PhD Studentship in bioinformatics: Network Inference and Systems Biology

at the Stockholm Bioinformatics Center, located at Science for Life Laboratory in Stockholm, Sweden, with strong ties to a number of life science and computer science departments at Stockholm University, KTH, and Karolinska Institutet. The research project will be supervised by Professor Erik Sonnhammer (http://sonnhammer.org/).

The complex interplay between proteins, genes, metabolites, and other components make up the functional underpinnings of a living cell. The goal of this project is to develop computational algorithms and methods that use high-throughput biological data to build networks with details on how these components interact with each other. This is achieved by systems biology approaches such as building global association networks of functional coupling (see http://FunCoup.sbc.su.se/) and Gene Regulatory Network inference on perturbation-based gene expression data. There is an overlap between these types of networks which will be exploited in order to improve the quality and usefulness of both.

Methods include regression models, Bayesian integration, various statistical analyses, and in-house developed modelling techniques. In FunCoup, heterogeneous publicly available high-throughput data sources are combined to predict functional coupling between proteins in order to build global networks that model pathways and interaction cascades. The FunCoup links can serve as a prior when inferring regulatory networks in order to limit the search space. We are developing new algorithms for perturbation-based regulatory network inference with a focus on improving accuracy when using real data. The project involves programming, data analysis, benchmarking, and modelling, as well as application of the developed methods to experimental data generated by the group.

The successful candidate should be highly motivated and have an M.Sc. in bioinformatics or related field, and knowledge of molecular biology. Alternatively, an M.Sc. in molecular biology or related field and at least 1 year of practical experience in bioinformatics research and programming. Demonstrable familiarity with sequence and molecular data analysis techniques is essential. Computer programming (ideally R, Matlab, Perl, Python, Java, C, C++), UNIX skills, and knowledge of biological database systems are necessary merits.

To apply, send your CV, a cover letter, and the email address of 2-3 references to Erik.Sonnhammer@scilifelab.se. The position is fully funded for 4 years of full-time study and offers a competitive salary and excellent computational resources. For further information about the research project, contact Erik.Sonnhammer@scilifelab.se, Tel: +46-(0)70-5586395, http://sonnhammer.org