



International Symposium on Tick-Borne Pathogens and Disease

**ITPD 2019 Vienna, Austria
8 to 11 September 2019**

Under the auspices of the Austrian Society for Hygiene,
Microbiology and Preventive Medicine (ÖGHMP)

Organisers

ÖGHMP and ESGBOR

Venue

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Preliminary Programme



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Austrian Society for Hygiene, Microbiology and
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ESCMID Study Group for Lyme Borreliosis



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Complement-mediated serum susceptibility of *Borrelia burgdorferi sensu lato* strains from Serbia

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Lyme borreliosis, the most common tick-borne disease in Eurasia and North America, is caused by spirochetes of *Borrelia burgdorferi sensu lato* complex. *Borrelia* strains exhibit different pathogenicity even within the same species and innate immunity of a host plays an essential role in the recognition, discrimination, and elimination of invading microorganisms. Since host specificity of *Borrelia* is dependent on resistance to host complement, we were interested in susceptibility of different *Borrelia* strains (five *Borrelia lusitaniae*, three *Borrelia garinii*, two *Borrelia afzelii*, two *Borrelia bavariensis*, and two *Borrelia valaisiana*) isolated from *Ixodes ricinus* ticks from Serbia, to human complement.

The direct killing assay was used to investigate the susceptibility of *Borrelia* strains, *in vitro*. Strains were cultured until they reached 10^6 cells/mL. Serum samples were pooled for normal human serum (NHS) while heat-inactivated serum (HIS) was generated by incubating NHS at 56°C for 45 min. The equal volumes of strain culture and NHS or HIS were mixed in microtiter plates and incubated at 33°C for 1 and 3 h. After incubation, samples were examined by dark-field microscopy and 100 *Borrelia* per well were scored as motile or immotile. Loss of motility and extent of blebbing of *Borrelia* in NHS compared to HIS was indicative of complement-mediated killing and inactivation of *Borrelia*.

After 3 h of incubation, 2/2 *B. afzelii*, 2/2 *B. bavariensis*, and 1/3 *B. garinii* strains were motile (98.4-100% motility), 5/5 *B. lusitaniae* and 2/3 *B. garinii* strains were mostly immotile (0-5.2% motility), while two *B. valaisiana* strains were motile (82.5% and 64.3%).

This study is the first report on *in vitro* susceptibility of local *Borrelia* strains to human serum and shows differences in susceptibility among various isolates. Since there is no data on *Borrelia* species infecting humans in Serbia, our results point toward a pathogenic potential of local *Borrelia* strains.