

Computational systems biology of human and mouse mitochondrion metabolism in context of health and disease.

We offer a three years **Postdoc** position on **computational systems biology** of human and mouse mitochondrion metabolism in context of health and disease. The research will be part of our "**Center for Systems Biology and Bioenergetics**" (CSBB - <http://www.csb-bioenergetics.nl/>), which is part of the Radboud University Nijmegen Medical Centre in The Netherlands. The goal of the CSBB is to create an *in silico* model that can predict disease-related disturbances of energy homeostasis and the cellular consequences thereof and that can predict both on-target and off-target effects of pharmacological and nutritional interventions. The CSBB is a highly collaborative effort of computational biologists, experimentalists and clinicians to understand genetic disorders in energy metabolism which are on the basis of many different diseases such as cancer, genetic forms of Parkinson disease and drug-induced mitochondrial dysfunction.

The candidate will construct and apply muscle specific **genome-scale stoichiometric flux models** of human and mouse metabolism to understand systems-level effects of disorders in complex I of the mitochondrial oxidative phosphorylation (OXPHOS) system, because defects in this complex are the most frequently encountered cause of mitochondrial energy production disorders. We will exploit the extensive knowledge about human and mouse metabolism by modelling the energy metabolism's known components and their pathway relationships. The formalization of this knowledge in a stoichiometric network of, for example, human holds >50 years of legacy data consisting of 3742 reactions (16% of which mitochondrial), 1905 genes and 2766 metabolites. The candidate will work in very close collaboration with CSBB experimental laboratories which will generate specific and high quality transcriptomics, proteomics, metabolomics and fluxomics, to be integrated within a stoichiometric network of human and mouse. Moreover, the candidate will collaborate with computer scientists within the CSBB who develop efficient algorithms allowing for the integration of experimental data. Taken together, the candidate will be able to model and understand the systems-level effects of complex I disorders.

We support applications of ambitious and motivated Postdocs who want to work on computational systems biology within our CSBB. A strong background in cell (systems) biology (or biochemistry), bioinformatics, and/or computer science will be needed. Please send your CV, list of publications and two reference letters to Dr Richard Notebaart (R.notebaart@cmbi.ru.nl). The job will be on temporary basis for a maximum of three years. The gross month salary depends on the Postdoc's experience and will be based on a full-time appointment.