Systems Biology of Energy Metabolism

The Centre for Systems Biology & Bioenergetics (CSBB, www.csb-bioenergetics.nl) is an international centre housing 35 research groups from the Radboud University Nijmegen and its Medical Centre working together to model mitochondrial energy production, distribution and expenditure in the context of human disease. This Centre encompasses experts across many fields, including bio-informatics, physics, chemistry, physiology, pharmacology, biochemistry, clinical sciences and patient care, The multi-disciplinary nature of CSBB research ensures a stimulating and challenging research environment for ambitious researchers. Within the CSBB we are seeking:

9 Post-docs and 9 PhD students

Project: Modelling therapeutic interventions in mitochondrial bioenergetics.
For this project CSBB has received a grant of 4.5 MEuro from the Netherlands organisation for scientific research (NWO) and the Netherlands organisation for health research and innovation in healthcare (ZonMW).

Background:
A wide variety of human disorders are direct consequences of disturbed cellular energy homeostasis, no matter if the primary cause is environmental or genetic. Despite tremendous progress in our understanding of the molecular processes underlying cellular energy production and distribution, current knowledge of the relation between disturbed cellular energy regulation and overall clinical phenotype is still very limited. The latter is probably best illustrated by the adverse, energy homeostasis-related side effects of a series of medicines, like nucleoside analogues in HIV treatment, and by the essential lack of medicines that can positively counteract the consequences of disturbed energy homeostasis. The list of human diseases and conditions that involve disturbances in cellular energy homeostasis holds many examples of great socio-economic importance such as various forms of cancer, genetic forms of Parkinson disease, drug-induced mitochondrial dysfunction, nutrient deficiencies, hypoxia-related injuries and even the normal process of aging.

Within the CSBB, we will develop and validate tissue-specific computational models that will be used for the systems-level prediction of energy-related consequences of disease and of pharmacological and nutritional interventions. To this end, a wide variety of cutting edge techniques will be applied including cell and molecular biological, genetics, proteomics, metabolomics, biochemical, pharmacological and physiological procedures as well as state-of-the-art imaging techniques such as live cell confocal microscopy and MRI.

Various research projects are available within the three major lines of the project:.

- **Bioinformatics, specifically data modelling of energy metabolism in skeletal muscle cell mitochondria**
- **In vitro & in vivo analysis of mitochrondrial function in healthy and disease models using techniques such as:**
    - **Molecular kinetics analysis**
    - **High content microscopy**
    - **Transcriptomics**
    - **Proteomics**
    - **Metabolomics and fluxomics**
- **Investigation of the bioenergetic effects of therapeutic (drugs and nutraceuticals) intervention strategies**

Requirements:

- PhD Students with an M.Sc. in (Medical) Biology, Molecular Life Sciences, Biomedical Sciences, Bioinformatics or similar degree can apply.
- Post-doc: A PhD in (medical) biology or bioinformatics

Candidates must have a good scientific background and should be

- Highly motivated
- Well-organized
- Independent and exhibit a team player attitude
- Social and show good communicative skills

Closing date:
Post-docs: Ongoing
PhD students: Ongoing.

Further information and contact:
Further information can be obtained from Dr. A. Cohen (+31-24-3610707). Applicants should send a letter of intent outlining special interest in the position, overall related qualifications, experience and career goals, a curriculum vitae, including a list of publications, and names and addresses of 2 professional references to a.cohen@ncmls.ru.nl. The CSBB website is available via www.csb-bioenergetics.nl.

PhD students may also apply via the NCMLS PhD recruitment initiative, Talent Event taking place **15th - 17th September 2010**. The deadline for application is **1st July 2010.** Application is via the NCMLS PhD Talent Event website: www.ncmls.eu/talentevent. For specific information about Talent Event also contact Dr. A. Cohen.