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Linking lineage and population observables in biological branching processes

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Using a population dynamics inspired by an ensemble of growing cells, a set of fluctuation theorems linking observables measured at the lineage and population levels are derived [1]. One of these relations implies specific inequalities comparing the population doubling time with the mean generation time at the lineage or population levels. While these inequalities have been derived before for age controlled models with negligible mother-daughter correlations, we show that they also hold for a broad class of size-controlled models. We discuss the implications of this result for the interpretation of a recent experiment in which the growth of bacteria strains has been probed at the single cell level.

[1] Linking lineage and population observables in biological branching processes,
<https://www.biorxiv.org/content/10.1101/527291v1>

Choix de session parallèle

2.4 Fluctuation et biologie

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