

## Master in Chemistry

### Sujet de stage de Master 2

**Laboratoire :** Institute of Structural Biology (IBS)

**Directeur :** Winfried Weissenhorn

**Intitulé de l'équipe:** Viral Infection and Cancer Group, Mass spectrometry laboratory **Responsable:** Carlo Petosa

**Nom et Qualité du Responsable du Stage:** Elisabetta Boeri Erba, HDR

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**Parcours de Master 2:**

Chemistry for Life Sciences (CLS)

**Titre du sujet :** *Mass spectrometry-based sequencing of soluble and membrane proteins*

**Objectifs visés du stage:**

This project aims to perform sequencing of proteins and to study their post-translational modifications. To do that, the student will use and compare two different instruments (see below).

**Intérêts pédagogiques et compétences visées:**

The project should appeal to students with a background in chemistry, who are interested in biological and analytical chemistry and its application to answer biological questions.

**Résumé:**

The primary sequence and post-translational modifications (PTMs) of proteins influence their structure and function, tuning their actions in key cellular processes. The IBS MS laboratory aims to characterise proteins and their PTMs using mass spectrometry (MS). MS can assess the mass of biomolecules with high accuracy, sensitivity and rapidity. In the MS laboratory of the IBS, two mass spectrometers allow us to sequence intact proteins and to determine type, number and position of their PTMs using the so-called "top-down approach".

**Approches & matériels utilisés:**

The student will use a Matrix Assisted Laser Desorption Ionisation (MALDI) time-of-flight (TOF)/TOF (Bruker), and an electrospray-orbitrap (Thermo scientific) to sequence soluble and membrane proteins and localise their PTMs. She/he will assess the performances of the two different instruments in terms of sensitivity, resolution,  $m/z$  range and sequence coverage.

**Domaines de compétences souhaitées du candidat (3 lignes max):**

Biological and analytical chemistry, structural determination of macromolecules

**Dates du stage:** January 2021- June 2021