

<i>Parameter</i>	<i>Description</i>	<i>Min value</i>	<i>Base value</i>	<i>Max value</i>	<i>Comment</i>
$k_{a,n}^{ECM}$ (min^{-1})	Rate constant, N assembly	0.01		10	Varied; input to the model
E_n	Rac $\rightarrow$ protrusion coupling		100		Arbitrarily $\gg 1$ (strong effect)
K_v	Saturation of protrusion velocity		1		Max protrusion requires $r \gg 1$
I_n	$S \rightarrow$ protrusion inhibition	0		10	Varied over a broad range
$k_{d,n}$ (min^{-1})	Rate constant, basal N turnover		0.1		Arbitrary; same value as $k_{d,s}$
C_n	Protrusion $\rightarrow N$ turnover coupling		20		Max turnover $C_n k_{d,n} \approx 2 \text{ min}^{-1}$; ref. [1]
$k_{a,s}$ (min^{-1})	Rate constant, basal S growth		0.01		Arbitrarily $\ll k_{d,s}$
E_s	Myosin $\rightarrow S$ growth coupling	0		100	Varied over a broad range
$k_{d,s}$ (min^{-1})	Rate constant, S disassembly		0.1		Time scale $\sim 10 \text{ min.}$; ref. [1]
C_s	Protrusion $\rightarrow S$ convection	1	10	100	Same order of magnitude as C_n
$k_{d,m}$ (min^{-1})	Rate constant, M deactivation		4		Arbitrarily fast (same as $k_{d,r}$)
$k_{d,x}$ (min^{-1})	Rate constant, X dephosphorylation		10		Arbitrarily fast
K_x	Saturation of phospho-paxillin		1		Not saturated when $p \sim 1$
p_0	Basal paxillin phosphorylation		0.01		Arbitrarily $\ll 1$
$k_{d,r}$ (min^{-1})	Rate constant, Rac deactivation		4		Fixed from ref. [2]
$k_{d,p}$ (min^{-1})	Rate constant, PAK deactivation		10		Arbitrarily fast
K_p	Saturation of PAK activation		1		Not saturated when $r \sim 1$
N^*	Scaling factor, N	1	3	10	Stochastic models; varied
K_m	Amplification factor, $S \rightarrow$ Myosin		10		Stochastic models; see main text
K_r	Amplification factor, Paxillin $\rightarrow$ Rac		10		Stochastic models; see main text
D_r ($\mu\text{m}^2/\text{min}$)	Mobility coefficient, Rac		15		Next subvolume model; fixed from ref. [2]

Table S1. Model parameters.

References:

1. Nayal A, Webb DJ, Brown CM, Schaefer EM, Vicente-Manzanares M, et al. (2006) Paxillin phosphorylation at Ser273 localizes a GIT1-PIX-PAK complex and regulates adhesion and protrusion dynamics. J Cell Biol 173: 587-599.
2. Moissoglu K, Slepchenko BM, Meller N, Horwitz AF, Schwartz MA (2006) In vivo dynamics of Rac-membrane interactions. Mol Biol Cell 17: 2770-2779.