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## Swimming vs gliding: Exploring the first steps of biofilm formation of motile microbes

Cilia and flagella are cellular appendages that enable microorganisms to propel themselves and interact with surfaces. Particularly, the unicellular microalga *Chlamydomonas reinhardtii* swims by actuating its two flagella, but it can also use them to attach to surfaces and perform gliding motility. Its flagellar adhesiveness can be switched on and off by blue and red light, respectively [1]. This makes *C. reinhardtii* ideal to study surface colonization and aggregation of photoactive microorganisms; the first steps towards biofilm formation. We employ single-cell micropipette force spectroscopy [2] on model substrates and find that flagellar adhesion is of around 1-2 nN in blue light, surface-unspecific, and mediated by electrostatic interactions [3]. We also use brightfield microscopy and a Langmuir-type model to quantify the adsorption and desorption kinetics of a confined suspension of motile *C. reinhardtii* cells under controlled light conditions [4]. Finally, we discovered that populations of surface-associated cells transition from local clusters to interconnected networks with increasing surface coverage by means of their gliding motility in conjunction with flagella mechanosensing [5].

### References

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