

# United we stand; divided we fall

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In the July 15th issue of G&D, Dr. Roberto Kolter (Harvard Medical School) and colleagues make the unprecedented observation of paracrine signaling during *Bacillus subtilis* biofilm formation.

The Gram-positive soil bacterium, *B. subtilis*, relies on quorum sensing and the signaling molecule, surfactin, to trigger extracellular matrix production and biofilm formation at critical cell densities. Dr. Kolter and colleagues demonstrated that a process of stochastic differentiation takes place during biofilm formation leading to a subpopulation of cells that produces surfactin.

Strikingly, the cells that produce surfactin are, themselves, unable to respond to it, while the cells that respond to surfactin become unable to produce it. Paracrine signaling represents a novel mechanism to maintain two differentiated cell populations within this larger bacterial cell community.

While *B. subtilis* is not, itself, a pathogenic agent, Dr. Kolter is confident that "Knowing that different subpopulations arise not only by stochastic processes but also by directional cell-to-cell signaling opens the door for the development of strategies that would reverse the differentiation in, for example, antibiotic persister cells."

Source: Cold Spring Harbor Laboratory ([news](#) : [web](#))

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