Recombinant multi-epitope chimeric antigen VlsE for *Borrelia burgdorferi*

CATALOG NUMBER: RAG0027 **LOT NUMBER:** #

RECOMBINANT ANTIGEN: recombinant polyepitope chimeric antigen (VlsE) for *Borrelia burgdorferi*.

DESCRIPTION: the *Borrelia burgdorferi* multi-epitope chimeric antigen VlsE has been prepared fused to a his-tag in its N-terminus. It is produced from several antigenic determinants of the variable major protein-like sequence expressed of this bacteria.

PRESENTATION: liquid protein solution

SOURCE: *Escherichia coli*

MOLECULAR WEIGHT: determined by SDS-PAGE, the protein band is between molecular markers of 45,000-35,000 Da, while relative molecular mass calculated from amino acid sequence is 36,678.82 Da.

BATCH COMPOSITION:

COMPONENTS	COMPOSITION
his- VlsE	recombinant chimeric antigen with a his-tag in its N-terminus
Storage buffer	20 mM phosphate buffer pH 7, 0.1 M KCl, and 0.1% polyoxyethylene (10) tridecyl ether

QUALITY CONTROL:

1. PROTEIN CONCENTRATION DETERMINED ESPECTROPHOTOMETRICALLY

DO_{280} = 0.52
$A_{0.1\,\%}$ (=1 g/l) = 0.341
CONCENTRATION*: 1.53 mg/ml

* The measurement of the protein concentration has been performed with the theoretical extinction coefficient of the recombinant protein obtained from Gill and vonHippel, 1989. It is recommended that the users carry out their absorbance determinations to avoid equipment variabilities regarding final concentration, mainly in reproducibility analysis.

2. PURITY CONTROL IN SDS-PAGE: 15%

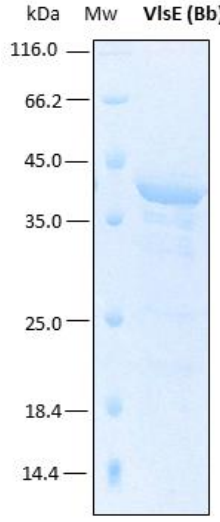

Figure 1. SDS-PAGE analysis (15%) of 2 µl of recombinant VlsE. Purity is approx. 95% as determined by gel electrophoresis.

3. TITRATION CURVE BY AN ELISA ASSAY

The titer has been suggested in reference to an "in-house" ELISA kit performed at Rekom Biotech over the first lot obtained.

Each end user should carry out their own titration for their particular application.

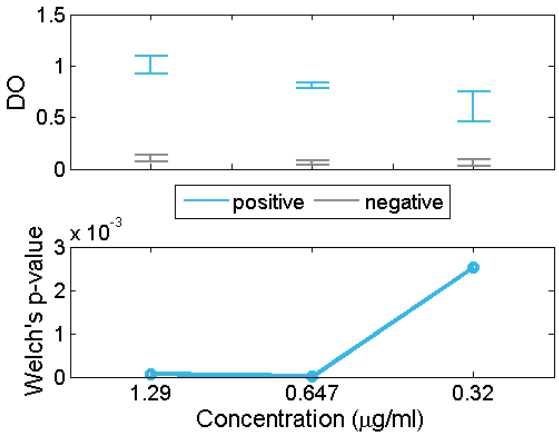

Figure 2. In this plot, the optical density at 450/620 nm for positive (blue) and negative (gray) **IgG** sera are compared for each concentration of the recombinant antigen. An appropriate statistical test of significance for the comparison of means between both groups, the Welch's test, is employed. Eligible concentrations for the use of the antigen should present statistically significant differences between positive and negative sera. This happens when the intervals at the top do not overlap and, equivalently, when the p-value at the bottom is below 0.05. In the present figure, all p-values are below 0.05 and thus the intervals do not overlap. Therefore, any of the showed concentrations can be used to distinguish between positive and negative sera.

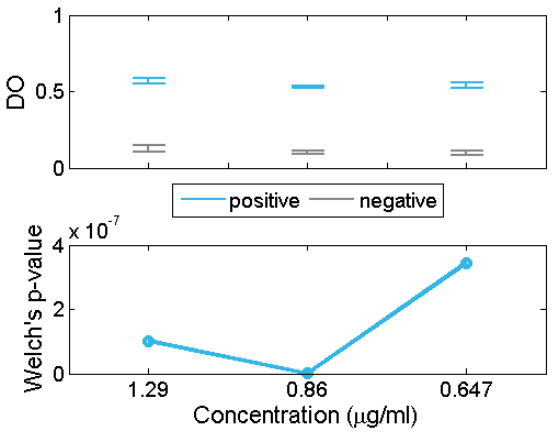

Figure 3. In this plot, the optical density at 450/620 nm for positive (blue) and negative (gray) **IgM** sera are compared for each concentration of the recombinant antigen. An appropriate statistical test of significance for the comparison of means between both groups, the Welch's test, is employed. Eligible concentrations for the use of the antigen should present statistically significant differences between positive and negative sera. This happens when the intervals at the top do not overlap and, equivalently, when the p-value at the bottom is below 0.05. In the present figure, the p-values corresponding concentrations of 5.8 and 2.32 µg/ml are below 0.05 and thus the intervals do not overlap. Therefore, any of these two concentrations can be used to distinguish between positive and negative sera.

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4. IMMUNO DOT ASSAY

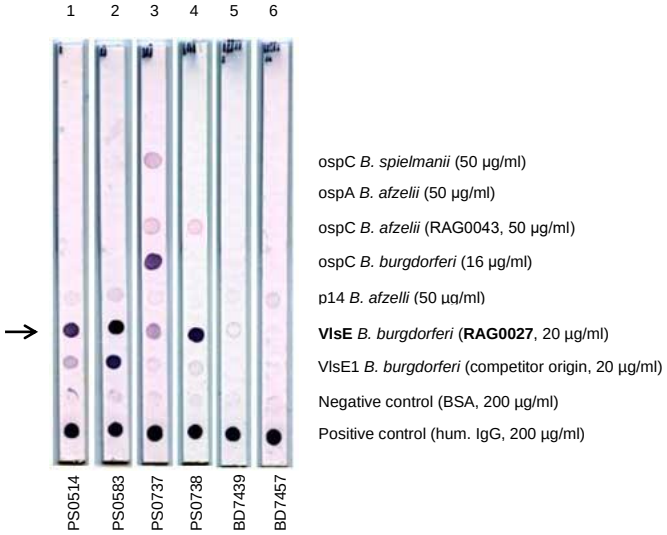

Figure 4. **Comparative study by Immuno Dot assays of different biomarkers of *Borrelia burgdorferi sensu lato***. Immuno Dot performed with positive specimen sera for Lyme disease. Positive (human IgG) and negative (BSA) control in a concentration of 200 µg/ml is used by default for all immuno dots: (1) borreliosis positive sera, (2) borreliosis positive sera, (3) borreliosis positive sera, (4) borreliosis positive sera, (5) blood donor, randomly picked from our blood donor database and (6) blood donor, randomly picked from our blood donor database.

5. ABSENCE OF PRECIPITATION AFTER A FREEZING AND THAWING CYCLE: ok

LOT SPECIFICATIONS:

1. CONCENTRATION: 1.53 mg/ml

2. TOTAL QUANTITY PER ALIQUOT: 1 mg

3. TOTAL VOLUME PER ALIQUOT: 0.686 ml

4. SUGGESTED TITER BY ELISA: up to 1:4,781, which corresponds to 0.32 µg/ml of protein in plates for IgG detection and up to 1:2,390, which corresponds to 0.64 µg/ml of protein in plates for IgM detection.

5. STORAGE: Protein is shipped with dry ice. Upon arrival, it should be aliquoted to avoid repeated freezing and thawing cycles and stored at -20ºC to -80ºC. In order to defrost the protein, maintain the aliquot at 25ºC without shaking to avoid aggregation.

6. TESTED APPLICATIONS: ELISA, IMMUNO DOT ASSAY.

7. POSIBLE APPLICATIONS: WB, DB, Indirect ELISA, positive control in direct ELISA, CLIA, lateral-flow. Where this product has not been tested for use in a particular technique, this does not necessarily exclude its use in such procedures. Suggested working dilutions are given as a guide only. It is recommended that the user titrates.

8. OBSERVATIONS: proteins should be maintained frozen at high concentrations. The dilution to be performed for ELISA assays should be made with a small quantity of protein, the same day of the experiment. In order to defrost the protein, maintain the aliquot at 25ºC without shaking to avoid aggregation. Prior making test dilutions and after defrosting the protein, is recommended to remove possible protein aggregates by centrifuging the stock solution, avoiding alterations in the immobilization of the biomolecule to the solid surface.

RELATED PRODUCTS:

Flagellin B Ba, Flagellin B Bg, Flagellin B Bb, ospC Ba, ospC Bb, ospC Bg, VlsE Bg, VlsE Ba.

BIBLIOGRAPHY:

Gill SC, von Hippel PH. Calculation of protein extinction coefficients from amino acid sequence data. *Anal Biochem.* 1989 Nov 1;182(2):319-26.

Important Notes: During shipment, small volumes of product will occasionally become entrapped in the seal of the product vial. For products with volumes of 200 µl or less, we recommend gently tapping the vial on a hard surface or briefly centrifuging the vial in a tabletop centrifuge to dislodge any liquid in the containers cap.

Although recombinant antigens are expressed in non-pathogenic *E. coli* and bacterial integrity is destroyed during purification, the antigen preparation should be handled as potentially infectious.

FOR RESEARCH AND COMMERCIAL USE *IN VITRO*: not for human *in vivo* or therapeutic use.

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