

Computational Biology / Bioinformatics Project Scientist to join the Superti-Furga Lab (m/f/d)

Apply now

Do you want to be part of an interdisciplinary project, bringing together protein-protein interaction data of transmembrane proteins with the knowledge from protein structures and genetic variants using artificial intelligence and machine learning?

We are looking for a **computational biology / bioinformatics scientist** to mine, evaluate and analyze protein-protein interaction data on human membrane transporters as well as implement experimental structure data and AlphaFold models for predicting biomedical effects of genetic variants in human membrane transporters.

You will work in the Giulio Superti-Furga group (CeMM, Vienna) on the project “mDIAMANT: machine learning decodes interaction archetypes of membrane proteins to predict the effect of genetic variants”. mDIAMANT is a collaboration project with the Peter Sykacek group at BOKU, Vienna. You will be working closely with the two group leaders and postdoctoral and PhD student colleagues who will join the project, at CeMM and BOKU respectively.

Together we want to manifest the biomedical impact of human transporter research coupling state-of-the-art computational and experimental approaches.

Your profile

- PhD in bioinformatics, proteomics, structural biology or similar experience
- Experience in computational structural biology
- Knowledge of computational modelling and analysis of protein structures (e.g.: AlphaFold multimer models)
- Understanding of structural-evolutionary relationships (is beneficial)
- Solid understanding of basic statistics
- Interest in the structural principles of protein-protein interactions
- Interest to work in a multidisciplinary team at the interface of protein structural modelling, interaction proteomics and machine learning
- Strong data visualization skills is an asset
- Knowledge on advanced statistical approaches is an advantage
- Ability to work in a team and pursue goals in a focused way
- Excellent written / oral communication skills in English

The mDIAMANT collaboration project

Starting in summer 2024 the mDIAMANT collaboration project is supported by the WWTF (Vienna Science and Technology Fund) through the life science program “Understanding Biology with AI/ML”. The aim of this project is to understand how proteins cooperate and how they interact, with a focus on transmembrane proteins or membrane transporters. Living cells depend crucially on protein interactions. The underlying mechanisms can be understood as a series of locks and keys: to function properly, different entities must match in structure and be in contact at the right interface.

This information is not only crucial to understand biology but also for developing cures for diseases. mDIAMANT will use new experimental data (i.e. a very large dataset on the affinity-purification mass spectrometry-derived interactome of membrane transporters) coming from the two large Solute Carrier (SLC) membrane transporter-focused Innovative Medicines Initiative consortia, RESOLUTE and REsolution (<https://re-solute.eu/>) which were coordinated by the Superti-Furga laboratory, and through artificial intelligence and machine learning establish an inventory of structure motifs of protein-protein interactions interfaces. Machine learning can empower scientific advances in areas of biology which are of fundamental importance, yet difficult to achieve with standard approaches. Even though proteins need to interact with other proteins to achieve biologically meaningful function, the "code" determining their interactions, has not been fully deciphered. As a first integral contribution in cracking this code, we propose to use machine learning to break down the problem into a manageable number of interaction types, which we call "archetypes". Our goal is to build a structural catalog of protein-protein interaction (PPI) archetypes and use it to predict the effect of human genetic variation. We will build structural models of PPIs and machine learning to classify modes of interactions based on sequence and structure features. Many disease-associated genetic variants affect membrane proteins and are thought to affect PPIs. Consequently, we aim to gain mechanistic understanding of how proteins, in particular interaction partners of membrane transporters, interact and to explain how mutations can lead to disease by disrupting these protein interactions.

The Superti-Furga Lab

The Superti-Furga group (<http://superti-furga-lab.at/>) is composed of an international team of 20 scientists working together on understanding drug function at the molecular level. The laboratory investigates how cells and biological systems in general manage access to the environment through cellular transport. In particular how access to nutrients and energy source is tuned to metabolism and need of individual cell types. Moreover, the lab has pioneered approaches for functional precision medicine. The laboratory operates on a truly multidisciplinary basis and involves functional genomics and proteomics, structural analysis, chemical biology, high-content imaging, bioinformatics and physiology, reflecting the blend of expertise of the laboratory members.

The Sykacek Lab

The Sykacek group brings key and deep expertise in computational biology and machine learning. Peter Sykacek is group leader for analytical methods development at the Institute of Computational Biology at BOKU, the University of Natural Resources and Life Sciences. The focus of the work is on devising and implementing probabilistic machine learning and Bayesian methods for applications in computational biology and medical informatics. A PhD student under his supervision will lead the machine learning part of the project, developing, optimizing and quality controlling the modelling pipelines.

CeMM Research Center for Molecular Medicine

CeMM is an international research institute of the Austrian Academy of Sciences and a founding member of EU-LIFE. The mission of CeMM, the Research Center for Molecular Medicine of the Austrian Academy of Sciences is to achieve maximum scientific innovation in molecular medicine to improve healthcare. At CeMM, an international and creative team of scientists and medical doctors pursue free-minded basic life science research in a large and vibrant hospital environment of outstanding medical tradition and practice. CeMM's research is based on post-genomic technologies and focuses on societally important diseases, such as immune disorders and infections, cancer, aging and metabolic disorders. CeMM operates in a unique mode of super-cooperation, connecting

biology with medicine, experiments with computation, discovery with translation, and science with society and the arts. CeMM discovers and develops technologies to explore human biology with the purpose of defeating disease at its roots. Because Science is our Medicine! CeMM is a proud recipient of the HR Excellence in Research Award (HRS4R). This award indicates that CeMM takes care of the well-being of its employees, that the recruitment process is open, fair, and transparent, and that CeMM offers professional appraisals and career development procedures. More than 150 people from 49 nationalities are working at CeMM. The institute promotes equal opportunity and harbors a mix of different talents, backgrounds, competences, and interests. www.cemm.at

BOKU University of Natural Resources and Life Sciences

The BOKU (www.boku.ac.at), located in Vienna, is a university focusing on natural resources. The university is dedicated to conducting research and teaching that enhances sustainability on all levels, appreciating the complexities of these challenges, pinpointing key issues, and formulating innovative solutions for today's world. The aim is to proactively address and resolve real-world issues, with a strong commitment to international perspectives and interdisciplinary approaches. The university consists of 15 departments and three scientific centers. It has several core facilities, including a core facility for bioinformatics which allows for computationally-heavy projects, and supports researchers with everything from large-scale analyses to common processing and analysis steps that require programming expertise.

We offer

- Work within an experienced, interdisciplinary, and international team at one of Austria's leading research institutes
- Ample opportunities to contribute and gain experience in a key area of biomedical research and precision medicine
- An inspiring workplace with an international setting, strong team spirit, and an excellent work climate
- A wide range of social, cultural, and sports activities organized by the institute
- Excellent employee benefits including full insurance coverage (health, accident, retirement), health care services, subsidized cafeteria
- Minimum monthly gross salary of EUR 4.752,30 for 40 hours paid out 14 times yearly (following the [recommendations of FWF](#)).
- Support for relocating to Vienna is provided (relocation reimbursement, visa support, etc.)

Your application

Please apply online (<https://cemm.onlyfy.jobs/job/gyq10ma9>) with a motivation letter explaining why you are the ideal candidate for this position, your curriculum vitae and contact details of 2-3 referees, all in a single PDF document with up to 3 pages.

Application deadline is April 14th, 2024, and the starting date will be summer 2024.

Additional information

City **Vienna**

Position type **Full-time employee**

Start of work **01.07.2024**

Responsible

Memo Mkhles

[Apply now](#)
