ELSC-ICNC Seminar: Nathalie Balaban

February 24, 2011

Linking genotype, phenotype, and fitness: a molecular mechanism for implementing stochastic strategies to cope with stress

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On the topic of:

Linking genotype, phenotype, and fitness: a molecular mechanism for implementing stochastic strategies to cope with stress

ELSC-ICNC lecture hall (Silverman Bldg., Wing 3, 6th floor - Edmond J. Safra Campus)
February 24, 2011, at 17:30

Abstract:

Non-genetic individuality has been observed, even in homogeneous environmental conditions, in a wide range of biological processes including differentiation and stress response. A striking example is the heterogeneous response of bacteria to antibiotics, whereby a small fraction of drug-sensitive bacteria can persist under extensive antibiotic treatments. We had previously shown that persistent bacteria enter a phenotypic state, identified by slow growth or dormancy, which protects them from the lethal action of antibiotics. By measuring the effect of this non-genetic individuality on survival under antibiotic or phage stress, we show that the co-existence of two disparate growth phenotypes within an isogenic population can provide a strategy to cope with stress. Finally, we present an experimental dissection of a network that enables the molecular implementation such a bet-hedging strategy.
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