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Datasheet for 000-001-C17

p39 Control Protein

Overview

Description:	p39 Control Protein - 000-001-C17
Item No.:	000-001-C17
Size:	100 µg
Applications:	SDS-PAGE, WB, Biochemical Assay
Origin:	Borrelia burgdorferi
Expressed in:	E. coli

Product Details

Background:	The p39 protein, or Basic membrane protein A, is one of the immunogenic cell membrane components of Borrelia burgdorferi, the spirochete carried by Ixodes ticks. The spirochete migrates from the tick midgut during feeding to its salivary glands and are thus transmitted to the mammal host. This transition may be facilitated by changes in expression of some B. burgdorferi genes. It is believed 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 temperature, pH, and nutrients) and/or in coordination with the course of infection of the mammal host. BmpA is expressed during the invasion of the spirochete and in the evolution of the arthritis of Lyme disease in mammals. It belongs to the BMP lipoprotein family. The major products of the B. burgdorferi basic membrane protein (bmp) A/B operon that are induced in murine and human joints possess inflammatory properties. Non-lipidated and lipidated versions of BmpA have been shown to induce the pro-inflammatory cytokine TNF-α and IL-1ß in human synovial cells. The induction of cytokine responses in synovial cells via activation of the NF-kappaB and p38 MAP kinase pathways could potentially contribute to the genesis of Lyme arthritis. The BmpA outer-surface protein is an important antigen for serodiagnosis of human infection. B. burgdorferi adheres to host extracellular matrix components, including laminin, but may not bind mammalian type I or type IV collagens or fibronectin. Lyme disease proteins are ideal for researchers interested in immunology, neurology, rheumatology, coinfections, autoimmune, and neurodegenerative diseases.
Synonyms:	Basic membrane protein A, Borrelia burgdorferi bmpA, immunodominant antigen P39, membrane lipoprotein BmpA, control protein
Species of Origin:	Borrelia burgdorferi
Expressed in:	E. coli

Type:	Recombinant Protein

Target Details

Gene Name:	bmpA, BB_0383
Purity/Specificity:	p39 is a fusion protein with an MBP tag and was expressed in E. coli. Analysis by SDS-PAGE resulted in a pattern consistent with purified p39 and was estimated to be greater than 90% pure.
Relevant Links:	• UniProtKB - Q45010 • NCBI - WP_002656850.1 • GeneID - 1195220

Application Details

Tested Applications:	SDS-PAGE, WB
Suggested Applications:	Biochemical Assay (Based on references)
Application Note:	p39 is suitable as a control in immunological assays. Specific conditions for reactivity should be optimized by the end user. Expect a band at 77.8 kDa for p39-MBP, (35.4 kDa for p39 and 42.4 kDa for MBP) in size corresponding to p39 by Western blotting in the appropriate cell lysate or extract. p39 protein was tested in SDS-page and western blot.
Assay Dilutions:	All assays should be optimized by the user. Recommended dilutions (if any) may be listed below.
ELISA:	User Optimized
WB:	User Optimized

Formulation

Physical State:	Liquid (sterile filtered)
Concentration:	0.994mg/mL by BCA assay
Buffer:	0.02 M Potassium Phosphate, 0.15 M Sodium Chloride, pH 7.2
Preservative:	0.01% (w/v) Sodium Azide
Stabilizer:	None

Shipping & Handling

Shipping Condition:	Dry Ice
Storage Condition:	Store vial at -20 °C prior to opening. Aliquot contents and freeze at -20 °C or below for extended storage. Avoid cycles of freezing and thawing. Centrifuge product if not completely clear after standing at room temperature. Dilute only prior to immediate use.
Expiration:	Expiration date is six (6) months from date of receipt.

Images

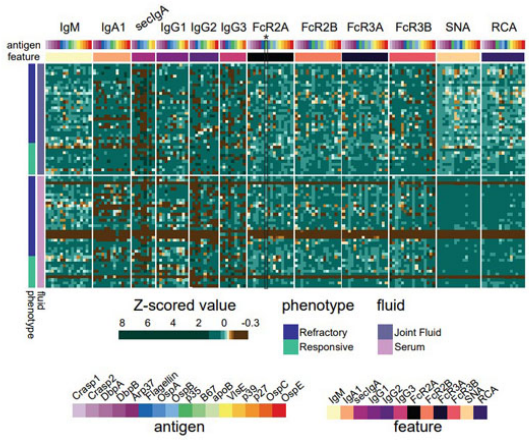


Figure
Systems serology profiling with Borrelia-specific antigens reveals patient heterogeneity. The heatmap shows the Z-scored measurements for 12 features, across 16 antigens for both refractory and responsive patients, visualized with joint fluid measurements in the upper half of the heatmap and serum measurements in the lower half of the heatmap. Only antigens detected above background for at least 30% of samples were included for each measurement. Statistical significance was assessed using the Mann-Whitney nonparametric test, with p values then corrected for multiple hypothesis testing via Benjamini-Hochburg, *p < 0.05, **p < 0.01, ***p < 0.001, else not significant. CRASP1 (p/n 000-001-C18), CRASP2 (p/n 000-001-C19), DbpA (p/n 000-001-B98), DbpB (p/n 000-001-C16), Arp37 (p/n 000-001-C09), flagellin (p/n 000-001-C14), OspA (p/n 000-001-C13), OspB (p/n 000-001-C15), OspC (p/n 000-001-C11), OspE (p/n 000-001-C10), p27 (p/n 000-001-C30), p35 (p/n 000-001-C12), p39 (p/n 000-001-C17), VlsE (p/n 000-001-C33). Fig 1. PMID: 38303696.

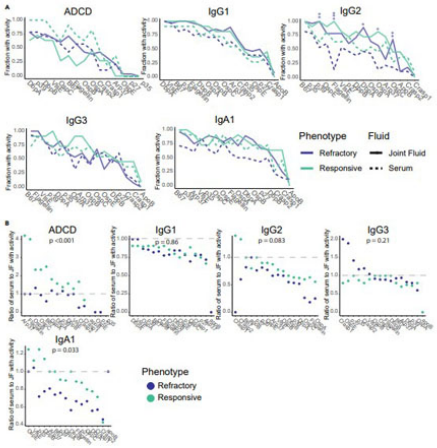
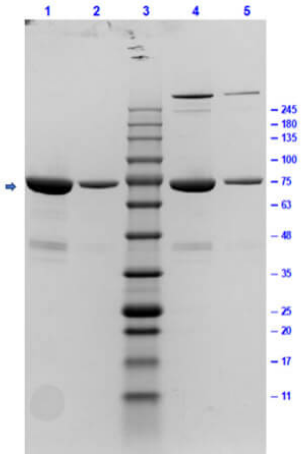
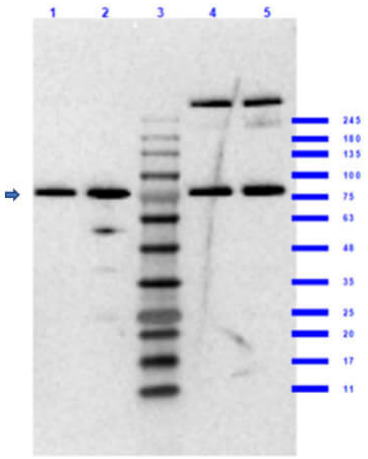


Figure
Antigen-specific IgG2, IgA1, and ADCD partitioning between compartments differs significantly across disease phenotypes. (A) Fraction of samples with non-zero measurements for ADCD, IgG1, IgG2, IgG3, and IgA1 for refractory (dark blue) and responsive (green) patients in the serum (dashed line) and joint fluid (solid line) for each antigen. Significant differences in distribution of non-zero measurements between fluids as assessed by a Fisher's exact test are denoted as *p < 0.05, **p < 0.01, ***p < 0.001 for refractory (dark blue) and responsive (green) samples after correction for multiple hypothesis testing via Benjamini-Hochburg. (B) Ratio of fraction of serum samples with non-zero measurements to fraction of joint fluid samples with non-zero measurements for ADCD, IgG1, IgG2, IgG3, and IgA1 for refractory (dark blue) and responsive (green) patients for each antigen. Significant differences in distributions of ratios between phenotypes are assessed by a Mann-Whitney nonparametric test, then corrected for multiple hypothesis testing via Benjamini-Hochburg. CRASP1, CRASP2, DbpA, DbpB, Arp37, flagellin, OspA, OspB, OspC, OspE, p27, p35, p39, VlsE: Rockland antigens. Fig 6. PMID: 38303696.



SDS-PAGE
SDS-PAGE Results of p35 Control Protein. Lane 1: p39 Control Protein Reduced [5.0µg]. Lane 2: p39 Control Protein Reduced [1.0µg]. Lane 3: Opal Prestained Molecular Weight Marker (p/n MB-210-0500). Lane 4: p39 Control Protein Non-Reduced [5.0µg]. Lane 5: p39 Control Protein Non-Reduced [1.0µg]. 4-20% gel, Coomassie stained. Expected MW of p39-MBP ~77.8kDa.



Western Blot
Western Blot of p35 Control Protein. Lane 1: p39 Control Protein (p/n 000-001-C17) Reduced [0.1µg]. Lane 2: p39 Control Protein (p/n 000-001-C17) Reduced [0.2µg]. Lane 3: Opal Prestained Molecular Weight Marker (p/n MB-210-0500). Lane 4: p39 Control Protein (p/n 000-001-C17) Non-Reduced [0.1µg]. Lane 5: p39 Control Protein (p/n 000-001-C17) Non-Reduced [0.2µg]. Primary Antibody: Anti-p39 (p/n 200-401-C17) at 1:1000 overnight at 2-8°C. Secondary Antibody: Goat anti-Rabbit IgG [H&L] HRP (p/n 611-1302) at 1:40,000 for 30mins at RT. Blocking: BlockOut Buffer (MB-073) for 1hr RT. Expected MW: 77.8kDa. Exp: 10sec.

References

- Bowman KA. et al. Borrelia-specific antibody profiles and complement deposition in joint fluid distinguish antibiotic-refractory from -responsive Lyme arthritis. *iScience.* (2024)

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