

### V 37 Functional analysis of CRASP-4 of *Borrelia burgdorferi* and its impact on complement-mediated lysis

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One virulence property of *Borrelia burgdorferi* is its resistance to innate immunity, in particular to complement-mediated killing. Serum-resistant *B. burgdorferi* express up to 5 distinct complement regulator-acquiring surface proteins (CRASPs) which interact with complement regulator factor H (CFH) and factor H-like protein 1 (FHL1) or other factor H-related proteins (CFHR).

Here, we examine the role of the CRASP-4 protein in complement resistance and its interactions with human complement regulatory proteins. To elucidate whether CRASP-4 interacts with various human proteins, purified CRASP-4 was immobilized on magnetic beads. Followed by incubation with human serum, bound proteins were eluted, separated by SDS-PAGE, transferred to a nitrocellulose, and subsequently identified by specific antibodies raised against CFH or CFHRs. CFH, CFHR1 as well as CFHR2 could be identified as ligands for recombinant CRASP-4.

To analyse the impact of CRASP-4 to complement resistance, a serum-sensitive *B. garinii* strain G1 which lacks all CFH/FHL1/CFHR-binding proteins was used as a model for functional analyses. CRASP-4 exposed to the surface of *B. garinii* G1 bound CFHR1, CFHR2, and CFHR5, but not CFH as demonstrated by serum adsorption assays. In the absence of CFH or FHL1, the transformed borrelial cells deposit large amounts of complement component on their surface and did not inactivate C3b. Further functional analysis revealed that upon NHS incubation, CRASP-4-producing *B. garinii* G1 cells were sensitive to complement-mediated lysis. Taken together, CRASP-4 of *B. burgdorferi* does not protect borrelial cells from complement-mediated killing in spite of its ability to bind different CFHRs.