

**Project 4: Characterization of the *Chlamydia pneumoniae* adhesin proteins Yaa1 and Yaa3**

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**Summary:**

Chlamydia are obligate intracellular bacteria, which cause a number of different important human diseases. *Chlamydia trachomatis* is the most common cause of sexually transmitted diseases and responsible for infertility in women. In Third World Countries this pathogen is the main cause of preventable blindness with more than 90 million cases each year worldwide. *Chlamydia pneumoniae* is responsible for infections of the respiratory tract. Moreover, Chlamydia has been associated with a number of chronic diseases (for example atherosclerosis).

Our research focuses on the molecular interaction of *Chlamydia pneumoniae* with the human cell early in the infection. We have identified the novel chlamydial proteins Yaa1 and Yaa3 (yaa = yet another adhesin), which exhibit strong adhesion to human cells. Yaa1 is located on the surface of infectious chlamydial cells and a specific anti-Yaa1-antibody reduces dose-dependently the infection. Yaa1 functions during the initiation of infection, as it specifically adheres to cholesterol-rich microdomains of the human plasma membrane, where it stimulates the internalization of the bacteria. Likewise, the Yaa3 protein shows strong adhesion to human epithelial cells. The goals within this project are the recombinant expression of Yaa3 and the functional characterization using biochemical, immunological and cell biological approaches. We expect that this project will lead to the identification of target structures of host-microbe interaction and the assessment of their potential in prevention and therapy of human infections with *C. pneumoniae*.