

LERU STudent REseArch Mobility Programme (STREAM)  
Project proposal



**Host University:**  
Università degli studi di Milano



**Field:**  
Health and welfare

**Specified field, subject:**  
Drug development

**Research project title:**  
Bioanalytical approaches in drug discovery and development



Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
x									x	x	x



Possible duration in months:

1	2	3	4	5	6
	x	x	x	x	x



**Suitable for students in:** 2<sup>st</sup> cycle (master students)

**Prerequisites:** English: level B2

**Restrictions:** none



**Description:**

The research carried out in the Pharmaceutical and Biopharmaceutical Analysis Unit of the Department of Pharmaceutical Sciences is mainly focused on the following research fields:

1. Protein-ligand interaction and covalent binding by High Resolution Mass Spectrometry (HR-MS): characterization of protein-drug covalent binding as potential mechanism triggering Idiosyncratic Adverse Drug Reactions (IADRs) and screening of proteins and DNA non-covalent ligands in drug discovery and drug toxicity studies.

2. Descriptive and quantitative proteomics by HR-MS: applications to different biological matrices (plants, vegetal extracts, cells, tissues) to obtain

- the identification and cataloguing of the proteins expressed in a cell or tissue (descriptive proteomics) and of post-translational modifications (PTMs) that are critical to the protein's function
- indications on the mechanism of action of biologically active compounds (plant extracts included) (quantitative proteomics)
- Phytochemicals for pharmaceutical, nutraceutical and cosmetic use: development and application of methods for the isolation, characterization, quantization of active principles of vegetal sources and evaluation of their bioavailability and of their biological activity (either in vitro or in vivo)

3. ADMET and pre-ADMET studies:



- development and application of innovative MS-based methods for qualitative and quantitative analysis of drugs and metabolites in biospecimens (cells, tissues, biological fluids)
- In vitro studies: chemical and metabolic stability of biologically active compounds
- Characterization of in vitro and in vivo metabolic pathways of drugs (metabolomics)

**Faculty or Department:** Department of Pharmaceutical Sciences - Università degli Studi di Milano

**Contact person:** International relations office, University of Milan

**Contact email:** [international.programmes@unimi.it](mailto:international.programmes@unimi.it).