

Design and dynamics of intracellular signalling algorithms

<p>Research / Job description</p>	<p>Living cells sense and respond to their environment by an intricate web of molecular interactions. Inasmuch as their designs are dictated by the problems they solve, such networks can be considered primitive algorithms derived by natural selection.</p> <p>The aim of this project is to link the temporal dynamics of intracellular signalling networks to the constraints imposed by behavioural performance and evolution. Bacteria can serve as an excellent vehicle for probing such questions, as the time scales involved in signalling, behaviour and evolution are all amenable to laboratory experiments. We will use fluorescence resonance energy transfer (FRET) microscopy to probe molecular responses to dynamically varying chemical stimuli in living bacterial cells. Such measurements constrain mechanistic models of signalling, the parameter space of which can be explored experimentally by genetic alterations of the organism. At the level of cell behaviour, performance of specific networks and parameter sets will be tested by video microscopy of single cells and populations in purpose-built microfluidic chambers. The plasticity of algorithms over evolutionary time scales will be quantified by calibrated comparisons of parameter sets among bacterial strains evolved in the laboratory and those isolated from the wild.</p>
<p>Location</p>	<p>The FOM Institute for Atomic and Molecular Physics (AMOLF) performs leading fundamental research on physics of Biomolecular Systems and Nano Photonics; two areas with key potential for technical innovations. The Institute contributes to knowledge transfer to industry and society and trains talented young researchers. AMOLF is located at Science Park Amsterdam, The Netherlands, and engages approximately 130 scientists and 50 support staff. See also www.amolf.nl</p> <p>The System Biology group at AMOLF is focusing on Physical Systems Biology and will begin operations in February, 2009.</p>
<p>Required qualifications</p>	<p>We seek outstanding candidates with a background in physics, engineering, mathematics or quantitative/systems biology. Experience/knowledge in biophysics, statistical mechanics, stochastic dynamics, control theory and feedback is a plus, but a greater emphasis will be placed on the calibre and drive of the individual. PhD candidates must meet the requirements for an MSc-degree. Postdoc candidates must meet the requirements for a doctors-degree.</p>
<p>Terms of employment</p>	<p>The position is intended as full-time (38 hrs / week, 12 months / year) appointment in the service of Foundation for Fundamental Research on Matter (FOM) for the duration of two (postdoc) or</p>

	<p>four (PhD) years. After successful completion of the PhD research a PhD degree will be granted at a Netherlands university. Several courses are offered, specially developed for PhD-students. AMOLF assists any new foreign employees with housing and visa applications and compensates their transport costs and furnishing expenses.</p>
<p>For further information please contact</p>	<p>Dr. Tom Shimizu E-mail: t.shimizu@seebelow *</p>
<p>Applications can be send to</p>	<p>FOM Institute AMOLF Personnel dept. Postbus 41883 1009 DB Amsterdam The Netherlands application@seebelow * Please quote vacancy # 0810.26</p> <p>Please send your:</p> <ul style="list-style-type: none"> - Resume; - Motivation on why you want to join the group (max. 1 page). <p>Applications without this motivation will not be taken into account. However, with this motivation your application will receive our full attention.</p> <p>* Replace seebelow by amolf.nl</p>