SFB 680

Molecular Basis of Evolutionary Innovations

Molekulare Grundlagen evolutionärer Innovationen

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The resolution of adaptive conflicts by functional promiscuity and gene duplication

Ongoing theoretical and experimental developments in the area of protein evolution emphasise the importance of functionally promiscuous, or multi-functional, ancestors and the possibility of proteins that can assume more than one stable structural state. A recently popularised model of protein evolution is the `Escape from an Adaptive Conflict' (EAC), a type of subfunctionalisation. This conflict of a single gene to adapt to more than one selection pressure can lead to a certain degree of multi-functionality prior to a gene duplication event. After duplication, the resulting paralogs are thought to specialise on different sub-functions of their ancestor. Here, using a simple biophysical protein model and taking structural stability as an indicator for biological activity, we demonstrate under which conditions adaptive conflicts on a dual fitness landscape can be resolved by multi-functionality, gene duplication and subfunctionalisation.

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4:00 p. m.

Institute for Genetics, Lecture Hall, 4th floor

Hosts: Joachim Krug and Markus Porto

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