



Institute colloquium

The Institute Colloquium

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Host:

Although it is often tacitly assumed that gene regulatory interactions are finely tuned, how accurate gene regulation could evolve from a state without regulation is unclear. Moreover, gene expression noise would seem to impede the evolution of accurate gene regulation, and previous investigations have provided circumstantial evidence that natural selection has acted to lower noise levels. I will discuss how, by evolving a large library of synthetic *E. coli* promoters de novo, and comparing the noise properties of these synthetic promoters with those of native *E. coli* promoters, we found that, contrary to expectations, synthetic promoters naturally exhibit low noise.

That is, low noise is the default state of *E. coli* promoters, implying that selection must have acted to increase the noise levels of a subset of *E. coli* promoters that are characterized by large expression plasticity and large numbers of regulatory sites. I will present a general theory of the interplay between gene expression noise and gene regulation that explains these observations. The theory shows that propagation of expression noise from regulators to their targets is not an unwanted side-effect of regulation, but rather acts as a rudimentary form of regulation that facilitates the evolution of more accurate regulation.

Monday, November 23, 2015 12:45pm - 02:00pm

Raiffeisen Lecture Hall, Central Building



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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