

### 3 Objectives

*Chlamydomphila pneumoniae* has been suggested as causative agent for a multitude of acute and chronic diseases. Although the genome of *C. pneumoniae* has been sequenced completely this information has not led yet to an understanding of the mechanisms of infection and target cell activation nor to the identification of potential chlamydial virulence factors. In airway infection bronchial epithelial cells are the first line of defense getting in contact with *C. pneumoniae*. Subsequently, airway derived organisms may be able to spread systemically via different ways. Chronic or persistent intracellular infection of endothelial cells with *C. pneumoniae* has been associated with development of cardiovascular diseases.

The presented studies, therefore, addressed different objectives:

#### 4.1 Importance of airway epithelial cells

**First objective** of the present work was to clearly assess *C. pneumoniae*'s capability to infect and subsequently activate bronchial and alveolar epithelial cells.

Key mechanisms of epithelial cell activation could be identified. During an acute infection with *C. pneumoniae*, airway epithelium itself plays a prominent and active role by releasing pro- and anti-inflammatory mediators.

#### 4.2 Importance of endothelial cells

**Second objective** of this work was to elaborate the mechanisms of endothelial cell infection and activation by *C. pneumoniae*.

##### 4.2.1 Endothelial cells as target of pathogens or pathogen-derived products

The endothelium is involved in virtually most of all acute (and chronic) inflammatory responses. Previous studies indicated, that pathogens or pathogen-derived products are able to directly activate endothelial cells.

4.2.2 Mechanisms of endothelial cell infection and activation by *C. pneumoniae* with special respect to the importance of different chlamydial virulence factors should be elaborated.

Our results improve the understanding of the pathogenesis of *C. pneumoniae*-mediated respiratory and vascular diseases and may help in the establishment of innovative therapeutic strategies. Essential aspects of *Chlamydomphila pneumoniae*-mediated target cells activation could be summarized in a recently published review.