**Master Biologie – UFR Chimie et Biologie**

**Internship project Master 2 Recherche**  
**Year 2016/2017**

**Laboratory:** Institut de Biologie Structurale  
**Team:** Biomolecular NMR Spectroscopy  
**Director:** Winfried Weissenhorn  
**Head of team:** Jérôme Boisbouvier

**Name and status of scientist in charge of the project:** Paul Schanda / Beate Bersch  
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**Specialty MASTER:**
- [ ] Neurosciences and Neurobiology  
- [ ] Immunology, Microbiology, Infectious Diseases  
- [x] Integrative Structural Biology  
- [ ] Physiology Epigenetics Development Differentiation

**Title of project:** Addressing biological function and specificity of two different mitochondrial chaperone assemblies by NMR spectroscopy

**Objectives (3 lines max):**
The project aims at the characterization of the Tim8/13 chaperone complex from the mitochondrial intermembrane space. Solution NMR will be used to address chaperone substrate interaction: binding site location, changes in dynamics and/or protein conformation as seen from the chaperone or protein substrate.

**Abstract (10 lines max):**
Mitochondria perform a wide range of key cellular functions, many of which require the import and export of metabolites through the mitochondrial membranes. This transport is performed by membrane proteins in the inner and outer mitochondrial membrane. The most mitochondrial proteins are produced in the cytosol and need to be imported. A sophisticated transport machinery leads the protein precursors from the cytosol, through the mitochondrial outer membrane to the intermembrane space for eventual insertion into the membrane. Two homologous heterooligomeric chaperone assemblies are known to protect membrane protein precursors from the aqueous environment in the intermembrane space: TIM9/10 and TIM8/13. The mechanism by which these chaperones transport their substrate proteins is currently poorly understood. We characterized binding of unfolded carrier proteins to TIM9/10 and want to study the homologous TIM8/13 assembly in order to obtain insight on a molecular level on substrate specificity and possible interactions between the two assemblies that are simultaneously present in the intermembrane space.

**Methods (3 lines max):**
Protein expression and refolding, isotopic labeling, protein purification, chromatography, solution NMR, processing and interpretation of NMR data

**Relevant publications of the team (3 max):**

**Requested domains of expertise (few keywords):**
interest in structural biology and NMR, protein purification