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**02 October 2018**

**How a common bacterium evolves to become a chronic problem**

Of the many health complications plaguing individuals with cystic fibrosis (CF), one of the most devastating is chronic infection of the airways by the bacterium *Pseudomonas aeruginosa*. While the bacterium is ubiquitous in the environment and is rarely problematic for healthy individuals, once it gets a foot-hold in CF patients the only cure is a lung transplant. But how and why *P. aeruginosa* becomes such a problem for these patients remains a mystery.

New research from Alana Schick and Rees Kassen at the University of Ottawa that will be published this week in *Proceedings of the National Academy of Sciences USA* (<https://doi.org/10.1073/pnas.1721270115>) provides an important clue: it may be the ability of this bacterium to diversify that is the key to its forming long-term infections.

The researchers tracked the evolution of the bacterium in laboratory conditions mimicking the nutritional conditions of the CF lung. The populations quickly diversified into many different forms, including those seen in isolates of *P. aeruginosa* from CF patients. The results point to the range of nutrients available to *P. aeruginosa*, rather than other features of the CF lung like immune responses or competitor microbes, as the main driver of diversification.

The authors speculate that it is this diversity that ultimately causes chronic infections. The many different variants of *P. aeruginosa* evolving in the lung means there is the potential for a subset to have the right combination of characteristics to form chronic infections. If so, then one tool for managing infections by *P. aeruginosa* will be to find ways to prevent or manage evolutionary diversification.

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Further information on this and related work can be found from the Kassen lab website at <http://kassenlab.weebly.com/> and in this blog by Jessa Gamble: <http://www.lastwordonnothing.com/2017/04/28/island-biogeography-applies-in-your-body/>.

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