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A microscopic image of Pseudomonas aeruginosa colonies. The colonies are arranged in a dense, overlapping pattern, showing a characteristic rugose (wrinkled) morphology. The color is a mix of reddish-brown and pinkish-orange, with some darker, almost black, areas. The background is a light, yellowish-orange color.

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Elevated exopolysaccharide levels in *Pseudomonas aeruginosa* flagellar mutants have implications for biofilm growth and chronic infections

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Flagellar mutants of the opportunistic bacterial pathogen *Pseudomonas aeruginosa* display nutrition-dependent rugose colony morphology.

Pictured is *Pseudomonas aeruginosa* strain AMT0113-12, an isolate from the sputum of a cystic fibrosis (CF) patient with chronic lung infection. This strain expresses a rugose colony phenotype on Vogel-Bonner Minimal Medium-based agar (shown here) that is not expressed on widely used lysogeny broth agar. This observation led to the discovery that flagellar mutations are linked to a similar gain-of-function (exopolysaccharide-overproducing) phenotype. While it has been assumed that a primary benefit from loss of motility is that the host immune system fails to target a bacterium lacking a flagellum, this observation suggests that exopolysaccharide-overproduction by flagellar mutants may also have fitness benefits in chronic infections and biofilms.

Image credit: Joe J. Harrison and Matthew R. Parsek.