3D ARCHITECTURE OF A BACTERIAL DNA SEGREGATION APPARATUS : EXPERIMENTS AND MODELING

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**RESULTS:**

**FIG. 2:** (LEFT) Sketch of two possible processes for SopB binding. The blue line and the red disks represent the plasmid DNA and the diffusing SopB dimers, respectively. The SopB dimers become brown disks when bound to the centromere (the green rectangle) or blue when bound to the DNA plasmid. The model on the left involves stochastic binding: SopB binds when the DNA enters the plasmid DNA region (red circle). The model on the right involves polymerization: binding is most likely to happen next to a previously bound SopB.

(RIGHT) The figure displays SopB spreading on the F plasmid measured by ChIP-sequencing. The average number of reads (indicating bound SopB) per 100-base pair window is plotted versus nucleotide coordinate on a log-log scale. The stochastic binding model predicts a power law decay with an exponent close to 1.5 (the value obtained for ideal chain statistics governed only by entropy, without bridging). The polymerization model predicts an exponential decay (1D Ising model with fixed boundary conditions). Interestingly, the fitted power law exponent is close to the value predicted by the stochastic binding model using ideal polymer chain physics (1.5). On the other hand, the characteristic length in the fitted exponential is unjustifiably large from a physical point of view and only the first few terms in the Taylor expansion are important, leading to a lack of a strong signature for exponential behavior.