

A Model of the Cellular Resource Allocation Strategy in Bacteria

The central target of the bacterial life is to survive, and one of the central task to achieve this target is for the bacterial cell to grow. The machine which is responsible for performing the bulk of this task is the Ribosome. However, it not only has to produce all the required proteins of the cell but also copies of itself, to be divided among its daughter cells so as to keep this process self sustaining. In doing so, it has to decide on how much it should dedicate itself to produce its copies in comparison to producing the metabolic proteins needed to provide the fuel for this task, apart from other proteins. We present a simple, biologically motivated, mathematical model which incorporates this trade-off and shed some understanding on the nature of the control implemented by the bacteria in taking this decision.

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