

Research Project

The molecular mechanism of outer membrane protein insertion by BamA and its role as a target for novel antibiotics

Third-party funded project

Project title The molecular mechanism of outer membrane protein insertion by BamA and its role as a target for novel antibiotics

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Organisation / Research unit

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Project start 01.07.2017

Probable end 31.12.2020

Status Completed

Many particularly dangerous bacteria are protected by an outer membrane. We want to understand the mechanism by which this membrane develops in order to find targets for new active substances.

Infections by so-called Gram-negative antibiotic-resistant bacteria are difficult to treat because these bacteria are protected by two membranes. Yet there are points in the outer membrane that are open to attack by active substances. We are characterizing one of these points, the protein BamA. BamA controls the process of incorporating other proteins into the membrane. If BamA is knocked out, this is fatal for the bacterium. We are studying the function of BamA and the incorporation of proteins at the atomic level, using NMR spectroscopy and X-ray crystallography. This makes the interactions between BamA and other molecules visible. In this way we can gain a better understanding of the mechanisms and look for active substances that interrupt them. Resistant strains of Gram-negative bacteria against which all known antibiotics are ineffective occur with increasing frequency. There is an urgent need for new active substances to control them. The aim of our project is to understand the mechanisms that Gram-negative bacteria use to incorporate membrane proteins into their outer membrane. Our findings can point to possible new targets for antibiotic substances that can then be sought and adapted specifically. We will also optimise existing antibiotic candidates in the same way.

Financed by

Swiss National Science Foundation (SNSF)

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