

Supplemental Materials

Molecular Biology of the Cell

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Supplemental Materials

Figure S1. Cells at the blastopore engage in dynamic motility during blastopore closure. Cells at the blastopores of mid-gastrulae and late gastrulae were fluorescently labeled by brief incubation in a dilute solution of artificial seawater containing DiI(C₁₆). A. Three time points of surface views from a multiphoton movie of DiI labeled cells at the blastopore view of a normal late gastrula embryo (time shown in minutes relative to the first frame). Scale bar = 10 μ m. Cell 1 repeatedly extends and retracts filopodia, which contact cell 2 (arrow, 24 min). As the blastopore narrows, cell 2 moves closer to cell 1, ultimately establishing contact with a more substantial extension from cell 1 (32 min, arrow). In this same time series, cell 3 interacts extensively with cell 4. Cell 3 has constant contact with cell 4 throughout this recording, extending and retracting multiple fine filopodia (arrow, 24 min). As the blastopore closes, cell 3 becomes increasingly elongated and slides alongside cell 4, so that at the end of the recording the two cell bodies are closer to one another. B. Magnified view of cell 1; cell 2 is to the right. Cell 1 extends a protrusion towards cell 2, making what appears to be a new contact site with cell 2 (32 min). Scale bar = 5 μ m.

Table S1. Measurements of cell shape and motility of cells at the blastopore during gastrulation in *L. pictus*.

Video 1. Time lapse movie of archenteron elongation in *L. pictus*. Time elapsed in minutes from the start of the movie is shown.

Video 2. Effects of externally applied tension on a two-dimensional vertex model of a rearranging epithelium corresponding to Figure 2A. See the text for further description of modeling procedures.

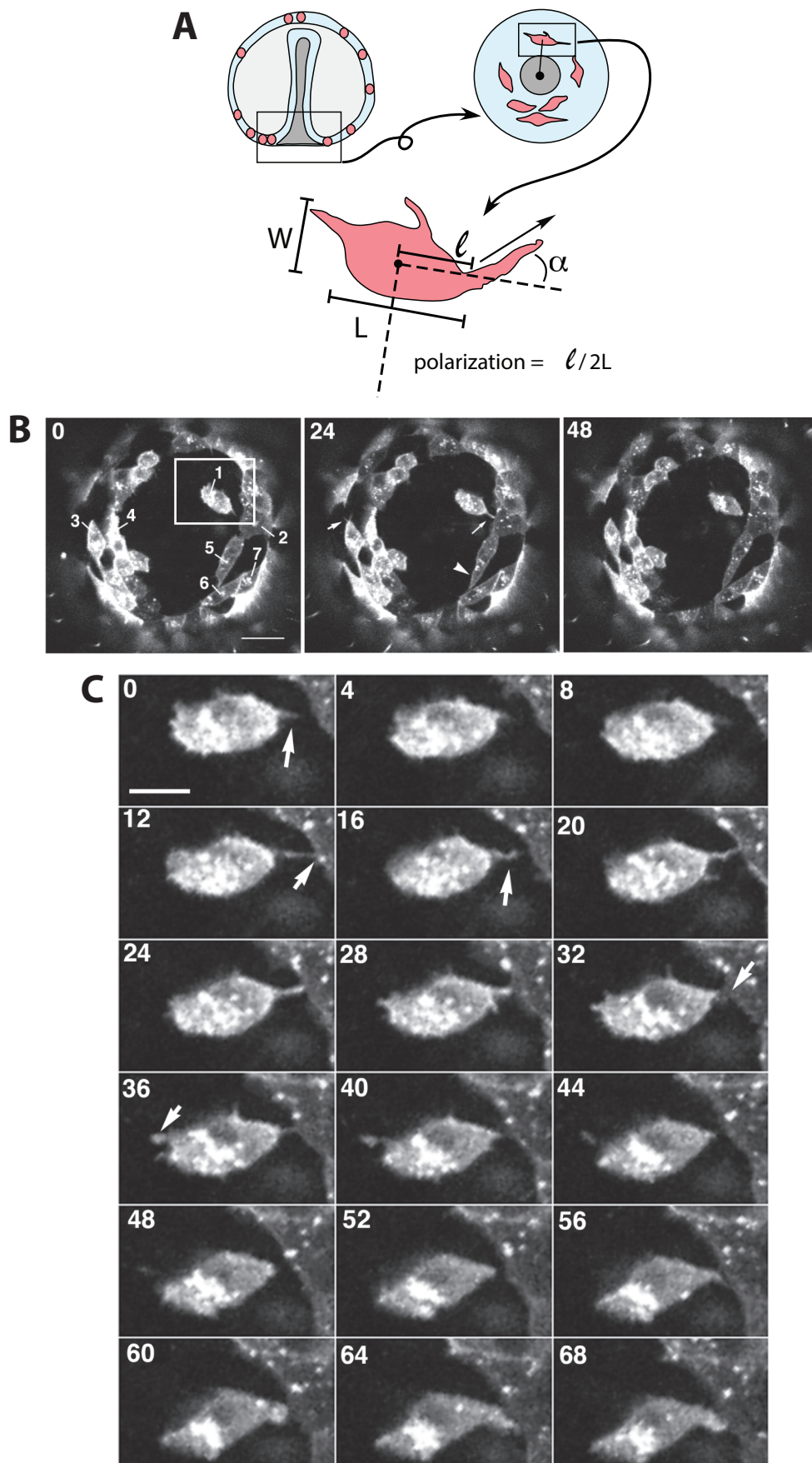


Figure S1

Supplemental Table 1**A. Comparison of cell behavior at the blastopore in normal mid- vs. late gastrulae**

	Cell Shape	Filopodial Characteristics		
	Feret ratio* (mean \pm SEM)	Length (μ m)* (mean \pm SEM)	Polarity* (mean \pm SEM)	Angle ($^{\circ}$)** (mean \pm SEM)
Mid-gastrulae	1.40 \pm 0.07 n=39	1.88 \pm 0.08 n=224	0.58 \pm 0.02 n=224	45.0 (0.02<p<0.03) n=224
Late gastrulae	1.75 \pm 0.14 n=25	1.86 \pm 0.08 n=147	0.66 \pm 0.02 n=147	41.0 (0.02<p<0.03) n=147
p-value	0.05	0.59	0.002	

* Mann-Whitney U test at 95% confidence interval

** Rayleigh's Test of Uniformity at 95% confidence interval shown in parentheses

B. Comparison of cell behavior in normal vs. mAb183-treated mid-gastrulae

	Cell Shape	Filopodia Characteristics		
	Feret ratio* (mean \pm SEM)	Length (μ m)* (mean \pm SEM)	Polarity* (mean \pm SEM)	Angle ($^{\circ}$)** (mean \pm SEM)
Normal midgastrulae	1.40 \pm 0.07 n=39	1.88 \pm 0.08 n=224	0.58 \pm 0.02 n=224	45.0 0.02<p<0.03 n=224
mAb183 midgastrulae	1.96 \pm 0.1 n=46	2.83 \pm 0.13 n=199	0.57 \pm 0.02 n=199	43.3 p>0.5 n=199
p-value	0.0001	0.001	0.65	

* Mann-Whitney U test at 95% confidence interval

** Rayleigh's Test of Uniformity at 95% confidence interval shown in parentheses

C. Comparison of cell behavior in normal vs. mAb183-treated late gastrulae

	Cell Shape	Filopodial Characteristics		
	L/W (mean \pm SEM)	Length (mm)* (mean \pm SEM)	Polarity* (mean \pm SEM)	Angle ($^{\circ}$)**
Normal late gastrulae	1.75 \pm 0.14 n=25	1.86 \pm 0.08 n=147	0.66 \pm 0.02 n=147	41.0 (0.02<p<0.03) n=147
mAb183 late gastrulae	1.80 \pm 0.11 n=14	2.05 \pm 0.13 n=69	0.59 \pm 0.02 n=69	45.5 (0.03<p<0.04) n=69
p-value	0.46	0.25	0.06	

* Mann-Whitney U test at 95% confidence interval

** Rayleigh's Test of Uniformity at 95% confidence interval shown in parentheses