

| Quantity  | Estimate  | Source        |
|---|---|---------------|
| <b>MreB values</b>  |   |               |
| MreB filament length, $L_f$   | 220 nm  | [1]           |
|   | 100-500 nm  | [1,7,8,19–21] |
| MreB monomer length, $\ell_f$   | 51 Å  | [8,22]        |
| MreB cross-sectional radius, $r_f$  | 3.2 nm  | [8]           |
| MreB filament intrinsic radius of curvature, $R_s$                                | 300 nm  | [1]           |
|   | 200-300 nm  | [1,7,8]       |
| MreB Young's modulus, $Y$   | similar to actin; 2 GPa   | [23]          |
| MreB cross-sectional binding fraction, $b$  | 1/6   | this work     |
|   | 0   | [1]           |
| MreB filament flexural rigidity, $B$  | $\frac{\pi Y r_f^4}{4} \approx 1.65 \times 10^{-25} \text{ J} \cdot \text{m}$ | –             |
| <b>Membrane values</b>  |   |               |
| Lipid bilayer bending modulus, $k_b$  | 10 $kT$   | [24]          |
|   | 10-20 $kT$  | [24]          |
| Pressure difference across membrane in <i>E. coli</i> ( <i>B. subtilis</i> ), $p$ | 1 atm (20 atm)  | [25,26]       |
|   | 0.3-2 atm   | [25,27,28]    |
| Typical cell radius for <i>E. coli</i> and <i>B. subtilis</i> , $R_{\text{cell}}$ | 500 nm  | [1,13]        |
|   | 400-600 nm  | [1,13,21,29]  |
| <b>Binding energy values</b>  |   |               |
| Unit MreB monomer-membrane interaction energy, $\varepsilon_0$                    | 10 $kT$   | [1]           |
| Number of membrane binding sites, $N_{\text{int}}$                                | $2 \times L_f / \ell_f \approx 86$  | –             |
| Temperature, $T$  | 300 K   | –             |

Supplementary file 2: Variables used, or calculated, in the model of filament binding and their numerical values. The first value listed is the value assumed in this work, and subsequent values, when available, indicate estimated ranges for the same variable. Note that refs. [7,8,22] refer to *Thermotoga maritima* MreB and ref. [20] refers to *Caulobacter crescentus* MreB.