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Chemotaxis in P. Aeruginosa Biofilm Formation SAMUEL BIENVENU, SHINJI STRAIN, TRAVIS THATCHER, VERNITA GORDON, UT Austin — Pseudomonas biofilms form infections in the lungs of Cystic Fibrosis (CF) patients that damage lung tissue and lead to death. Previous work shows chemotaxis is important for Pseudomonas in CF lungs. The work studied swimming bacteria at high concentrations. In contrast, medically relevant biofilms initiate from sparse populations of surface-bound bacteria. The recent development of software techniques for automated, high-throughput bacteria tracking leaves us well-poised to quantitatively study these chemotactic conditions. We will develop experimental systems for such studies, focusing on L-Arginine (an amino acid), D-Galactose (a sugar present in lungs), and succinate and glucose (carbon sources for bacteria). This suite of chemoattractants will allow us to study how chemoattractant characteristics– size and diffusion behavior–change bacterial response; the interaction of competing chemoattractants; and, differences in bacterial behaviors, like motility modes, in response to different types of chemoattractions and varying neighbor cell density.

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