

Pathogenesis of HIV-Related Bacillary Angiomatosis

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Bartonella is a bacterial pathogen that causes bacillary angiomatosis (BA) in HIV-infected patients. This condition is characterized by multiplication of blood vessels (angiogenesis) and the formation of tumor-like skin lesions, resembling cancer. If BA is not diagnosed and treated, it can cause death. More cases of *Bartonella* infection and BA in HIV-positive patients have been reported in San Francisco and California than in any other location in the world, so study of how this bacterium interacts with the AIDS virus is important to Californians and HIV-infected people who are at high risk for severe *Bartonella* infections.

The ability of *Bartonella* to cause angiogenesis and BA is unique and not known for any other bacterium. Even after years of research, the way that *Bartonella* causes BA lesions is still unknown. To study this angiogenesis process in more detail, we have developed a model that reproduces the manifestations of *Bartonella* (prolonged bloodstream infection and BA) that occur in humans co-infected with *Bartonella* and HIV. This model gives us two tremendous advantages: it allows us to 1) follow the natural course of these BA lesions; and 2) to study the BA lesions and how they form when a person is infected with both *Bartonella* and HIV at the same time.

We will also study how the *Bartonella* bacterium changes when it infects someone already infected with the AIDS virus, and how the immune system reacts to the *Bartonella* bacterial infection while trying to eliminate the *Bartonella* infection from the body. We believe that this project will provide knowledge about how *Bartonella* and HIV interact uniquely to cause the blood vessel tumors that are characteristic of BA lesions. An increased understanding of *Bartonella* pathogenesis will ultimately lead to potential strategies for improved treatment of *Bartonella* infection in HIV-infected patients. It may also provide information about how cancer forms tumors of blood vessels (angiogenesis), as well.