Abstract Submitted
for the 4CF14 Meeting of
The American Physical Society

Using information theory to derive an effective model of the Wnt cell-signaling pathway DANE BJORK, MARK TRANSTRUM, None — Microscopically, biological signaling pathways, such as the Wnt pathway, can be very complex, involving a large number of bio-chemical reactions organized to perform specific cellular functions. This complexity is characterized by a large number of unknown parameters that remain unconstrained by experimental data. This complexity is furthermore a bottleneck to understanding the emergent mechanisms that drive the system's functionality. Recent work in information theory has shown that in spite of this complexity, most of the system's behavior is compressed into a small number of important (relevant) parameters. We use information theory to identify these parameters in a model of the Wnt signaling pathway and to derive an effective, simplified model of the system. We compare our results with other attempts to identify effective models from the literature.

Dane Bjork
None

Date submitted: 11 Sep 2014 Electronic form version 1.4