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Positive feedback based differentiation switches in simple organisms

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Abstract

Bacteria and yeast, in spite of being thought of as rather primitive single cell organisms, can display complex traits and switch between distinct modes of response to their environment. The molecular scale decision processes are complex, involving interesting interplays between single cell and population responses. Using a combination an integrative modeling-experimental approach, we analyze two instanses of switch-like decision processes in bacteria and yeast: quorum sensing and mating. In this presentation, I will discuss some of the salient points of the genetic control underlying both of these important modes of behavior, indicating how a complex and extensive set of useful properties might arise from inter-woven feedback reactions.