PhD Studentship:
Network Inference and Systems Biology

at the Stockholm Bioinformatics Center (http://www.sbc.su.se/), a joint center between Stockholm University and KTH (the Royal Institute of Techonology). The SBC is located at Science for Life Laboratory Stockholm (http://www.scilifelab.se/) and has excellent contacts with a number of life science and computer science departments at Stockholm University, KTH, and the Karolinska Institute. The research project will be supervised by Professor Erik Sonnhammer (http://sonnhammer.sbc.su.se/).

Cellular mechanisms depend on the complex interplay between proteins, genes, metabolites, and other components that constitute 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 approached both by building global association networks of functional coupling (see http://FunCoup.sbc.su.se/) and by Gene Regulatory Network inference based on perturbation data. There is an overlap between these types of networks which will be exploited in order to improve the quality and usefulness of both.

The methods include Bayesian Networks, Linear Regression, various statistical analyses, and own developed modeling techniques. In FunCoup, heterogeneous publicly available high-throughput data sources are combined to predict functional coupling between proteins in order to build networks that model pathways and interaction cascades. InParanoid (http://InParanoid.sbc.su.se/) orthologs are used extensively to transfer interaction data between species. The FunCoup links can serve as a prior when inferring regulatory networks in order to limit the search space. The project involves programming, data analysis, benchmarking, and modelling, as well as application of the developed methods to genes of particular interest in order to discover and validate new protein functions.

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 (e.g. Perl, Python, R), UNIX skills, and knowledge of biological database systems are necessary merits.

The position is for 4 years of full-time study and will be placed at the Department of Biochemistry and Biophysics, Stockholm University. Applications should be emailed to haidi@dbb.su.se marked “Ref. No. DBB 33-12” by **September 3**, 2012. For further information about the research project, contact Erik.Sonnhammer@sbc.su.se