Recombinant Borrelia burgdorferi sensu stricto (B31) DbpA Protein, MBP-tagged

Cat. No. BOR-037 **Lot. No.** (See product label)

SPECIFICATION

Product Overview	Recombinant Borrelia burgdorferi DbpA protein is fused to an MBP-tag and produced in E. coli (>90% purity). Strain B31 is the type strain (ATCC 35210) for this organism and was derived by limited dilutional cloning from the original Lyme-disease tick isolate obtained by A. Barbour.
Tag	MBP
Background	B. burgdorferi sensu stricto has a linear plasmid (lp54) which carries a two-gene operon encoding two surface lipoproteins, DbpA and DbpB, both of which bind Decorin Binding Protein A (DbpA). It should be noted that other microbial DbpA's, such as E. coli (ATP-dependent RNA helicase DbpA), are significantly different to Borrelia DbpA (Guo, et al., 1995). DbpA and DbpB are surface-exposed outer membrane lipoproteins that mediate the attachment of Borrelia to decorin, a major component of the host extracellular matrix, enabling bacteria to colonize mammalian tissues (Roberts, et al., 1998). Both can mediate interaction with the glycosaminoglycans (GAGs) heparin and dermatan sulfate (Guo, et al., 1998), but only DbpB binds chondroitin sulfate (Fischer, et al., 2003). The spirochete travels from the tick mid-gut during tick feeding, to the tick salivary glands and into the mammal host, and it is believed that this migration is facilitated by changes in expression of different B. burgdorferi genes. It is thought that expression of the various proteins associated with the spirochete may be regulated by the changes in tick life cycle, changes in conditions during tick feeding (such as

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	temperature, pH, and nutrients) and/or in coordination with the course of infection of the mammal host. While not expressed in the unfed tick, DbpA (and possibly DbpB) are quickly upregulated, either during feeding or after entry, into the host. The location of DbpA and DbpB in the outer membrane of B. burgdorferi allows exposure of these proteins to the host immune system. DbpA has also been used to show high levels of genetic diversity in B. afzelii-infected rodent hosts, by qPCR (Coipan, et al., 2018). NMR and a crystal structure of a DbpA monomer (resolution of 1.60 Å) confirmed three lysines co-localize with decorin to a common basic patch near the C terminus of the protein (Wang & Feng, 2015; Fortune, et al., 2014). Knockout strains confirmed that the lysine residues are required for binding and infection in mice (Fortune, et al., 2014). Strain-specific variations of Borrelia surface proteins also affect tissue tropism (Lin, et al., 2014) as well as differences in GAG binding affinities which is correlated with differences in GAG-binding pocket location and epitope number (Morgan & Wang, 2015).
Purity	>90% by SDS-PAGE
Formulation	0.02 M Potassium Phosphate, 0.15 M Sodium Chloride, pH 7.2 and 0.01% (w/v) Sodium Azide
Stability	At +4 centigrade: Not determined. At -80 centigrade: Not determined.
Freezing	Can be frozen, but avoid multiple freeze/thaw cycles.
Storage	Short Term Storage: +2 centigrade to +8 centigrade Long Term Storage: -80 centigrade
Concentration	1.0 mg/mL by UV absorbance at 280 nm

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Notes	This product is intended for research and manufacturing uses only. It is not a diagnostic device. The user assumes all responsibility for care, custody and control of the material, including its disposal, in accordance with all regulations.
Type	Recombinant
ClassID 1	Infectious Disease

GENE INFORMATION

Synonyms	Borrelia burgdorferi sensu stricto (B31) DbpA

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