**S1 Table. Model Parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Symbol | Model value | *In vitro* value | Reference |
| Simulation  Duration | - | 10 seconds | ~1 to 2 minutes | (von Dassow et al., 2014) |
| Number of filaments | N | 1000 |  |  |
| Number of motors | M | 5000 |  |  |
| Persistence length | L | 1 µm | 6 nm to 10 µm | (Murrell and Gardel, 2012) |
| Rate of motor detachment | p0 | 1s-1 | Lower than p1 |  |
| Rate of motor attachment | p1 | 10s-1 | Higher than p0 |  |
| Rate of filament polymerization | p2 | 0.7s-1 | 0.7 to 1.2/s | (Amann, 2001; Pollard, 1981) |
| Time step size | h | 0.01 s |  |  |
| Search radius of motor | r | 0.3 µm | ~0.3 µm length of a single NMM II | (Shutova et al., 2012) |
| Motor velocity | v | 1 µm/s | 1 to 3 µm/s | (Kron and Spudich, 1986; Murphy et al., 2001) |
| Dynamic viscosity | η | 1 pN s/µm2 | 8.9 x 10-4  pN s/µm2 | (Hunt, 1994) |
| Motor stiffness | k | 3 pN/µm | 1.875 pN/µm (single myosin) to 1,250 pN/µm (skeletal muscle) | (Dunaway et al., 2002; Kaya and Higuchi, 2010; Nagornyak et al., 2005; Neumann et al., 1998) |
| Rate of motor diffusion | d | 0.02/s |  |  |
| Mean step size of motor diffusion | µ | 0.001 µm |  |  |
| Diameter of actin filament | di | 0.008 µm | 0.006 to 0.008 μm | (Howard, 2001) |
| Domain size (hexagon diameter) | - | 2 µm | 5 µm in 2D simulation | (Dasanayake, 2011) |
| Angle of crosslinking | - | <22.5º | 0 to 90º | (Cooper, 2000) |
| Cross-linker span | - | 40 nm | 10 to 40 nm | (Cooper, 2000; Falzone, 2012; Pollard and Cooper, 1986) |

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