

Borrelia spp. Antigens

Lyme disease is the most common tick-borne disease in the northern hemisphere, caused by *Borrelia* spp. Even though Lyme disease was originally identified in the town of Lyme, Connecticut (USA) in the mid 1970s, prospective studies revealed an earlier history in untreated European patients (Borchers *et al.* 2015). The various clinical manifestations include flu-like symptoms and a characteristic circular skin rash called erythema migrans (EM).

Even though more abundant in the United States the total number of annual cases of Lyme Disease in Europe is estimated to be approximately 3-fold higher than the number of reported cases. Climate changes with a subsequent expansion of vector tick territory, along with changes in land use might affect changes in epidemiology of Lyme Disease and other tick-borne infections in the future (Andersen and Davis 2016).

The complex endozoonotic cycle of *Borrelia* spp. in Europe usually involves transmission to a broad range of vertebrates by infected ticks of the species *Ixodes ricinus* (Rizzoli *et al.* 2011). Due to the presence of different ecotypes within the species and utilization of different

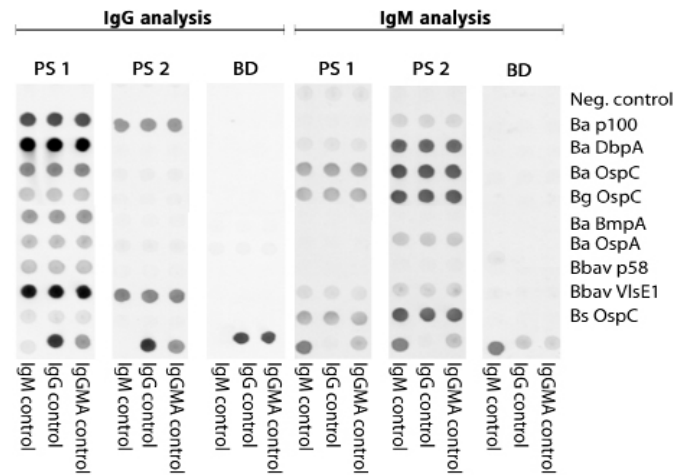


Figure: Immunodot analyses of positive (PS1, PS2) and negative (BD) samples for *Borrelia afzelii* (Ba), *B. bavariensis* (Bbav), *B. garinii* (Bg), *B. spielmanii* (Bs). The presence of IgG (left) and IgM (right) antibodies was determined spotting triplicates of recombinant DIARECT antigens derived from *Borrelia* spp. on nitrocellulose membrane.

host reservoirs, Margos *et al.* (2009) analyzed intra- and interspecific relationships by multilocus sequence analysis (MLSA). Apart from *B. garinii* and *B. bavariensis*, cases in Europe can be caused by *B. afzelii*, *B. spielmanii*, and *B. burgdorferi* sensu stricto. Similar immunogenic proteins of *Borrelia* species are associated in US and European cases. Especially outer surface proteins A and C (OspA, OspC), and variable major protein-like sequence expressed 1 (VlsE1) appear to be important for infection and immune evasion. Basic membrane protein A (BmpA) serves as adhesin for binding to the host cell. Further immunogens are p58 and p100, whose cellular functions and pathogenic implications have not been clarified yet. The most sensitive protein for IgG antibody detection in all stages of Lyme disease was found to be VlsE1 followed by p100 and p58 (Goettner *et al.* 2005).

The DIARECT's recombinant *Borrelia* spp. antigens are expressed in either *E. coli* or the baculovirus/insect cell expression system.

References:

- Andersen and Davis (2016) Int J Dermatol. 33: 2358-2365
- Borchers *et al.* (2015) J Autoimmun. 57: 82-115
- Goettner *et al.* (2005) J Clinical Microbio. 43: 3602-3609
- Margos *et al.* (2009) Appl Environ Microb. 75: 5410-5416
- Rizzoli *et al.* (2011) Euro Surveill. 16: pii 19906

In some countries the use of certain antigens in diagnostic tests may be protected by patents. DIARECT is not responsible for the determination of these issues and suggests clarification prior to use.

Ordering Information

41100	<i>Borrelia afzelii</i> BmpA	0.1 mg
41101		1.0 mg
40900	<i>Borrelia afzelii</i> DbpA	0.1 mg
40901		1.0 mg
41000	<i>Borrelia afzelii</i> OspA	0.1 mg
41001		1.0 mg
41800	<i>Borrelia afzelii</i> OspC	0.1 mg
41801		1.0 mg
42300	<i>Borrelia afzelii</i> p100	0.1 mg
42301		1.0 mg
42700	<i>Borrelia bavariensis</i> DbpA	0.1 mg
42701		1.0 mg
40700	<i>Borrelia bavariensis</i> p58	0.1 mg
40701		1.0 mg
41400	<i>Borrelia bavariensis</i> VlsE1	0.1 mg
41401		1.0 mg
42800	<i>Borrelia garinii</i> DbpA	0.1 mg
42801		1.0 mg
41900	<i>Borrelia garinii</i> OspC	0.1 mg
41901		1.0 mg
42900	<i>Borrelia spielmanii</i> DbpA	0.1 mg
42901		1.0 mg
40800	<i>Borrelia spielmanii</i> OspC	0.1 mg
40801		1.0 mg

210414_Rev05

