

Lyme Bacteria Hides Inside Parasitic Worms, Causing Chronic Brain Diseases

Recent discovery confirmed by state-of-the-art Molecular Beacon DNA probes

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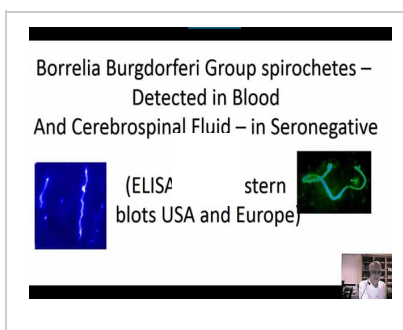
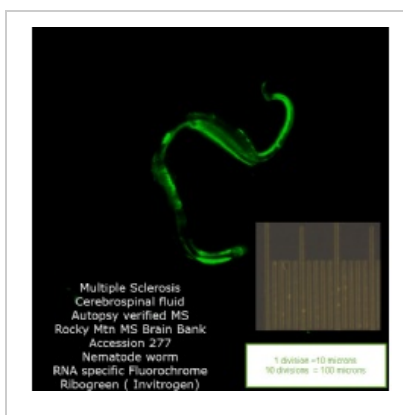
The examination of autopsied brain tissues from patients who died of serious neurological conditions has revealed that many tick-borne infections, such as Lyme disease, go undiagnosed and untreated. Board-certified pathologist, Alan B. MacDonald, MD, says his research shows “tick infections are not easily detected with routine tests, nor are they easily cured with short courses of antibiotics.”

MacDonald will present his findings Thursday on Capitol Hill, in the Rayburn House Office Building, at a forum to explore the scientific, economic, and policy challenges posed by the epidemic of Lyme disease and associated tick-borne illnesses.

MacDonald found two *Borrelia* pathogens, including *B. burgdorferi* the causative agent of Lyme disease, thriving inside parasitic nematode worms, worm eggs or larvae in the brain tissue of nineteen deceased patients. These microscopic worms are endosymbionts, meaning the *Borrelia* bacteria dwell inside the worms. A tick bite delivers the nematode into the human body.

“Both the worms and the *Borrelia* pathogens can cause devastating brain damage,” said MacDonald. “Current tests, like the ELISA and Western blot, do not adequately detect the presence of *Borrelia* bacteria.” MacDonald says his discovery also shows “while patients are wrongly declared free of Lyme and other tick-borne infections, in reality, too often they contract serious neurodegenerative diseases which can kill them.”

The [Rocky Mountain Multiple Sclerosis Center Tissue Bank](#) provided MacDonald with ten specimens from deceased MS patients; all ten specimens showed evidence of *Borrelia* infected nematodes. Infected worms were also found in five tissue specimens from patients who succumbed to the highly malignant brain tumor Glioblastoma multiforme, the same cancer which took the life of Senator Edward Kennedy (D-MA). Ironically, in 1993, Senator Kennedy chaired a hearing of the Labor and Human Resources committee titled: [Lyme disease: A Diagnostic and Treatment Dilemma](#). Finally, four specimens from patients who died from Lewy Body dementia, the same illness which afflicted comedian [Robin Williams](#), also showed the presence of infected nematodes.



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MacDonald's work breaks new ground while building on previous studies. In 1984, Lyme pioneer Willy Burgdorfer, Ph.D. [wrote](#) of finding nematodes in tick guts. In 2014, University of New Haven researcher [Eva Sapi, Ph.D.](#), examined the guts of ticks gathered in southern Connecticut and found 22% of the nymphs and 30% of adult Ixodes ticks carried nematodes in their systems.

MacDonald identified the infected nematodes using a technique known as FISH: Fluorescent In Situ Hybridization which involves using molecular beacon DNA probes. FISH identifies pieces of *Borrelia*'s genetic material which fluoresce under the microscope with a 100% DNA match. Dr. MacDonald, a fellow of the [Academy of American Pathologists](#), conducts his research through the Dr. Paul Duray Research Fellowship Endowment Inc. MacDonald's presentation can be accessed here: <https://vimeo.com/166688480>.

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