
Molecular and structural biology of bacterial adaptability

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Résumé

Because bacteria are only able to generate clonal populations of themselves, they should be extremely vulnerable to changes in their environment. Yet, these organisms are extremely adaptable and able adjust their lifestyle very quickly. In this context, it is crucial to fully understand the molecular mechanism of bacterial adaptability to ultimately target and limit this ability. My project focuses on the human pathogen *Streptococcus pneumoniae* (the pneumococcus), for which the horizontal gene transfer mechanism of natural transformation is central to the bacterial physiology and virulence. This intricate multistep process is mediated by a group of dedicated molecular machines called the transformasome. The proposed project aims at describing the architecture and function of the transformasome at the cellular and molecular level, by combining (1) molecular biology and biochemical studies *in vitro*, (2) structural biology of purified proteins or protein complexes, (3) structure-function studies *in vitro* and *in vivo*, and (4) structural biology *in situ*.

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