Abstract Submitted
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Functional trade-offs and phenotypic diversity in cellular migration[1] THIERRY EMONET, NICHOLAS FRANKEL, YANN DUFOUR, Yale University — I will discuss our recent efforts to uncover the functional role of phenotypic heterogeneity in cellular migration and understand how biological systems may resolve functional trade-offs. We addressed this question using bacterial chemotaxis as model system. We find (1) that, while robust network design maintains the average behavior of the population in a functional range, harnessing inherent cell-to-cell variability around the average allows populations to adaptively diversify network functions, resolving trade-offs; and (2) that the molecular mechanism for directing this diversity is mutations in common gene regulatory elements. Our main theoretical conclusion is that the distribution of network parameters in itself is as likely to be under selection as network design.

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