

## **Borrelia burgdorferi activates human astrocytes cells in culture**

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According to the authors, “If uncontrolled in the context of neuroborreliosis, the astrocyte response could lead to long-term injury in the CNS.”

Credit: MicroRNA and mRNA Transcriptome Profiling in Primary Human Astrocytes Infected with *Borrelia burgdorferi*, PLoS One, Timothy Casselli et al.

Researchers identified changes in gene expression within 48 hours of infecting cultured astrocytes with *Borrelia burgdorferi* (*Bb*). “Understanding how these changes are maintained over time will be of great importance in developing effective treatments to Lyme disease,” [according to Casselli and colleagues](#) from the Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences. “If uncontrolled in the context of neuroborreliosis, the astrocyte response could lead to long-term injury in the CNS.” [1]

The study offers further insight into the role of *Bb* in neurocognitive changes in Lyme disease. “The pathophysiology behind the neurocognitive complaints of Lyme disease is unclear, but the inflammatory response to the bacterium or its components is likely to play a role,” according to Casselli. The authors also cited elevated serum IFN- $\gamma$  levels in patients with a history of Lyme disease and objective memory impairment [2] and apoptosis of neurons when human glia cells are stimulated with *Bb*. [3]

### References:

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2. Jacek E, Fallon BA, Chandra A, Crow MK, Wormser GP, Alaedini A: Increased IFN $\alpha$  activity and differential antibody response in patients with a history of Lyme disease and persistent cognitive deficits. J Neuroimmunol 2012.
3. Parthasarathy G, Fevrier HB, Philipp MT: Non-viable *Borrelia burgdorferi* induce inflammatory mediators and apoptosis in human oligodendrocytes. Neurosci Lett 2013, 556:200-203.

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