DOCTORAL CANDIDATE:	Nandini Chauhan
DEGREE:	Philosophiae Doctor
FACULTY:	Faculty of Mathematics and Natural Sciences
DEPARTMENT:	Department of Biosciences
AREA OF EXPERTISE:	Molecular Biology
SUPERVISORS:	Prof. Dirk Linke
DATE OF DISPUTATION:	17th of January 2016

DISSERTATION TITLE: ***Molecular characterization of the autotransport process of* Yersinia *adhesin A (YadA)***

Adhesins are surface structures of bacteria that facilitate their attachment to host cells or non-living materials. Most adhesins do not just bind to any surface; rather, they recognize specific molecules or receptors on the target surface. This recognition mechanism ensures that the bacteria infect a particular host species and within the host it infects a particular cell or tissue type. Thus, adhesins are one of the important virulence factors of bacteria. Yersinia Adhesin A (YadA) is one of the key virulence factors of *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*. These two species of *Yersinia* are human pathogens and they cause a disease known as Yersiniosis. The symptoms of the disease include fever, abdominal pain (often confused with appendicitis), bloody diarrhea, and in some cases septicemia ("blood poisioning") or acute arthritis. Apart from its adherence function, YadA plays a role in preventing killing of the bacteria by immune system of the host and in biofilm formation (clumping of bacterial cells) which is a strategy of bacterial survival in the host.

YadA is first produced within the cell and then transported to the surface of the bacteria. Since, Yersinia is a gram-negative pathogen; it has two membranes surrounding the bacterial cell known as inner and outer membrane. So, YadA has to pass through these two membranes in order to appear on the surface of the bacteria. This thesis explains the mechanism by which YadA is inserted into the outer membrane of bacteria. There are a number of proteins similar to YadA which are present in other bacteria, *e.g*. NadA of *Neisseria meningitidis* which causes life-threatening meningitis (inflammation of the membranes of brain and spinal cord), Hia of *Haemophilus influenza* which causes pneumonia, etc. The understanding of the mechanism of generation and transport of YadA in *Yersinia* can be extrapolated to these related proteins. This can pave the way towards development of drugs that specifically target YadA in *Yersinia* or YadA-like proteins in other bacteria.