## Project 1.5. Cellular mechanisms handling failed mitochondrial protein translocation events

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## Background:

Proteins perform critical functions in all living organisms, as enzymes, structural elements, transporters, signal carriers, or receptors. Thousands of different proteins are produced in each cell, and more than half of them require transport to their destination to be able to fulfill their functions. The proper course of this transport is essential for the proper functioning of the body, and its disorders have serious health consequences. The cell has a complex architecture in which specialized and organized structures called organelles are separated. Protein delivery to organelles is a complex process that requires the cooperation of specialized transport pathways and quality control mechanisms supervising their work. Transport of proteins to membrane-surrounded organelles like mitochondria is particularly complicated. Growing evidence indicates that the process of transporting proteins across mitochondrial membranes is not always completed smoothly. The blockade of mitochondrial protein transport has far-reaching consequences, as it disturbs the protein balance of the entire cell. Our research focuses on understanding cellular mechanisms that prevent blocking of protein transport into mitochondria.

## Aim:

The project aims to uncover and characterize cellular response to failed mitochondrial protein translocation events at the molecular level, and to understand the role of this quality control mechanism in physiology and pathology.