PhD position in glycobioinformatics

Project title: Unilectin - identification of lectins and prediction of specificity

A PhD studentship is available for 36 months from February or March 2021 as a co-tutelle thesis between the Universities of Grenoble Alpes and Genève (18 month salary in each institution). The teams of Dr A. Imberty at CERMAV- Grenoble and of Dr F. Lisacek at Proteome Informatics Group - Swiss Institute of Bioinformatics collaborate on the development of bioinformatics tools for the study of glycosciences, with complementary expertise. They already co-developed Unilectin, a new portal devoted to the structure, classification and prediction of lectins. The student will spend 18 months in each group.

Description

Lectins are proteins that interact non-covalently with carbohydrates reversibly and specifically while displaying no catalytic or immunological activity. Lectins are thought to have the ability to decipher the glycocode, i.e., the structural information present on complex carbohydrates at the cell surface. Lectins are involved in many biological processes, their interactions with carbohydrates often play an essential role to the onset, detection, and potentially prevention of human diseases such as cancer, inflammation, diabetes, neurodegenerative diseases and bacterial and viral infection. The UniLectin portal encompasses UniLectin3D, a database with more than 2000 3D-structures of lectins and LectomeXplore, a prediction tool based on the lectin structure classification to screen genomes.

Further development of the UniLectin platform is challenged in two domains: i/ content and usability: improvement is expected from extending lectin coverage, and adding new modules and ii/ outreach and integration: UniLectin tools should be used more widely in several communities, such as microbiologists or biochemists and integrated in a larger variety of other bioinformatics resources. The project includes extending the sequence coverage of lectins, modeling carbohydrate binding domains in the new lectins predicted in genomes, predicting specificity towards complex oligosaccharides, and improving lectin domain annotation.

Candidate profile:

We offer a PhD position for a student holding a master or engineering degree or any equivalent qualifications for the duration of 3 years. The successful candidate must demonstrate very good programming skills applied in bioinformatics (Java and Python). Good knowledge of database development and management (PostgreSQL) as well as some knowledge of data analysis and mining methods are expected. Experience in JavaScript is a plus. Finally, our international environment requires high proficiency in spoken and written English.

Required documentation:

- Motivation letter and Statement of purpose
- Curriculum vitae / Notes for the last 4 semesters
- References (at least two)

Selection process

The deadline for application is December 4, 2020. The applications should be sent to Anne.imberty@cermav.cnrs.fr and frederique.lisacek@sib.swiss