

Supporting Material

Uncovering the mechanism of trapping and cell orientation during *Neisseria gonorrhoeae* twitching motility

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Dependence of the theoretical model on parameters

Velocity distribution

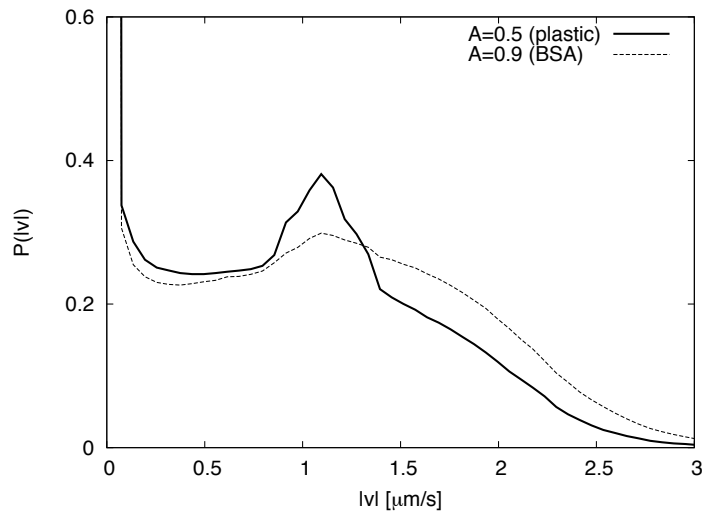


Figure S1: Speed distribution obtained in simulations. Simulated cell trajectories are sampled with the same time resolution as in the experiments. The major difference to the measured speed distribution is a narrower peak at zero speed. As explained in the main text possible reasons could be that in simulations we neglect Brownian motion, force fluctuations, force-velocity dependence, and elasticity of pili. Solid and dashed lines represent plastic and BSA coated plastic conditions respectively.

Ratio of threshold and pulling force

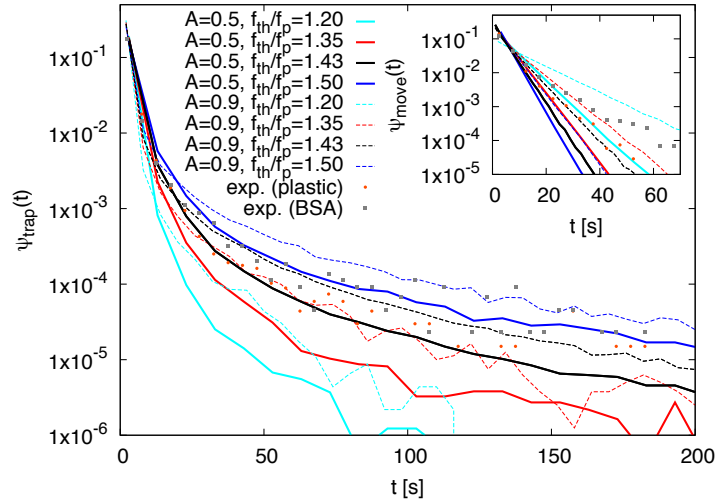


Figure S2: Dependence of trapping and moving times on the ratio of the threshold and pulling forces. This ratio is the central parameter making the traps possible for $f_{th}/f_p > 1$. It affects both short and long trapping regimes, and moving times. For f_{th}/f_p values close to 1 there are almost no traps and the cell is mostly moving (see cyan solid and dashed curves). As the ratio starts to increase, traps become longer (from red to blue lines) and moving times shorter. Different colors correspond to different values of the ratio, solid and dashed lines represent two attachment probabilities $A=0.5$ and 0.9 respectively, whereas red and gray dots reserved for the experimental data.

Pili detachment time

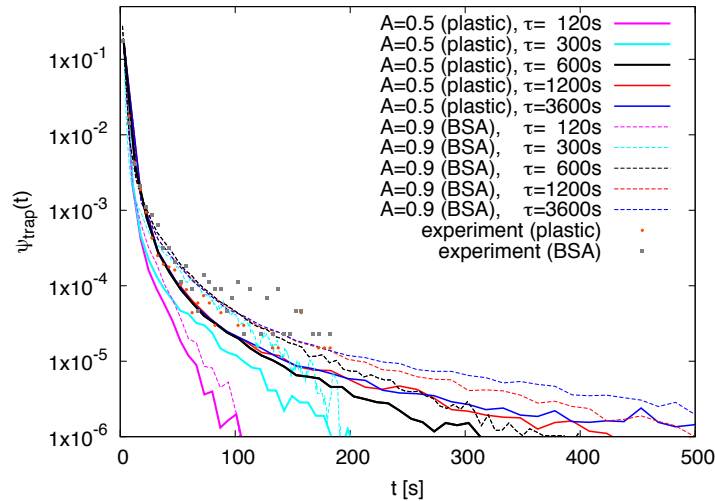


Figure S3: Dependence of trapping time distribution on average pili detachment time. We see how the tail of the trapping time distribution gradually appears as the detachment time is increased (curves from pink to blue; solid and dashed lines for two attachment probabilities $A=0.5$ and 0.9). The value $\tau_s=600$ s is what we use to match the experimental data (dots).