

Master Thesis

The role of the serine protease HtrA in infections with *Listeria monocytogenes*

AG Microbiology

“Pathogen-induced Signaling and Cancer”

The human epithelium is the first barrier to prevent bacterial infection diseases. However, many pathogens developed fascinating strategies to disrupt the epithelial barrier function. In our research group, we identified the bacterial serine protease HtrA that directly cleaves-off the ectodomain of the cell adhesion protein and tumor suppressor E-cadherin allowing cancer-associated signaling. The implication of HtrA has been well investigated for *Helicobacter pylori*. *Listeria monocytogenes* is a pathogen that induces listeriosis; a severe disease that ranks third in total number of deaths among food borne bacterial pathogens. Infections with *L. monocytogenes* lead to a strong E-cadherin shedding with unknown consequences:

The activity of HtrA from *Listeria monocytogenes*:

- Cloning, mutagenesis and purification of recombinant HtrA proteins
- Investigation of the activity of HtrA proteases: zymography, *in vitro* cleavage experiments, native and denaturing SDS PAGE, Western blotting, *etc.*

Interference of *L. monocytogenes* and epithelial host cells in HtrA-dependent pathogenesis:

- Identification of novel substrates from epithelial cells: cell culture, bacteria culture, infection experiments, biotinylation, substrate screen, *etc.*
- Function of HtrA in bacterial adherence and internalization: E-cadherin cleavage, bacterial adherence, internalization, cytokine ELISA

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