

Quantity	Dimensional Estimate	Simulation Value	Source
MreB translocation step size, L	200 nm	0.4	this work
	30 nm-1 μm	–	this work
Time per step	$L/v = 20$ s (7 s)	–	–
Cell radius, a	0.5 μm	1	–
Typical cell length	2 μm	4	–
Number of steps, N	~ 20 min	60 (170)	–
Filament speed, v	10 nm/s (30 nm/s)	–	[1, 30, 31]
	5-30 nm/s (20-85 nm/s)	–	[1, 19, 30–34]
Time per step	$L/v = 20$ s (7 s)	–	–
Activation rate, k	$\sim 20 \mu\text{m}^{-2} \cdot \text{min}^{-1}$	40 (15)	[13]
MreB filament persistence time, τ	5 min	–	[14]
Deactivation rate, λ	$1/\tau = 0.2 \text{ min}^{-1}$	0.07 (0.02)	–
Linear dependence of σ on Δc , α	(0.6 rad $\cdot \mu\text{m}^{-1}$)	0.3	–
Quadratic dependence of σ on Δc , β	(0.6 rad $\cdot \mu\text{m}^{-2}$)	0.15	–
Typical translocation noise, σ	0.3 rad	0.3	[1]
	0.1-0.5 rad	–	[1, 21, 31]

Supplementary file 3: Variables used, or calculated, in the model of filament translocation and their numerical values for *E. coli*. Values exclusive to *B. subtilis*, when relevant, are in parentheses, and dashes denote values that are not used or not relevant. The first value listed is the value assumed in this work, and subsequent values, when available, indicate estimated ranges for the same variable.