



**Karolinska  
Institutet**



### **Post-doctoral Researcher in Bioinformatics**

**Position:** We have an opening for an individual wishing to join a multidisciplinary project in systems biology of inflammation. The successful candidate will be expected to develop bioinformatics approaches for the analysis of high throughput data from omics-based studies. Applicants should have a Ph.D. in a relevant discipline preferably bioinformatics, statistics, computer science or other quantitative field, with demonstrated experience in developing computational approaches to analyzing large datasets. We are especially interested in candidates with prior experience in network construction and statistical analysis, including the use of R and Bioconductor. Experience with multivariate statistics including the use of SIMCA-P+ or SAS as well as database construction would be an advantage.

**Research:** This project is a collaborative effort between the Karolinska Institutet and the Bioinformatics Center at Kyoto University. The overall project aims are to elucidate the mechanisms of chronic inflammatory diseases through integrated metabolomics, lipidomics, proteomics, and transcriptomics studies. Developed bioinformatics approaches will be employed in translational research to analyze patient samples from a range of inflammatory diseases, including asthma, chronic obstructive pulmonary disease (COPD), and atherosclerosis. Studies will be performed in close collaboration with clinicians at the Karolinska Hospital enabling the successful candidate to be directly involved in translational systems biology efforts. Collected data will be incorporated into relational database structures and analyzed with omics-integrating bioinformatics tools. We are specifically interested in the application of network analysis methods for linking disparate gene, protein and metabolite data from multiple biological compartments to construct a model of disease. The specific long-term aims of the project are to investigate the mechanisms of chronic inflammatory diseases from a systems perspective, towards the goal of understanding the etiology of disease pathology as well as its subsequent resolution.

**Environment:** The Department of Medical Biochemistry and Biophysics (MBB) has a strong research tradition that includes Pehr Edman who developed protein sequencing as well as three investigators who have received the Nobel Prize. The Karolinska Institutet is one of Europe's largest medical universities and contains commensurate resources and infrastructure. A total of 600 research groups span the full spectrum of medical disciplines and includes 2,000 researchers, 1,000 technicians, and 2,300 postgraduate students from all parts of the world who take part in both basic and clinical research.

The Kyoto University Bioinformatics Center (KUBiC) was established in 2001 to promote basic and applied research in bioinformatics, with focus on uncovering and utilizing the cellular functions of all organisms through the reconstruction of protein-protein interaction networks from genomic information. This approach is exemplified by their development of the KEGG (Kyoto Encyclopedia of Genes and Genomes) database. KUBiC is also responsible for operation of the GenomeNet database service with the support of massive parallel computing capability provided by a SGI Origin 3800.



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**Start date:** It is expected that the successful candidate will apply in collaboration with the Karolinska Institutet and Kyoto University for a postdoctoral fellowship from the Japanese Society for the Promotion of Science (JSPS, <http://www.jsps.go.jp/english/>). The application deadline for fellowships to initiate in fall 2010 is May 1<sup>st</sup>, 2010. The successful candidate can begin project work earlier at the Karolinska Institutet if desired, with the understanding that they will move to Kyoto University in the fall of 2010. Funding to begin at the Karolinska Institutet if desired is available from March 2010. The overall start date is negotiable, but it is expected that the candidate will begin at Kyoto University during the fall of 2010.

**Salary:** Salary at the Karolinska Institutet is stipend-based and includes health insurance. Salary at Kyoto University is according to JSPS regulations

**Applications:** Send applications, including research experience, CV and at least two references to Craig Wheelock ([craig.wheelock@ki.se](mailto:craig.wheelock@ki.se)). The position is open until filled, but applications should be received by January 31<sup>st</sup> for full consideration.

**Further Information:** For additional details of the departments and research interests:

<http://www.metabolomics.se/>

<http://www.mbb.ki.se>

<http://www.bic.kyoto-u.ac.jp/>

Interested candidates are referred to the following papers:

D Diez, ÅM Wheelock, S Goto, JZ Haeggström, G Paulsson-Berne, GK Hansson, U Hedin, A Gabrielsen, CE Wheelock, 2010. The use of network analyses for elucidating mechanisms in cardiovascular disease. *Molecular BioSystems* (in press, DOI: 10.1039/b912078e).

L Folkersen, D Diez, CE Wheelock, JZ Haeggström, S Goto, P Eriksson, A Gabrielsen, 2009. GeneRegionScan: A Bioconductor package for probe level analysis of specific, small regions of the genome. *Bioinformatics* 25(15):1978-1979.

CE Wheelock, ÅM Wheelock, S Kawashima, D Diez, M Kanehisa, M van Erk, R Kleemann, JZ Haeggstrom, S Goto, 2009. Systems biology approaches and pathway tools for investigating cardiovascular disease. *Molecular BioSystems* 5(6):588-602.

CE Wheelock, S Goto, L Yetukuri, FL D'Alexandri, C Klukas, F Schreiber, and M Orešič, 2009. Bioinformatics strategies for the analysis of lipids. In "*Lipidomics: Methods in Molecular Biology*". Editor: Donald Armstrong, Humana Press Inc, Totowa, New Jersey, USA 580:339-368.

CN Hayes, D Diez, N Joannin, W Honda, M Kanehisa, M Wahlgren, CE Wheelock, and S Goto, 2008. varDB: a pathogen-specific sequence database of protein families involved in antigenic variation. *Bioinformatics* 24(21):2564-2565.