More information: Amanah Abraham et al. Establishment of a continuous in vitro culture of *Babesia duncani* in human erythrocytes

reveals unusually high tolerance to recommended therapies, *Journal of Biological Chemistry* (2018). [DOI: 10.1074/jbc.AC118.005771](https://doi.org/10.1074/jbc.AC118.005771)

Provided by Yale University

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