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Cell size control in microorganisms

ARIEL AMIR, Harvard University

Organisms in all kingdoms of life face a challenge of regulating the size of their cells, control of which is essential for their viability. How do cells decide when to divide? For decades, a popular hypothesis has been that cells can measure their absolute size, and that reaching a critical size triggers the division process. This would imply that a cell that was born smaller than average will not be smaller than average when it divides - in contrast to experiments showing that such correlations exist, and that size is partly inherited. I will present a biophysical model that sheds new light on this problem, showing that a cell does not need to know its absolute size to regulate size robustly, quantitatively explaining the experimentally measured correlations in both E. coli and budding yeast, and predicting that average cell size should depend exponentially on the growth rate.