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DISSERTATION TITLE: *Structural and functional studies on the Yersinia ruckeri inverse autotransporters*

Y. ruckeri is the causative agent of enteric redmouth disease (ERM), a serious infection of marine and freshwater fish. ERM is a global problem affecting aquaculture facilities worldwide. Losses caused by ERM can reach up to 75% of the fish stock. The amount of research on the pathogenicity of *Y. ruckeri* is still limited.

In the presented thesis, Agnieszka Wrobel and coworkers discovered a new family of virulence factors related to the occurrence of the ERM. They have shown the presence, the domain architecture, the expression and the function of these virulence factors in various *Y. ruckeri* strains. The work presented in the thesis provides a new insight into *Y. ruckeri* pathogenesis and contributes to a better understanding of how *Y. ruckeri* survives in the aquatic environment. The thesis also provides the base for a new design of antibiofilm agents.

Adhesins are surface-exposed virulence-related bacterial molecules involved in adherence to host cells and tissues. Adhesins are widely distributed in Gram-negative bacteria. The best studied examples are invasin and intimin, belonging to the inverse autotransporter family. Their presence, structure and role in *Y. ruckeri* strains are still unclear. This thesis shows that the inverse autotransporters are variably present in different *Y. ruckeri* strains and that their length also varies. Inverse autotransporters are proteins with a number of repetitive regions. These repetitive regions could only be properly identified using the third generation technology sequencing. These proteins are expressed at conditions relevant for pathogenesis and are exposed at the cell surface. They play a role in biofilm formation and pathogenesis.

Finally, this thesis includes a plasmid sequence referred to as pYR4 found in a highly pathogenic *Y. ruckeri* NVH_3758 strain. This plasmid encodes type IV pili and conjugation system and can possibly contribute to *Y. ruckeri* virulence.