

Publication

Bartonella entry mechanisms into mammalian host cells

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The Gram-negative genus *Bartonella* comprises arthropod-borne pathogens that typically infect mammals in a host-specific manner. *Bartonella bacilliformis* and *Bartonella quintana* are human-specific pathogens, while several zoonotic bartonellae specific for diverse animal hosts infect humans as an incidental host. Clinical manifestations of *Bartonella* infections range from mild symptoms to life-threatening disease. Following transmission by blood-sucking arthropods or traumatic contact with infected animals, bartonellae display sequential tropisms towards endothelial and possibly other nucleated cells and erythrocytes, the latter in a host-specific manner. Attachment to the extracellular matrix (ECM) and to nucleated cells is mediated by surface-exposed bacterial adhesins, in particular trimeric autotransporter adhesins (TAAs). The subsequent engulfment of the pathogen into a vacuolar structure follows a unique series of events whereby the pathogen avoids the endolysosomal compartments. For *Bartonella henselae* and assumingly most other species, the infection process is aided at different steps by *Bartonella* effector proteins (Beps). They are injected into host cells through the type IV secretion system (T4SS) VirB/D4 and subvert host cellular functions to favour pathogen uptake. Bacterial binding to erythrocytes is mediated by Trw, another T4SS, in a strictly host-specific manner, followed by pathogen-forced uptake involving the IalB invasin and subsequent replication and persistence within a membrane-bound intra-erythrocytic compartment.

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