

Abstract Submitted  
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**The functional consequences of non-genetic diversity in cellular navigation**<sup>1</sup> THIERRY EMONET, ADAM J WAITE, NICHOLAS W FRANKEL, YANN DUFOUR, JESSICA F JOHNSTON, Yale University — Substantial non-genetic diversity in complex behaviors, such as chemotaxis in *E. coli*, has been observed for decades, but the relevance of this diversity for the population is not well understood. Here, we use microfluidics to show that non-genetic diversity leads to significant structuring of the population in space and time, which confirms predictions made by our detailed mathematical model of chemotaxis. We then use genetic tools to show that altering the expression level of a single chemotaxis protein is sufficient to alter the distribution of swimming behaviors, which directly determines the performance of a population in a gradient of attractant, a result also predicted by our model.

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