

Datasheet for 000-001-C12**p35 Control Protein****Overview**

Description:	p35 Control Protein - 000-001-C12
Item No.:	000-001-C12
Size:	100 µg
Applications:	SDS-PAGE, WB, Biochemical Assay
Origin:	Borrelia burgdorferi
Expressed in:	E. coli

Product Details**Background:**

The p35 kDa protein of the spirochete *Borrelia burgdorferi* is being investigated for use as an early diagnostic marker of Lyme Disease. *Borrelia* may change its antigenic composition in its need for adaptation to stresses imposed by changes in conditions from cycling between its arthropod and mammalian hosts. This group of *B. burgdorferi* proteins may be induced in the tick midgut during the feeding event. The p35 protein elicits a protective immunity from wild type *B. burgdorferi*. It has been shown that p35 expression in *B. burgdorferi* is upregulated in the stationary growth phase, and that a temperature of 34°C but not 24°C influenced the expression. The expression of a majority of the proteins expressed in early Lyme disease is affected pH, being abundantly expressed at pH 7.0 (resembling the tick midgut pH of 6.8 during feeding) but only sparsely at pH 8.0 (a condition closer to that of the unfed tick midgut pH of 7.4). The encoding genes may be coregulated. The 35-kDa antigen has been shown to be a statistically significant marker in IgG immunoblots in a study of patients with early Lyme disease who presented with erythema migrans. Recombinant p35 protein may be useful as a diagnostic reagent, especially in combination with other antigens that have been deemed relevant in serodiagnosis of early Lyme disease. Lyme disease proteins are ideal for researchers interested in immunology, neurology, rheumatology, coinfections, autoimmune, and neurodegenerative diseases.

Synonyms:	bba64, <i>Borrelia burgdorferi</i> p35, control protein
Species of Origin:	<i>Borrelia burgdorferi</i>
Expressed in:	E. coli
Type:	Recombinant Protein

Target Details

Gene Name:	BB-H32, bba64
Purity/Specificity:	p35 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 p35 and was estimated to be greater than 90% pure.
Relevant Links:	• UniProtKB - O50687 • NCBI - WP_010256558.1 • GeneID - 1194146

Application Details

Tested Applications:	SDS-PAGE, WB
Suggested Applications:	Biochemical Assay (Based on references)
Application Note:	p35 is suitable as a control in immunological assays. Specific conditions for reactivity should be optimized by the end user. Expect a band at 69.5 kDa for p35-MBP, (27.1 kDa for p35 and 42.4 kDa for MBP) in size corresponding to p35 by Western blotting in the appropriate cell lysate or extract. p35 kDa protein has been tested in SDS-PAGE and WB.
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

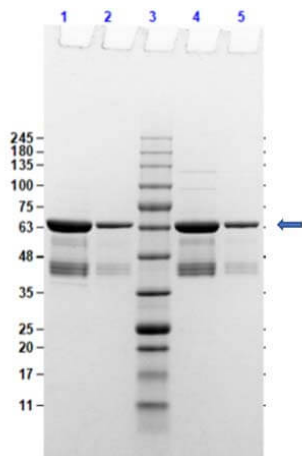
Physical State:	Liquid (sterile filtered)
Concentration:	1 mg/ml by UV absorbance at 280 nm
Buffer:	0.02 M Potassium Phosphate, 0.15 M Sodium Chloride, pH 7.2
Preservative:	0.01% (w/v) Sodium Azide
Stabilizer:	None

Shipping & Handling

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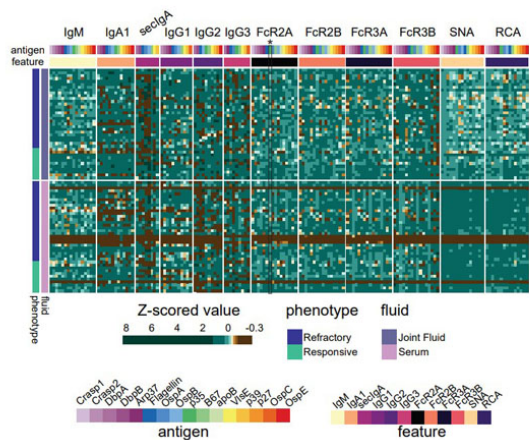
Storage Condition:	Store vial at -20 °C prior to opening. Aliquot contents and freeze at -20 °C or below for extended storage. Avoid cycles of freezing and thawing. Centrifuge product if not completely clear after standing at room temperature. Dilute only prior to immediate use.
Expiration:	Expiration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

Images



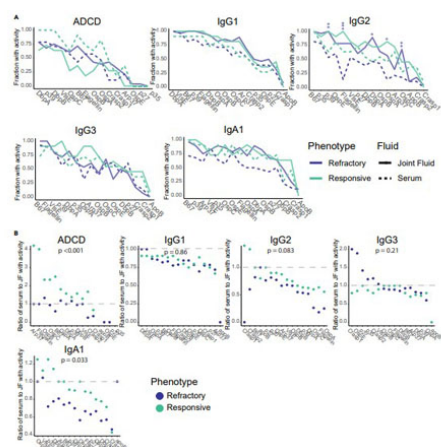
SDS-PAGE

SDS-Page results of p35 Control Protein.
Lane 1: p35 Control Protein Reduced [5µg].
Lane 2: p35 Control Protein Reduced [1µg].
Lane 3: Opal Prestained Molecular Weight Marker (p/n MB-210-0500).
Lane 4: p35 Control Protein Non-Reduced [5µg].
Lane 5: p35 Control Protein Non-Reduced [1µg].
4-25% Gel, Coomassie Stained.
p35 Control Protein is a fusion protein with MBP and the expected ~69.5kDa.



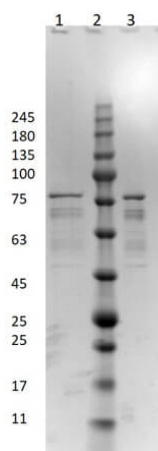
Figure

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: p35 Control Protein 1X Reduced. Lane 2: Opal Prestained Molecular Weight Marker (p/n MB-210-0500). Lane 3: p35 Control Protein 1X Non-Reduced. 4-20% Gel, Coomassie Stained.

References

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

Disclaimer

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