INSTITUTE OF MICROBIOLOGY

of the Czech Academy of Sciences

Doctoral position in structural mass spectrometry

The Institute of Microbiology of the Czech Academy of Sciences,
Prague, Czech Republic
https://mbu.cas.cz/en/

The Laboratory of Structural Biology and Cell Signalling is looking for a motivated

DOCTORAL (PhD) CANDIDATE

to work on an EU-funded doctoral position as part of SPIDoc's – a Marie Skłodowska-Curie Actions (MSCA) Doctoral Network linking 10 PhD positions at 7 beneficiary institutions and 8 associated partners, including academic and non-academic sectors located in 8 countries.

SPIDoc's projects will apply cutting-edge technologies, like native mass spectrometry, X-rays for single particle imaging and molecular dynamics simulation to understand the dynamics of viral particles. Each SPIDoc's PhD project will include secondments at beneficiaries' or associated partners' locations, allowing an international and interdisciplinary exchange for the progress of the project and for the scientific and personal development of the doctoral candidate.

Qualifications and experience – who can apply:

The applicant must:

- Have his/her Master's degree or its equivalent awarded in Biochemistry, Analytical Chemistry or a related field. At a minimum, the candidate must have obtained their Master's degree by the starting date of the project.
- Be available to start the project preferably in February / March 2024, but at the latest in July 2024 (exact dates negotiable).
- Comply with the MSCA eligibility rule for mobility – i.e. the applicant must not have resided or carried out their main activity (work, studies, etc.) in the Czech Republic for more than 12 months in the 36 months immediately before their date of recruitment.
- Demonstrate a level of both written and spoken English suitable for fully professional work.

SPIDoc's – The next generation MS SPIDoc's project has received funding from the European Union's Marie Skłodowska Curie Action program HORIZON-MSCA-2022-DN Grant Agreement Nr. 101120312

- Be able and willing to travel for occasional training at other project partners' locations within the consortium as well as for two research secondments to Uppsala (Sweden, 2 months) and Hamburg (Germany, 3 months).
- Be communicative and show aptitude for team-work.

Conditions – we offer:

- International and interdisciplinary research project: a closely collaborating network of beneficiaries and associated partners from 8 countries.
- A unique training programme with both online and hands-on events, spanning topics from mass spectrometry instrumentation and computational molecular simulations to structural virology applications as well as including soft skills.
- Support by excellent mentors, creative and international environment, access to exciting experiments and state-of-the-art infrastructure and equipment at the modern BIOCEV campus in Vestec/Prague (https://www.biocev.eu).
- Participation to international conferences and consortium training workshops.

- Full-time temporary contract for the whole period of the MSCA fellowship – 36 months.
- Gross salary (after employer's social contributions): **2425 EUR/month** (living and mobility allowance) + additional 490 EUR/month family allowance paid as part of the gross salary (if eligible); everything paid in CZK and according to MSCA DN salary rules.
- Employee benefits: 30 days of paid holiday per year, financial contribution for the catering.

Application:

- Following the application process details published at https://www.ms-spidoc.eu/spidocs-doctoral-network-how-to-apply/ send all the required documents in a single file to the email address of the project coordinator at **infospidocs@cssb-hamburg.de** by **13th October 2023**. Late applications will be considered until the position is filled.

- Pre-selected candidate(s) will be invited for an online interview via zoom.
- For more information, please visit https://www.ms-spidoc.eu/spidocs/, for additional questions feel free to informally contact directly Dr. Alan Kadek (alan.kadek@biomed.cas.cz)

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Details of the PhD project:

See also https://www.ms-spidoc.eu/phd-project-in-czech-republic/

Native mass spectrometry with advanced fragmentation schemes for protein structural characterization.

Enrolment in Doctoral degree: Dept. of Biochemistry, Charles University, Prague, Czech Republic

Place of work: BIOCEV – Institute of Microbiology, Czech Academy of Sciences, Vestec / Prague, Czech Republic

Supervisor: Dr. Alan Kádek, Dr. Petr Novák (Charles University, consultant)

Native mass spectrometry (MS) is a powerful technique guiding biopharmaceutical research and structural biology. Control of structural conservation and deep characterization of gas-phase non-covalent protein complexes is crucial in native MS, but often hampered by the availability of only one or two dissociation techniques at most MS instruments. This PhD project aims first to develop advanced multimodal experimental schemes for top-down analysis of non-covalent protein complexes and second to study the conservation of protein structure in the gas phase during native MS experiments.

A state-of-the-art 15-Tesla Fourier-transform ion cyclotron resonance mass spectrometer will be used in the project. This instrument employs multiple collision- and electron-based dissociation techniques while it is also custom-coupled to infrared and ultraviolet lasers for photodissociation experiments. Gas-phase protein fragmentation behaviour will be correlated with solution-based structural techniques such as hydrogen/deuterium exchange MS and, in collaboration with the Uppsala group, with molecular dynamics simulations. The candidate will also be seconded to other SPI*Docs* partners to learn protein production (European XFEL, Hamburg), computational simulations (UU, Uppsala) and be involved in photodissociation experiments with other consortium PhD candidates performed in Prague (UCBL, Lyon; UU, Uppsala and VUA, Amsterdam).

Formal application and enrolment into the PhD programme at Charles University will be handled after the selection of the successful candidate.

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