V 34 *Borrelia valaisiana* resist complement-mediated killing by a novel immune escape mechanism

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Spirochetes belonging to the *Borrelia* (*B*.) *burgdorferi* sensu lato complex differ in their resistance to complement-mediated killing, particularly with regard to human serum. In the present study, we aimed at elucidating the complement susceptibility of the tick-originated *B. valaisiana* isolates VS116, Bv9, and ZWU3-Ny3 collected in Switzerland and in 2 distinct geographical regions in Germany. In the presence of 50% human serum, growth of isolates VS116 and Bv9 was strongly affected, while growth of ZWU3-Ny3 was not. In addition, the highly susceptible isolates VS116 and Bv9 showed strong deposition of complement components C3, C6, and the terminal complement complex C5b-9 on their surface. The destructive activity of complement leads to substantial morphological changes as exemplified by the generation of numerous blebs and cell ghosts. In contrast, no surface-deposited complement components and no aberrations in cell morphology have been detected for isolate ZWU3-Ny3. While further investigating the protective role of bound complement regulators in mediating complement resistance as previously described for *B. burgdorferi*, *B. afzelii*, and *B. spielmanii*, unexpectedly, none of the analyzed isolates were able to bind the main immune regulators of the alternative pathway, factor H and FHL-1 or C4Bp, known to be the main regulator of the classical pathway. Degradation of surface-bound complement components by an intrinsic *Borrelia*-mediated proteolytic activity has also been excluded. Taken together, these findings suggest that *B. valaisiana* differ in their capability of resisting complement-mediating killing, which has also been recently observed for *B. spielmanii*. Seemingly, distinct isolates exhibit the potential to evade complement attack by human serum. However, the mechanism utilized by these spirochetes to circumvent bacteriolysis remains to be determined, yet.