

**Title**

Understanding hierarchical and metabolic regulation of metabolic networks through Bayesian constraint modeling

**Research**

Living cells are able to carry out a large number of reactions, which are all connected within a metabolic network. Recently, our understanding of *how* such a network is regulated at the different levels of cellular organization (genes, proteins, metabolites), has increased substantially. Yet, there is still a surprising lack of knowledge as to *why* steps in a pathway are regulated the way they are.

**Job description**

In this project, we will combine kinetic modeling with machine learning techniques to investigate different regulation scenarios and their impact on metabolism, providing a context for interpreting experimentally observed regulation in *Saccharomyces cerevisiae* and *Lactococcus lactis*. These two organisms are intensively studied within the Kluyver Center in which the research groups participate, and kinetic models of primary metabolism have been developed. The PhD student (based in Delft) will focus on machine learning, parameter uncertainty propagation and dynamic constraints.

**Location**

This project will be carried out at the Information & Communication Theory Group at Delft University of Technology. The Bioinformatics section of the Information & Communication Theory Group specialises in data-driven bioinformatics research in collaboration with researchers in medicine, molecular biology and biotechnology.

**Requirements**

Candidates should fulfill the following criteria.

MSc. in (micro)biology, biochemistry, systems biology, engineering, physics or mathematics

experience with or affinity for biological applications is an asset

able to work independently but as part of a multidisciplinary team

**Conditions of Employment**

We offer a full-time PhD position for 12 months. After a successful evaluation the contract will be prolonged with 36 months.

The salary is according to the standards for PhD positions and is starting at €2000,- in the first year to €2.558,- in the last year of appointment, based on a fulltime employment.

**Contact**

Dr. ir. Dick de Ridder

TU Delft, EWI

Mekelweg 4

2628 CD DELFT

The Netherlands

phone +31 15 2785114  
mail [d.deridder@tudelft.nl](mailto:d.deridder@tudelft.nl)

or Prof. dr. ir. Marcel Reinders  
TU Delft, EWI  
Mekelweg 4  
2628 CD DELFT  
The Netherlands

phone +31 15 2786424  
mail [m.j.t.reinders@tudelft.nl](mailto:m.j.t.reinders@tudelft.nl)

**Website**

<http://www.tudelft.nl>

**Applications**

Written applications in English should be sent to the Vrije Universiteit, Dr. J.M.R.M. Neutelings, Managing Director, Faculty of Earth and Life Sciences, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands or by e-mail to [falw-vacatures@falw.vu.nl](mailto:falw-vacatures@falw.vu.nl), with the vacancy number 1.2008.00183 on the letter and the envelope, or in the e-mail subject line.

**Closing time**

August 1, 2008