Colloquium

Information flow in cell signaling networks

Dr. Andrew Mugler
Emory University

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Room 118 Nieuwland Science Hall

Biochemical networks are the computational units of life. Networks underlie everything a cell does, from sensing its environment, to processing information, to executing behaviors. At the physical level, these networks describe interacting molecules, which are subject to fundamental physical constraints, such as shot noise and diffusion. I will show how a functional understanding of signaling networks can be obtained using physical models that respect these constraints. In particular, I will discuss information flow in a mammalian sensory network, and I will describe how the spatiotemporal organization of molecules affects the sensory ability of the cell. Information flow in other signaling networks, such as a cell-to-cell communication network, and a transcriptional decision-making network, will also be discussed.

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