# PhD Studentship: Functional Inference from Domain Architecture and Orthology

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/).

Proteins usually consist of some combination of recurring subsequences, corresponding to independently folding domains. Through mechanisms of domain shuffling, the domain composition of proteins can change, leading to situations where parts of a protein has a different evolutionary history than the whole.  In order to understand the functional impact of domain architectural features, this project aims to chart the evolutionary history of both individual protein domains and domain architectures.  This will be done in relation to orthology status, conservation of interaction partners, as well as versatility.  The overall aim is to establish the functional implications of different types of domain rearrangements.

The project includes both development of new algorithms and methods, as well as applications such as tools and workbenches to enable public access for database queries. The methods include hidden Markov models, clustering methods, various statistical analyses, and own developed algorithms. 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 new protein functions. See http://Pfam.sbc.su.se/ and http://InParanoid.sbc.su.se/.

The successful candidate should 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. Familiarity with sequence analysis techniques is essential, as well as a high level of motivation. 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 34-12" by **September 3**, 2012. For further information about the research project, contact Erik.Sonnhammer@sbc.su.se