



## **Invitation to Colloquium**

**Speaker:** Prof. Dr. Joerg Stelling (ETH Zurich)

**Title:** Computational Engineering of Synthetic Genetic Circuits

**Date:** Thursday, 02<sup>nd</sup> December 2010 at 04:00 p.m.

**Location:** Max Planck Institute  
Conference area, ground floor, room no. V 0.05.2  
Sandtorstr. 1  
39108 Magdeburg

### **Abstract:**

Ultimately, synthetic biology aims at establishing novel, useful biological functions by suitably combining well-characterized parts. Especially when complex circuits – in terms of the number of components and interactions involved, or with respect to the dynamic behavior – are to be designed, computational engineering methods have to be an integral part of the approach.

This talk will focus on engineering concepts to achieve scalability and robustness (relative insensitivity to external or internal perturbations of the designed circuits). Both are important concerns for the field because the biology-based parts employed are not (yet) well-characterized, the circuits have to operate in a noisy (cellular) environment, and they cannot be completely isolated from, e.g., a cellular context.

More specifically, major open issues exist regarding (i) principles of circuits design with standardized parts, and (ii) principles for the design of robust performance of synthetic circuits. ‘Classical’ synthetic genetic circuits as well as novel systems such as a tunable synthetic oscillator in mammalian cells will be discussed as prototypical examples to illustrate our current capabilities. In perspective, synthetic approaches do not only have the potential of major impacts in different application areas, but also present challenging problems for engineering design.

**Of course, everyone interested in the talk is invited to come.**