SARA THULIN HEDBERG was born in Stockholm in 1980. She studied molecular biology in Uppsala and received her MSc degree in 2003. Her interest in meningococci was sparked at the time she performed her MSc project in 2003 at the Swedish Reference Laboratory for Pathogenic Neisseria, Department of Laboratory Medicine, Clinical Microbiology, Örebro University Hospital, where she also continued with her PhD project. During her doctoral studies, Sara has also been working as a guest researcher at the French Reference Centre for Meningococci, at the Pasteur Institute, Paris, France in 2009, together with Dr. Muhamed-Kheir Taha and colleagues on biological costs of rifampicin resistance in meningococci.

*Neisseria meningitidis*, also known as the meningococcus, is a globally spread obligate human bacterium causing meningitis and/or septicaemia. It is responsible for epidemics in both developed and developing countries. Untreated invasive meningococcal disease is often fatal, and despite modern intensive care units, the mortality is still remarkably high (approximately 10%). The continuously increasing antibiotic resistance in many bacterial pathogens is a serious global public health threat. The meningococcus has mostly been an exception that, in general, has remained susceptible to the antibiotics used for treatment and prophylaxis. However, during recent decades, there have been increasing reports of emerging resistance also in meningococci. It is crucial to identify and monitor the spread of this resistance in the meningococcus in order to prevent treatment failure resulting from the administration of inappropriate antibiotics. In addition, it is important to follow the changing patterns of the resistance as well as understand the genetic mechanisms responsible for the resistance, both for the development of culture-independent genetic resistance testing and to enable future development of new antimicrobial agents.

In the present thesis the antibiotic susceptibility patterns of Swedish and African meningitis belt meningococcal isolates have been described. In addition, the genes linked to reduced susceptibility to penicillin and resistance to rifampicin have been examined and the impact of rifampicin resistance on meningococcal pathogenicity/virulence has been explored.

Antibiotic susceptibility and resistance in *Neisseria meningitidis* – phenotypic and genotypic characteristics

Sara Thulin Hedberg

Biomedicine