

MAR12-2011-000271

Abstract for an Invited Paper
for the MAR12 Meeting of
the American Physical Society

Uncovering principles of cellular decision-making

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Cells can cope with unpredictable environmental conditions by differentiating into appropriate states. In this talk, I will present our recent attempts to understand the role of genetic circuits in regulating the underlying process of cellular decision-making. Specifically, we are interested in how interactions within and across genetic circuits enable cells to choose among alternative fates. To address this question my laboratory is employing systems and synthetic biology approaches. Our ultimate goal is to uncover possible evolutionary pressures that may have selected for specific gene circuit architectures, dynamics and noise properties.