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Pili-taxis: Clustering of *Neisseria gonorrhoeae* bacteria JOHANNES TAKTIKOS, Technical University Berlin, Germany, VASILY ZABURDAEV, Harvard University, NICOLAS BIAIS, Columbia University, HOLGER STARK, Technical University Berlin, DAVID A. WEITZ, Harvard University — The first step of colonization of *Neisseria gonorrhoeae* bacteria, the etiological agent of gonorrhea, is the attachment to human epithelial cells. The attachment of *N. gonorrhoeae* bacteria to surfaces or other cells is primarily mediated by filamentous appendages, called type IV pili (Tfp). Cycles of elongation and retraction of Tfp are responsible for a common bacterial motility called twitching motility which allows the bacteria to crawl over surfaces. Experimentally, *N. gonorrhoeae* cells initially dispersed over a surface agglomerate into round microcolonies within hours. It is so far not known whether this clustering is driven entirely by the Tfp dynamics or if chemotactic interactions are needed. Thus, we investigate whether the agglomeration may stem solely from the pili-mediated attraction between cells. By developing a statistical model for pili-taxis, we try to explain the experimental measurements of the time evolution of the mean cluster size, number of clusters, and area fraction covered by the cells.

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