



UNIVERSITÀ
DEGLI STUDI
FIRENZE
PeptLab
INTERDEPARTMENTAL RESEARCH
UNIT OF PEPTIDE AND PROTEIN
CHEMISTRY AND BIOLOGY



www.peptlab.unifi.it



DOCTORAL PROGRAMME IN CHEMICAL SCIENCES – University of Florence (Italy) XXXVIII cycle - PhD fellowship 2022-2025

Deadline for submission: 8 August 2022 12:00 noon (Italian time)

Provisional start date: 01/11/2022. Contract for 3 years

Identification of biologically active peptides by innovative liquid chromatographic-mass spectrometric technologies in self-recoverable proteinaceous materials to be translated in active ingredients

Supervisor: Prof Anna Maria Papini (annamaria.papini@unifi.it) - Interdepartmental Research Unit of Peptide and Protein Chemistry and Biology, Department of Chemistry “Ugo Schiff” e NeuroFarBa, Università degli Studi di Firenze. **Cosupervisor:** Dr. Hendrik Rusche (hr@fischer-analytics.com) - fischer analytics GmbH, Saarlandstraße 377, D-55411 Bingen am Rhein (Germany)

The research project aims to implement key technologies of purification and identification of bioactive peptides by chromatography and mass spectrometry in self-recoverable protein materials to be translated in active ingredients to be exploited in the fields of biomaterials also for biomedical applications, cosmeceutics, and nutraceuticals.

The identified bioactive peptides shall demonstrate optimal sustainability, circularity, health, and safety profiles in the optic of circular economy.

The PhD student will be involved in setting-up advanced methodologies to extract proteins from vegetal and/or animal source, preparation of hydrolysates, chromatographic purification (CEX, SEC, etc.) and MS-MS analysis of the recovered peptides. The use of bioinformatic tools will allow characterization of their properties as active ingredients to be exploited as biomaterials for biomedical applications, cosmeceutics, and nutraceuticals.

The PhD student will be trained also in solid-phase synthesis of characterized peptides and assays to evaluate bioactivity. Scale up of the optimised processes of extraction, isolation, and final characterization will be a fundamental part of the project to lead the PhD student into the phase of industrial exploitation of the new peptide active ingredients in the optic of circular economy.

All the phases of the project will be developed in strict cooperation with Fischer Analytics. The PhD student will take advantage of knowledge, skills, and instrumentation available both at PeptLab at the Scientific Campus of Sesto Fiorentino and at Fischer Analytics where she/he will spend at least six months at the company/abroad. During the research periods, the PhD student will have access to the instrumentation such as mass spectrometers (single quadrupole, -TOF, MS-MS, etc) coupled to liquid chromatographic systems (LC, HPLC, U-HPLC, FPLC, FCPC, SMB) with dedicated detectors (ELSD, ECD, CAD, etc.), including bioinformatic tools (<https://www.fischer-analytics.com>).

Eligibility criteria

The candidate shall have a background in peptide and protein science. Knowledge on protein extraction/isolation and MS analysis would be appreciated.

The candidate must be an independent, well-organized and rigorous person, managing his/her own research and coordinating the different aspects of the research project to meet deadlines. She/he shall have good interpersonal skills to work in team, also actively participating in laboratory meetings. He/she shall provide novel ideas, being up-to-date with scientific literature, compile results for publication in high impact peer-reviewed journals and present the results orally.

Specific admission requirements and application rules:

https://www.unifi.it/upload/sub/dottorati/borse_pnrr_2022/dr_778_pnrr_080822_bando_all1_eng.pdf

Fact sheet: https://www.unifi.it/upload/sub/dottorati/borse_pnrr_2022/scheda_borse_all2_eng.pdf