Supporting Information

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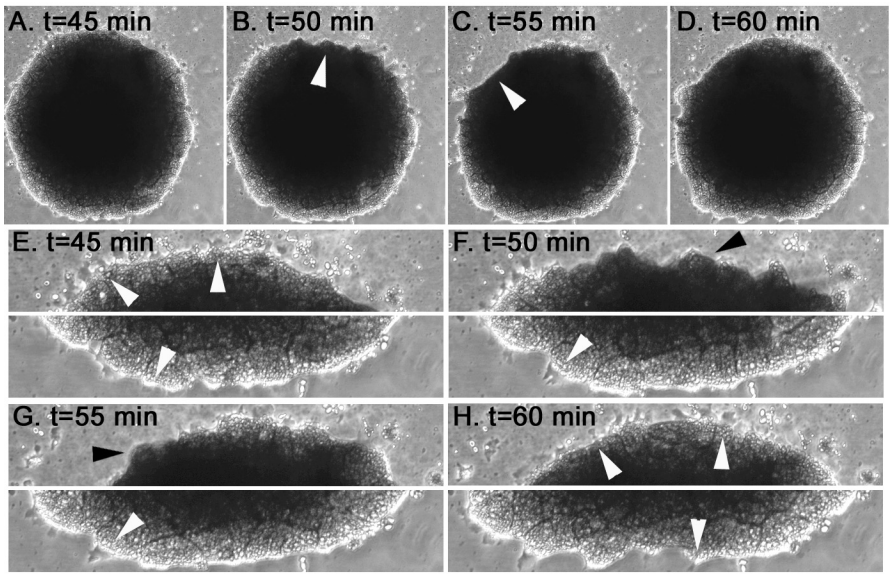

Fig. S1. Migration of head mesoderm explants. Time-lapse movies were captured of anterior mesendoderm explants for 1 h following plating on their native extracellular matrix in the directed migration assay. A typical explant is shown from time (*t*) 45–60 min. (*A*–*D*) Low magnification images reveal that the explant initially extended cytoplasmic protrusions around its entire circumference. Collapse of the protrusions at the trailing edge (white arrowheads in *B* and *C*) was accompanied by the forward movement of the explant. Immediately following this collapse, cytoplasmic protrusions were again extended around the entire circumference of the explant. (*E*–*H*) Higher magnification images of the same explant. Examples of cytoplasmic protrusions such as lamellipodia are indicated by white arrowheads. Note the lack of such protrusions at the trailing edge following its collapse (black arrowheads). Initial observations indicate that a similar number of lamellipodia are initially extended at both the leading and trailing edges.

Fig. S2. Injection of heparinase III into the blastocoel cavity causes axial and anterior defects as reported in ref. 1. (*A*) Uninjected embryos. (*B*) Embryos injected with 25 nL buffer in which heparinase III was diluted. (*C*) Embryos injected with 25 nL heparinase III (1.8×10^{-5} units).

1. Brickman MC, Gerhart JC (1994) Heparitinase inhibition of mesoderm induction and gastrulation in *Xenopus laevis* embryos. *Dev Biol* 164:484–501.

Table S1. Tabulated data of mesendoderm migration assays

	Total, n	Animal Pole, %	Blastopore Lip, %	Lateral, %	Stalled, %
Untreated control	67	72	7	15	6
Heparinase treatment	39	44	26	20	10
Hep post deposition	15	60	13	20	7