Nature-inspired Smart Information Systems

NiSIS

JCB
JENA CENTRE FOR BIOINFORMATICS

NiSIS/JCB Spring School

Top-down Approaches in Systems Biology – Methods

4th May 2006
Jena, Germany

With the availability and ever increasing amounts of genomic, transcriptomic, proteomic and metabolomic data from living systems, top-down data analysis and modelling approaches are increasingly required to complement bottom-up approaches in systems biology today. While the latter are primarily knowledge-driven, the former are primarily data-driven. While bottom-up approaches are of a deductive nature analysing sub-systems in a detailed way, top-down approaches are of an inductive nature analysing whole systems in a global way. The strengths of top-down approaches lie in their potential to unravel interrelationships between sub-systems thereby uncovering 'missing links' and 'key players'. They provide hypotheses based on the analysed data which are then to be tested experimentally and fed back to improve bottom-up modelling in systems biology.

The School will focus on state-of-the-art methods for top-down systems biology. It will also address 'interfaces' to bottom-up systems biology approaches and demonstrate the benefits that can be gained by the interaction between the two. Since data-based reconstruction of networks plays a leading role in today's top-down approaches, special emphasis will be on methods of reverse engineering. In addition, data mining methods that can serve top-down systems biology will be addressed. The potential of these methods will be demonstrated on relevant applications in biology and medicine.

This School on top-down data analysis and modelling approaches will, in high-quality lectures, provide participants in a half-day course with up-to-date expert knowledge in this special strand of systems biology. It will have its particular focus on data-based modelling and systems identification from molecular and biomedical data. It will teach researchers and developers with a molecular, biological or medical background as well as those with an information processing background from research institutions and companies and also students of the life and the computer sciences in the use of advanced top-down methods in systems biology and their application in biology and medicine.

Organization: The School is jointly organized by the Leibniz Institute for Natural Product Research and Infection Biology - Hans Knoell Institute (www.hki-jena.de) and BioControl Jena GmbH (www.biocontrol-jena.com) with support from the European Co-ordination Action 'Nature-inspired Smart Information Systems' NiSIS (www.nisis.de) and the Jena Centre for Bioinformatics JCB (www.imb-jena.de/jcb).

Location: The School will take place at the Technologie- und Innovationspark Jena (TIP), Beutenberg-Campus, Wildenbruchstr. 15, D-07745 Jena, Germany, the day before the NiSIS/ JCB Workshop 'Top-down Approaches in Systems Biology - Applications' at the same location.

Fees: Participation in the School is free for NiSIS and JCB members. Non-members will have to pay a fee of EUR 60 (net plus 16% German VAT).

Registration: Deadline is 24th April 2006. To register for the School, please download, fill in and sign the form available from www.biocontrol-jena.com and return it by fax to +49-3641-675512. (*All* participants, including NiSIS and JCB members, are required to forward this registration.) There is a maximum of 35 participants. For further questions, please contact PD Dr R Guthke (reinhard.guthke@hki-jena.de) or Dr M Pfaff (michael.pfaff@biocontrol-jena.com).