

Cologne Evolution Colloquium

SFB 680
Molecular Basis of
Evolutionary Innovations

Roshan Prizak
IST Austria

Evolution of new regulatory functions on biophysically realistic fitness landscapes

Gene expression is controlled by networks of regulatory proteins that interact specifically with external signals and DNA regulatory sequences. These interactions force the network components to coevolve so as to continually maintain function. Yet, existing models of evolution mostly focus on isolated genetic elements. In contrast, we study the essential process by which regulatory networks grow: the duplication and subsequent specialization of network components. We synthesize a biophysical model of molecular interactions with the evolutionary framework to find the conditions and pathways by which new regulatory functions emerge. We show that specialization of new network components is usually slow, but can be drastically accelerated in the presence of regulatory crosstalk and mutations that promote promiscuous interactions between network components.

Wednesday, February 8, 2017, 17:00
University of Cologne, Institute for Genetics
Seminar Room 0.46

Hosted by Michael Lässig