



Netherlands Organisation for Scientific Research



Gene regulation in higher eukaryotes: A combined approach of quantitative experiments in living cells and mathematical modelling

The project is financed by the Dutch Organization of Scientific Research (NWO) and the Netherlands Institute for Systems Biology (NISB; www.sysbio.nl) and are situated within the Swammerdam Institute for Life Sciences, University of Amsterdam (Living Cell Theme) and NISB. The PhD project builds on extensive expertise in the research groups of Dr. Verschure (UvA) and Dr. Bruggeman (NISB) to investigate (epi-)genetic control of gene expression in mammalian cells by (i) integrating molecular-cell biology technologies and advanced microscopy analysis and (ii) mathematical modeling of key regulatory mechanisms of gene activity. The present project is embedded in a team of PhD students embedded in the groups of Dr. Verschure and Dr. Bruggeman working on closely related projects using a combined approach of quantitative experiments in living cells and mathematical modelling. This team of PhD students allows for strong competitive systems-biology research integrating experimentation, modelling and theory. This will be the first time that eukaryotic (epi-)genetic gene control is addressed in such an interdisciplinary and integrative approach.

PhD student full time (38 hours per week), vacancy number 08-1066

Research project: *An engineered synthetic system to understand the complex behaviour of (epi-)genetic gene control systems*

Gene regulation relies on a myriad of macromolecular components that jointly orchestrate gene expression that specifies cell adaptation, physiological state and cell type. Research to unravel gene control systems is a main focus in contemporary cell biology particularly since (epi-)genetic control systems are potential drug targets to enable treatment of disease-related gene dysregulation. The advertised PhD-student project aims at elucidating principles that govern functioning of (epi-) genetic gene regulation in higher eukaryotes using a systems-biological approach combining experimentation and computational modeling.

Synthetic engineered gene circuits are created that consist of mammalian cells carrying episomal vectors that have the potential to regulate (epi-) genetic control in small gene networks. The created synthetic gene circuits allow systematic and quantitative measurements of the change in transcription rate as function of the (epi-) genetic status of the chromatin. Mathematical models are generated to give insight into the general behaviour of the synthetic systems.

Requirements

The candidates should be highly motivated and preferentially have good experience with basic molecular biology techniques, good organization skills and good writing and oral communication skills in English. Candidates should have a master's degree in Biochemistry, Cell biology, or Molecular biology (or equivalent) and should be open for mathematical modeling approaches. The candidate should be willing to work in an interdisciplinary project and institute (Netherlands Institute of Systems Biology).

More information

Project information can be obtained from: Dr P.J. Verschure, e-mail: pj.verschure@science.uva.nl; phone 0031-(0)20-525-5151

Appointment

The appointment will be on a temporary basis for a maximum period of four years (18 months plus a further 30 months after positive evaluation) and should lead to a dissertation (PhD thesis). An educational plan will be drafted that includes attendance of courses and (international) meetings. The PhD student is also expected to assist in teaching of undergraduates.

Based on a full-time appointment (38 hours per week) the gross monthly salary will range from € 2000,- in the first year and € 2558,- in the final year, according to the Dutch salary scales for PhD students.

Job application

Applications, quoting the vacancy number and marked "strictly confidential" (in the upper left-hand corner of the envelope) should include a *curriculum vitae* and the names and addresses of three references from which information about the candidate can be obtained. The application should be sent to the Personnel Department, University of Amsterdam, Faculty of Science, Kruislaan 404, 1098 SM Amsterdam, the Netherlands. Applications can also be e-mailed to application@science.uva.nl, also bearing the vacancy number and the other documents as attachments.

The closing date for application is 1 November 2008.

University of Amsterdam

The University of Amsterdam (UvA) is one of Europe's leading institutions for higher education. It participates in the international science network by collaborating with major universities throughout the world. The Faculty of Science is one of Europe's foremost institutions for higher education and research in its chosen fields of specialization. It plays an active role in international science networks and collaborates with universities and industry. The Faculty has approximately 2000 students and 1500 staff members spread over four departments and ten research institutes. Each institute has its own research programme, a substantial part of which is externally financed by the Netherlands Organization for Scientific Research (NWO), the Dutch government, the EU and various private enterprises.

The Swammerdam Institute for Life Sciences (SILS) is the Faculty's largest institute. Its approximately 250 scientists and staff members work in 11 research groups that perform excellent research centered on four themes: 1) The Living Cell, 2) Plants and Health, 3) Inside and Beyond the Brain, and 4) Life Science Technologies.

Netherlands Institute for Systems Biology (www.sysbio.nl)

The Netherlands Institute for Systems Biology involves research groups from AMOLF (physics institute; www.amolf.nl), Centre for Mathematics and Computer Science (CWI; www.cwi.nl) and biology department from the University of Amsterdam (UVA; www.uva.nl) and Vrije Universiteit (Amsterdam; www.vu.nl). The institute systems-biological research is carried out integrating experimental biology with mathematics and physics. It involves renowned groups in biology, systems biology, physics and mathematics.