Peer Reviewed Evidence of Persistence of Lyme Disease Spirochete *Borrelia burgdorferi* and Tick-Borne Diseases

The following is a list of over 700 peer reviewed articles that support the evidence of persistence of Lyme and other tick-borne diseases. It is organized into different categories—general, psychiatric, dementia, autism and congenital transmission.

**General: Persistence of Lyme Disease Spirochete *Borrelia burgdorferi***

The following section of references for persistence of Lyme disease (Lyme borreliosis) are listed alphabetically and chronologically:

1. Aalto A, Sjowall J, Davidsson L, Forsberg P, Smedby O. Brain magnetic resonance imaging does not contribute to the diagnosis of chronic neuroborreliosis. Acta Radiol 2007; 48: 755-762. [white matter hyperintensities or basal ganglia lesions].
21. Bayer ME, Zhang L, Bayer MH. *Borrelia burgdorferi* DNA in the urine of treated patients with chronic Lyme disease symptoms. A PCR study of 97 cases. Infection 1996; 24: 347-353. [97 patients who had been treated with antibiotics for extended periods of time and had symptoms of chronic Lyme were PCR-positive.]


Chmielewski T, Tylewlska-Wierzhanowska S. Inhibition of fibroblast apoptosis by *Borrelia burgdorferi* in vitro. Infection. 1998; 26: 144-150. [change in physical characteristics; change of spirochetes to other pleomorphic forms, i.e., cell wall deficient forms, namely cysts.]

Brorson O and Brorson S-H. Transformation of cystic forms of *Borrelia burgdorferi* to normal mobile spirochetes. Infection. 1997; 25: 240-246. [change in physical characteristics; change of spirochetes to other pleomorphic forms, i.e., cell wall deficient forms, namely cysts.]
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Phillippi-Falkenstein, JE Purcell, MS Ratterree, and MT Philipp (2012) Persistence of culture in rhesus macaques following antibiotic treatment of disseminated infection. PLoS ONE 7(1): e29914. doi:10.1371/journal.pone.0029914 [Bb was cultured from rhesus macaques after antibiotic treatment and confirmed by PCR.]

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Datta-Purcell, MS Ratterree, and MT Philipp (2012) Persistence of culture in rhesus macaques following antibiotic treatment of disseminated infection. PLoS ONE 7(1): e29914. doi:10.1371/journal.pone.0029914 [Bb was cultured from rhesus macaques after antibiotic treatment and confirmed by PCR.]

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"treatment with minocycline in a patient with persisting"

"Liegner KB, Shapiro JR, Ramsay D, Halperin AJ, Hogrefe W, and Kong L. Recurrent erythema migrans despite extended antibiotic"


"Eleven months following treatment, T-cell stimulation test with Bb antigens were strongly positive; a year later, paired serum and"

"CSF samples were strongly positive."

Microbiologica 2014; 37: 393-397. [Bb in brain]

B. garinii


Masters EL, Lynxwiler P, and Rawlings J. Spirochetemia after continuous high-dose oral amoxicillin therapy. Infect Dis Clin Practice 1995; 3: 207-208. [Following six months of treatment, patient relapsed and Bb was cultured from blood.]


230. Miklossy, J. 2011. Alzheimer’s disease – a neurospirochetosis. Analysis of the evidence following Koch’s and Hill’s criteria. 2011; 8: 90 [http://www.jneuroinflammation.com/content/8/1/90] [91% of the brains of Alzheimer’s patients sampled were positive for spirochetes; 25% of Alzheimer’s patients analyzed had B. burgdorferi spirochetes in their brains. Persistence occurs when spirochetes change physical characteristics by converting to dormant cysts.]

231. Miklossy J (2012) Chronic or late Lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. Open Neurol J (Suppl 1-M11) 6: 179-186. [Bb damages collagen and elastic fibres in ligaments and tendons, and weakens connective tissue, including ruptures of tendons, and prolapsed intervertebral discs.]


223. Oksi J, Marjamäki M, Nikoskelainen J, and Viljanen MK. Borrelia burgdorferi detected by culture and PCR in clinical relapse of disseminated Lyme borreliosis. Ann Med 1999; 31(3): 225-232. [40% (13/32) patients had clinical relapses that were PCR or culture-confirmed.]


234. Pfister HW, Preac Mursic V, Wilsk B, Schieltz E, Sorgel F, Einhaupl KJM. Randomized comparison of ceftriaxone and cefotaxime in Lyme neuroborreliosis. Infect Dis 1991; 163(2): 311-318. [In one patient, Bb was isolated from the cerebrospinal fluid 7.5 months after ceftriaxone therapy and, thus, showing that extended therapy is necessary.]


Yrjänäinen H, Borrelia burgdorferi evades the effects of ceftriaxone treatment in mouse model. Medica Odontologica 2009 [thesis]


Psychiatric Symptoms and Lyme/Tick-Borne Diseases

This section is organized alphabetically by the title of the article.


The association between tick-borne infections, Lyme borreliosis and autism spectrum disorders AUTHORS: Bransfield RC, Wulfman JS, Harvey WT, Usman AI. SOURCE: Medical Hypotheses. 5 Nov 2007


Chronic or late lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. AUTHORS: Miklossy J. SOURCE: Open Neurol J 2012; 6: 146-57.


Epidemiologic, clinical, and laboratory findings of human ehrlichiosis in the United States, 1988. SOURCE:


Human babesiosis—an unrecorded reality. **AUTHOR:** Sherr VT. **SOURCE:** Med Hypotheses. 2004;63(4):609-15


Inflammation in the pathogenesis of Lyme neuroborreliosis. **AUTHORS:** Jacobs MB, Philipp MT. **SOURCE:** Am J Pathol. 2015 May;185(5):1344-60.

Inflammatory changes in Lyme Borreliosis. A report on three patients and review of literature; **AUTHORS:** Oksi J, Kalimo H, Marttila RJ, Marjarnaki M, Sonninen P, Nikoskelainen J, VILJANEN MK. **SOURCE:** Brain, 1996 Dec; 119 (Pt 6) : 2143-2154


Inflammatory Agents in Schizophrenia and Bipolar Disorder. **AUTHORS:** Yolken RH, Torrey EF, **SOURCE:** 2006 June 43(7)


Lyme Disease: A Neuropsychiatric Illness


Interaction of the Lyme Disease Spirochete Borrelia burgdorferi with Brain Parenchyma Elicits Inflammatory Mediators from Glial Cells as Well as Glial and Neuronal Apoptosis **AUTHORS**: Marjarnaki M, Sonninen P, Nikoskelainen J, VILJANEN MK: 


**Loss of the sense of humor** **AUTHOR**: Ramanan SV. **SOURCE**: Arch Intern Med 2000 Sep 11;160(16):2546


Multiple neurologic manifestations of Borrelia burgdorferi infection. AUTHORS: Dupuis MJ. SOURCE: Rev Neurol (Paris) 1998;144(12):765-75 [French]


Neuroborreliosis. AUTHOR: Kaiser B. J Neurol (1998); 245:247-255


Neuropsychiatric Aspects of Non-HIV Infectious Diseases. AUTHORS: Maud C, Berk M. SOURCE: Psychiatric Times, June 2004


Pain, fatigue, depression after borreliosis. Antibiotics used up—what next?


PET imaging of microglia activation in neuropsychiatric disorders with potential infectious origin. AUTHORS: Klein HC, de Witte L, Bransfield RC, De Deyn PP SOURCE: In Print. 2014. Copyright Holder Springer-Verlag Berlin Heidelberg


SPECT Brain Imaging in Chronic Lyme Disease. AUTHORS: Donsta ST, Noto RB, Vento JA. SOURCE: Clinical Nuclear Medicine & Volume 37, Number 9, September 2012

The association of lyme disease with loss of sexual libido and the role of urinary bladder detrusor dysfunction. AUTHORS: Journal, The Relationship between Tourette's Syndrome and Infections


Tick-borne infections--a growing public health threat to school-age children. Prevention steps that school personnel can take. AUTHOR: Hamlen R. SOURCE: NASN Sch Nurse 2012(Mar); 27(2): 94-100. http://nas.sagepub.com/content/27/2/94


Tick-borne infections--a growing public health threat to school-age children. Prevention steps that school personnel can take. AUTHOR: Hamlen R. SOURCE: NASN Sch Nurse 2012(Mar); 27(2): 94-100. http://nas.sagepub.com/content/27/2/94


Additional Articles:

Aggression and Lyme Disease, Bransfield R.
All In Your Head?, Bransfield R.
A Tale of Two Spirochetes, Bransfield R.
Lyme Disease and Cognitive Impairments, Bransfield R.
Lyme, Depression, and Suicide, Bransfield R.
Lyme Neuroborreliosis and Aggression, Bransfield RC.
14th International Scientific Conference on Lyme Disease and Other Tick-Borne Disorder. April 21-23, 2001
Microbes and Mental Illness, Bransfield R.
Posttraumatic Stress Disorder and Infectious Encephalopathies, Bransfield R.
Sex and Lyme Disease, Bransfield R.
Spirochetes on the Brain, Bransfield R.
The Klemptner Article, Bransfield R. Brand R.

The Neuropsychiatric Assessment of Lyme Disease. Bransfield R.
The Psychotropic Management of Late-Stage Lyme and Associated Diseases. Bransfield R.

What Causes Illness and Mental Illness? Bransfield R.

Some of the above references and additional articles are also listed online at:
Neuropsychiatric Lyme Disease Online Resources: http://www.lymeinfo.net/neuropsych.html

And Cavete Diagnosen (Cavete, lat.: hüet euch davor, d.h. hier: vor diesen Diagnosen): http://www.erlebnishaft.de/cavete_diagnosen.pdf
http://www.erlebnishaft.de/kommentalternativ.pdf
Compiled by Robert Bransfield, MD, DLFAPA, Rutgers, RWJ Medical School, September 2015

Tick-Borne Diseases and Dementia

This list is organized by date.

• MacDonald AB. Plaques of Alzheimer's disease originate from cysts of Borrelia burgdorferi, the Lyme disease spirochete. Med Hypotheses. 2006;67(3):592-600.
• Miklossy J. (2012) Chronic or late lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. Open Neurol J. 6, 146-57

Compiled by Robert Bransfield, MD, DLFAPA, Rutgers-RWJ Medical School, July 2015.

Tick-Borne Disease and Autism Spectrum Disorders

• Bransfield RC. Preventable cases of autism: relationship between chronic infectious diseases and neurological outcome Pediatric Health. 3(2):125-140. (2009)

Compiled by Robert Bransfield, MD, DLFAPA, Rutgers, RWJ Medical School, July 2015

Congenital Transmission of Lyme/TBD
