Institut de Biologie Structurale
UMR 5075 CEA – CNRS – Univ. Grenoble-Alpes
METALLOPROTEINS UNIT

Postdoctoral position in structural biology to study radical SAM enzyme mechanisms

A 2-year postdoctoral position is available to work on **the structural characterization of reaction intermediates in the time course of radical SAM enzymes, involved in the assembly of the [FeFe]-hydrogenase active site**. This position will be hosted in the Metalloproteins Unit at the Institut de Biologie Structurale in Grenoble (IBS) with a preferred starting date of June 17, 2024.

The postdoctoral fellow will be expected to carry out original research related to the study of the molecular mechanisms involved in the assembly machinery of the [FeFe]-hydrogenase active site. The candidate will use different structural biology, in vitro assays, computational chemistry and spectroscopic techniques to capture and characterize the successive reaction intermediates in the time course of this process. This study will combine structural analyses using time-resolved serial crystallography with studies using electron paramagnetic resonance spectroscopy and theoretical calculations to decipher the catalytic mechanism and analyze the role of the protein matrix in controlling these reactions. The long-term goal of this study is to enhance our understanding of these radical SAM proteins to enable biotechnological applications.

The postdoctoral researcher will be responsible for the production of protein samples using already established reproducible protocols in the laboratory, to prepare microcrystals for structural studies through serial crystallography. They will also oversee the development of a sample holder for anaerobic work to prevent damage caused by oxygen to both metal cofactors and radical intermediates. Finally, they will be in charge of coupling photosensitizers to the protein to synchronize the radical reaction in crystals, enabling the measurement of diffraction data at different time points and capturing the sought-after intermediates.

Selected work

Rohac *et al*. *Nat Chem* 8. **2016**. 10.1038/nchem.2490
Sicoli *et al*. *Science* 351. **2016**. 10.1126/science.aad8995
Rohac *et al*. *J Am Chem Soc* 143. **2021**. 10.1021/jacs.1c03367
Omeiri *et al*. *Angew Chem* Intl Ed. **2023**. 10.1002/anie.202314819

Qualifications

The ideal candidate must hold a Ph.D. with a solid background in laboratory biochemistry, protein expression and purification and be especially interest in metalloproteins and enzymatic mechanisms. Experience in anaerobic conditions will be appreciated. Strong experience in structural biology and X-ray crystallography is an asset. A certain affinity for using computer tools, with an interest in simple programming for the utilization of software for the processing and analysis of structural data will be greatly appreciated.

The successful candidate will join the Metalloproteins Unit at IBS and will closely work with Dr. Yvain Nicolet. The Metalloproteins Unit has a solid experience in the structural study of metalloproteins and has a set of 6 glove boxes to work “from gene to structure” in the absence of oxygen (https://www.ibs.fr/research/research-groups/metalloproteins-group/).

This position is part of a broader project and the candidate will also work in close collaborations with the SyMMES/CAMPE group led by Serge Gambarelli for advanced Electron paramagnetic experiments and the European Synchrotron Radiation Facility ID29 beamline led by Daniele de Sanctis for advanced X-ray diffraction experiments. These three laboratories are located

within the same scientific campus in Grenoble, France, and have a longstanding tradition of collaborations in their respective fields of study.

Before applying, we encourage candidates to contact yvain.nicolet@ibs.fr.

We seek a motivated and open-minded researcher with strong communication skills, who thrives in a collaborative, multidisciplinary team. Prior knowledge of the French research system is not required, but would be a valuable asset for increased autonomy in the role.

Position Summary

Funding for this position has been awarded by the French National Research Agency (ANR) as a part of a broader French project. **The position should start June 17, 2024**. The selected candidate will be employed by the CEA and the initial contract will run for 24 months with a possible 1-year extension. The salary will depend on experience, with a net starting rate of pay of about €2300 /month. Health insurance and social contributions will be paid by the employer

About Grenoble

Grenoble is a major university town in France, home to more than 58,000 students from over 70 different countries. It also represents a world-ranking research community thanks to a unique combination of a major University, several state-owned basic- and applied-research organizations, high ranking international scientific facilities (ESRF synchrotron facilities and ILL neutron facilities) and major high-tech industries. Thanks to this diversity, Grenoble is a hive of activity at all hours of the day and night! Grenoble is also well known for its unique position in the French Alps with major ski resorts accessible in under an hour, and exceptional natural sites to visit in other seasons.

Applications

To apply, please provide a detailed resume, a summary of your past research activity, a letter to describe how you would fit to the requested profile, the transcripts of your academic records and *Ph.D*. degree and two reference letters to Yvain Nicolet (yvain.nicolet@ibs.fr (+33 4 57 42 86 03)) The application must also be submitted through the following website before **May 15, 2024**:
https://www.emploi.cea.fr/Pages/Offre/detailoffre.aspx?idOffre=31322&idOrigine=502&LCID=1036&offerReference=2024-31322

In accordance with the commitments made by the CEA in favor of the integration of people with disabilities, this job is open to all