PhD position in cancer systems biology: Big Data vs brain cancer

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Uppsala University is an international research university focused on the development of science and education. Our most important assets are all the individuals who with their curiosity and their dedication make Uppsala University one of Sweden's most exciting work places. Uppsala University has 40,000 students, 7,000 employees and a turnover of SEK 6,5 billion.

The Department of Immunology, Genetics and Pathology at Uppsala University (**www.igp.uu.se**) has a broad research profile with several strong research groups focused on Genomics, Cancer and Molecular Diagnostics. Research is presently conducted in the following areas: Medical and Clinical Genetics, Immunology, Pathology, Medical Radiation Science, Tumor Biology and Vascular Biology. Parts of the organization are also integrated with the departments for Clinical Genetics, Immunology and Pathology-Cythology at Akademiska sjukhuset, Uppsala. The department provides a well-developed infrastructure for advanced molecular sciences. The Department has a yearly turnover of around 350 million SEK with a staff of around 340 people, 116 of which are PhD-students.

Project outline: Big Data methods for precision targeting of brain cancer
We are looking for a talented PhD student to help us develop new computational strategies to decipher the biology of brain tumors. Our laboratory (**nelanderlab.org**) is a cross-disciplinary team of 15 members. The group is built around a tight interaction between wet lab experimentation (e.g. cell and animal models), and dry lab computational work (e.g. data analysis and simulation). We are part of the Science for Life Laboratory, a frontier environment for molecular medicine in Sweden.

The analysis of cancer molecular data is one of the most urgent problems in current medical investigation. Our research deals with the use of innovative algorithms that combine several layers of genomic data, resulting in an accurate mathematical model of the tumor. Such models are useful, both as a groundbreaking tool to probe the biology of the tumor, and as a new device to predict therapies. In a pioneering effort, our lab has implemented a data generation program in which brain tumor (glioblastoma) cells from Swedish patients are analyzed on several different SciLifeLab technology platforms. Your task will be to participate in the analysis of these data, explore different integrative modeling strategies, and use the models to prioritize new molecular targets, or treatment combinations. You will subsequently work with experimental researchers on the team, who will evaluate your model predictions in cell and animal models. The ultimate goal of the project is thus to show that data translates into new therapeutic opportunities. The project will be supervised by Sven Nelander (cancer systems biology, Uppsala University) and co-supervised by Prof Rebecka Jörnsten (mathematical statistics, Chalmers). Hosted at a leading institute with strong resources, this PhD project provides a platform for a career in leading science environments, and offers an opportunity to develop expertise in medical data analytics. The project is further linked to an international consortium for precision medicine, and thus offers further opportunity to interact with leading experts at several institutes in Sweden, Germany, the United States and Australia.

Required qualifications

- MSc degree in a relevant area.
- Good or excellent programming skills (e.g. one or several of C++,Python,R,Matlab)
- Good or excellent knowledge of mathematical concepts relevant for bioinformatics (e.g.: linear algebra, statistics, probability theory, machine learning, control theory)
- Good command of written and spoken English.

Other important merits of relevance

- Documented experience of working in a cross-disciplinary team.
- Documented experience in bioinformatics or other big data analysis.
- Documented experience in cloud computing and/or deep learning methods
- Good or excellent knowledge of molecular or cancer biology.
- Other documented creativity in the area of computing.

The application should include a CV, copies of exams, degrees and grades, contact details of at least two references and a short description of the applicant and his/her experience. Letters(s) of recommendation may be included and are encouraged. If the

applicant has published scientific papers, they can also be included. You can only submit your application via the University portal (i.e. not by email).

Selection of applicants will be done by the future tutor for the selected student in consultation with the postgraduate study group of the Department. The Postgraduate Programmes Committee at the Disciplinary Domain of Medicine will formally approve the student's admission.

The successful candidate will devote most of the time towards his/her research level education. Other service activities within the department, e.g. education and administrative work can be included within the framework of the employment (maximum 20%). Salary will be set according to local guidelines at Uppsala University.

For further information about the position please contact Associate Professor Sven Nelander, sven.nelander@igp.uu.se

You are welcome to submit your application no later than 2017-06-06, UFV-PA 2017/1792.

We decline offers of recruitment and advertising help. We only accept the application the way described in the advertisement.

Placement: Department of Immunology, Genetics and Pathology
Type of employment: Full time , Temporary position longer than 6 months
Pay: Fixed pay
Number of positions: 1
Working hours: 100%
Town: Uppsala
County: Uppsala län
Country: Sweden
Union representative: Per Sundman, Saco-rådet 018-471 1485
Ellena Papaioannou, Seko 018-471 3315
Suzanne Borén Andersson, TCO/ST 018-471 6251
Number of reference: UFV-PA 2017/1792
Last application date: 2017-06-06

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