

**Title: Do single cells have clocks that synchronize?**

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**Abstract:**

Many organisms have a biological clock that allows them to adapt to the light-dark cycle of the planet. Most measurements on biological clocks are made at the microscopic level of 10<sup>7</sup> cells or more. Recent advances in nanotechnology permit the measurement of gene expression in single cells. At the single cell level gene expression is highly stochastic; yet the collective behavior of 10<sup>7</sup> cells displays highly synchronized circadian rhythms in a diversity of organisms. For the first time we examine in a model system, *Neurospora crassa*, how single cells with asynchronous oscillators transition to a highly synchronized collection of oscillating cells.