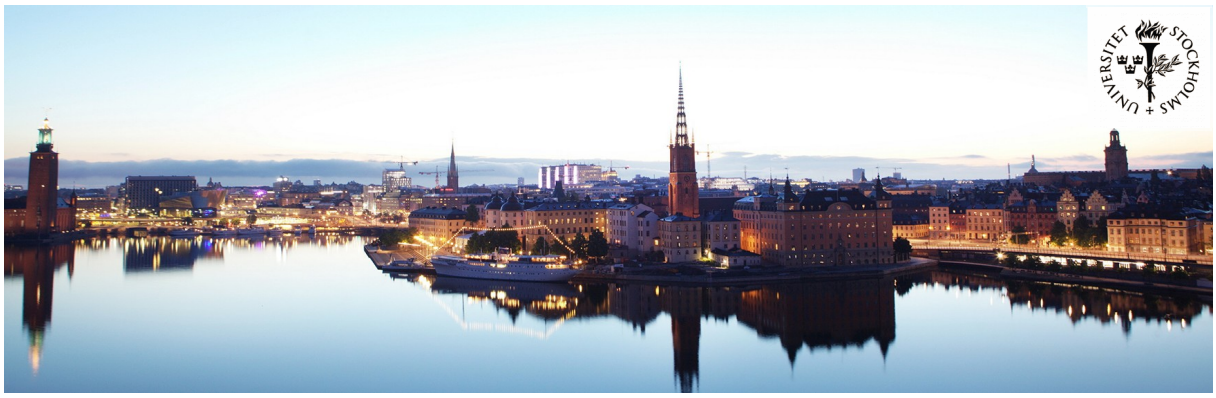

# PhD studentship in bioinformatics: Network-based protein function prediction

at the Science for Life Laboratory in Stockholm, Sweden, which is a strong research environment for large-scale life science research, and a joint physical center for a number of computational and life science groups at Stockholm University, KTH, and Karolinska Institutet. The research project will be supervised by Professor Erik Sonnhammer (http://sonnhammer.org/).

The goal of the project is to develop computational algorithms and methods that use high-throughput biological data to build comprehensive networks of how genes and their products interact with each other. We use systems biology approaches to build the FunCoup database of global association networks of functional coupling (http://FunCoup.sbc.su.se/). Networks can be used for statistical enrichment analysis of interactions between a query gene list and known pathways, which is much more sensitive than traditional gene overlap analysis. The project therefore also includes development and application of network-based pathway analysis methods.

Methods include regression models, Bayesian integration, various statistical analyses, and in-house developed modeling 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 project aims to expand FunCoup to also use physical regulatory evidence such as ChIP-Seq to infer regulatory links, and enzymatic activities to infer directed links. Structuring the networks into modules will be done to assign functions to network neighborhoods. The project involves programming, data analysis, benchmarking, and application of the developed methods to genes of particular interest in order to discover new protein functions.

The successful candidate must 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 documented practical experience in bioinformatics research and programming. Demonstrable familiarity with sequence and molecular data analysis techniques is essential. Computer programming with Java, Python, R, (Perl, 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 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