

Table S1. **Simulation parameters**

Parameter description	Simulation	Experimental result	Reference ^a
Shape of embryo			
Long axis of egg [$\times 10^{-6}$ m]	50		
Short axes of egg [$\times 10^{-6}$ m]	30		
Radius of pronucleus [$\times 10^{-6}$ m]	5		
MT dynamics			
Growth velocity of MT (V_g) [$\times 10^{-6}$ m/s] ^b	0.328	0.118–0.8	Srayko et al., 2005
Shrinkage velocity of MT (V_s) [$\times 10^{-6}$ m/s] ^b	0.537	0.157–0.537	Kozlowski et al., 2007
Catastrophe frequency of MT (f_{cat}) [1/s] ^b	0.046	0.0115–0.046	
Rescue frequency of MT (f_{res}) [1/s] ^b	0.133	0.0113–0.133	
Number of MT fibers ^b	208	–300	Srayko et al., 2005
Pulling force			
1	1.1	0.78–1.1	
Maximum velocity of motor (V_{max}) [$\times 10^{-6}$ m/s]	2.0	1.1–2.0	
Density of motors on MT (D) [$\times 10^3$ /m] ^b	5	NA	
Ratio of number of motors on anterior and posterior cortexes	2:3	2:3	Grill et al., 2003
Expected number of associating motors when an MT reaches the anterior cortex [1/s] ^b	0.8	NA	
Drag force of centrosome complexes			
Viscosity of cytosol (η) [N-s/m ²]	1	0.9–1.1	Daniels et al., 2006
Stokes' radius of the centrosome-containing complexes (r) [$\times 10^{-6}$ m] ^c	10	5–15	
Model-specific parameter			
Time step [s]	0.05		

NA, not applicable.

^aOnly references that do not appear in Kimura and Onami, 2005 are shown.

^bSee Materials and methods for choice of parameters.

^cStokes' radius of the centrosome-containing complexes (pronucleus and mitotic spindle) was estimated such that its value was between the radius of the pronucleus/spindle and the short radius of the egg because MTs associated with the pronucleus increase the drag force on the pronucleus (Reinsch and Gönczy, 1998).

References

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