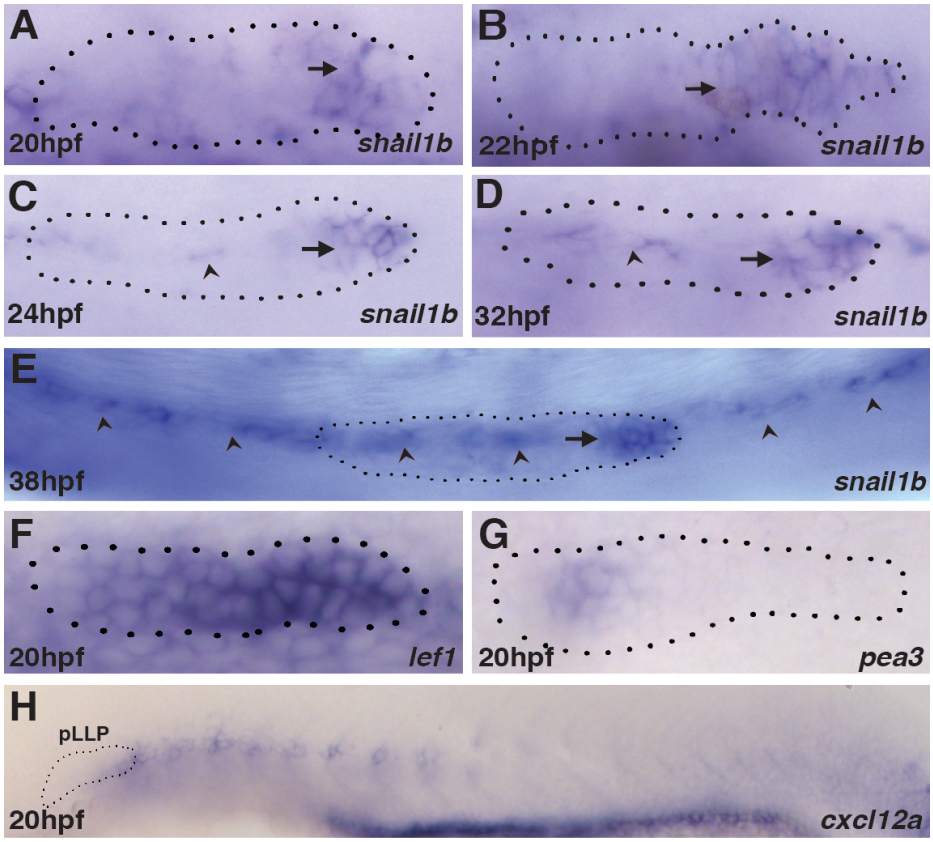


Fig.S1: *snail1b* expression in the leading domain (arrow) at (A) 20hpf, (B) 22hpf, (C) 24hpf (D) 32hpf and (E) 38hpf. arrow heads in C-E show *snail1b* expression in the underlying cells of the horizontal myospetum. (F) At 20hpf, Wnt-dependent *lef1* expression is broad and, (G) FGF-dependent *pea3* has not been effectively established. (H) However, at 20hpf the primordium is only exposed to *cxcl12a* at its caudal end.

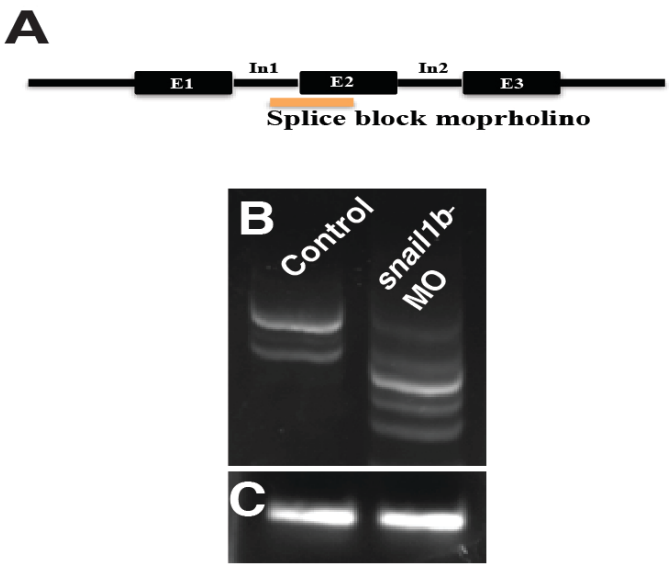


Fig.S2: Splice block *snail1b*-MO. (A) cartoon showing the SB target site of *snail1b*-MO. (B) RT-PCR products of control and *snail1b*-MO. (C) L-24 internal control.

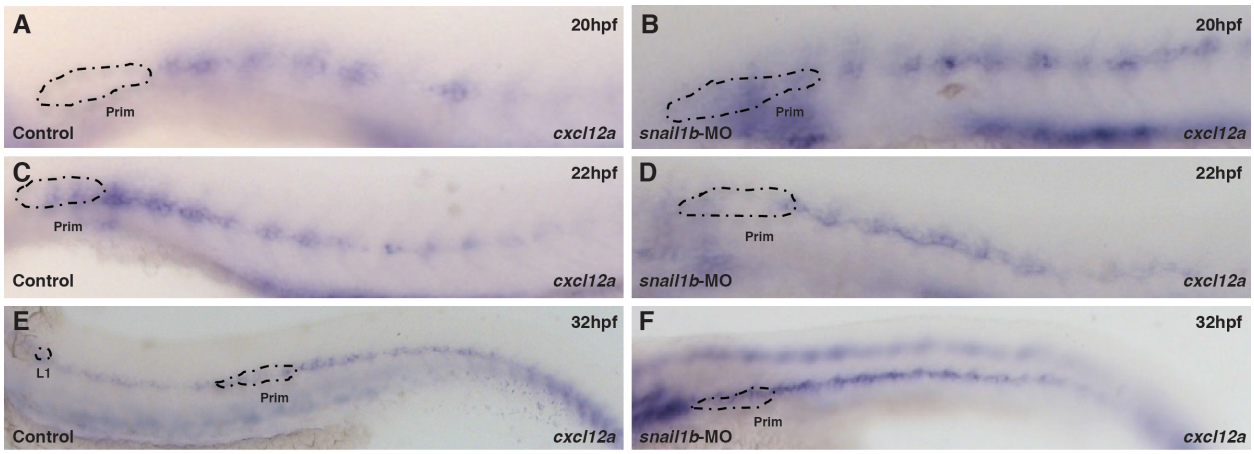


Fig.S3: The delay in initiation of primordium migration in *snail1b* morphants is not due to aberrant *cxcl12a* expression by underlying *snail1b*-expressing horizontal myoseptum cells. *cxcl12a* begins to express on the horizontal myospetum at 20hpf (A) and it forms a stipe over the entire embryo by 22hpf (C) and continues to express at 32hpf (E) in controls. *snail1b* morphants have similar spatiotemporal pattern of *cxcl12a* expression (B,D,F).

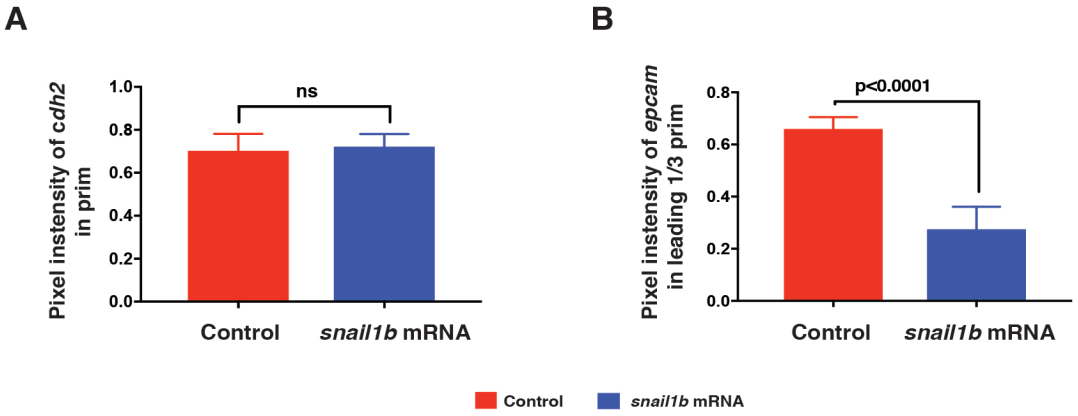


Fig.S4. Quantification of *cdh2* (A) and *epcam* (B) expression in control and *snail1b* mRNA injected embryos. Prim is primordium, error bars represent standard error of the mean

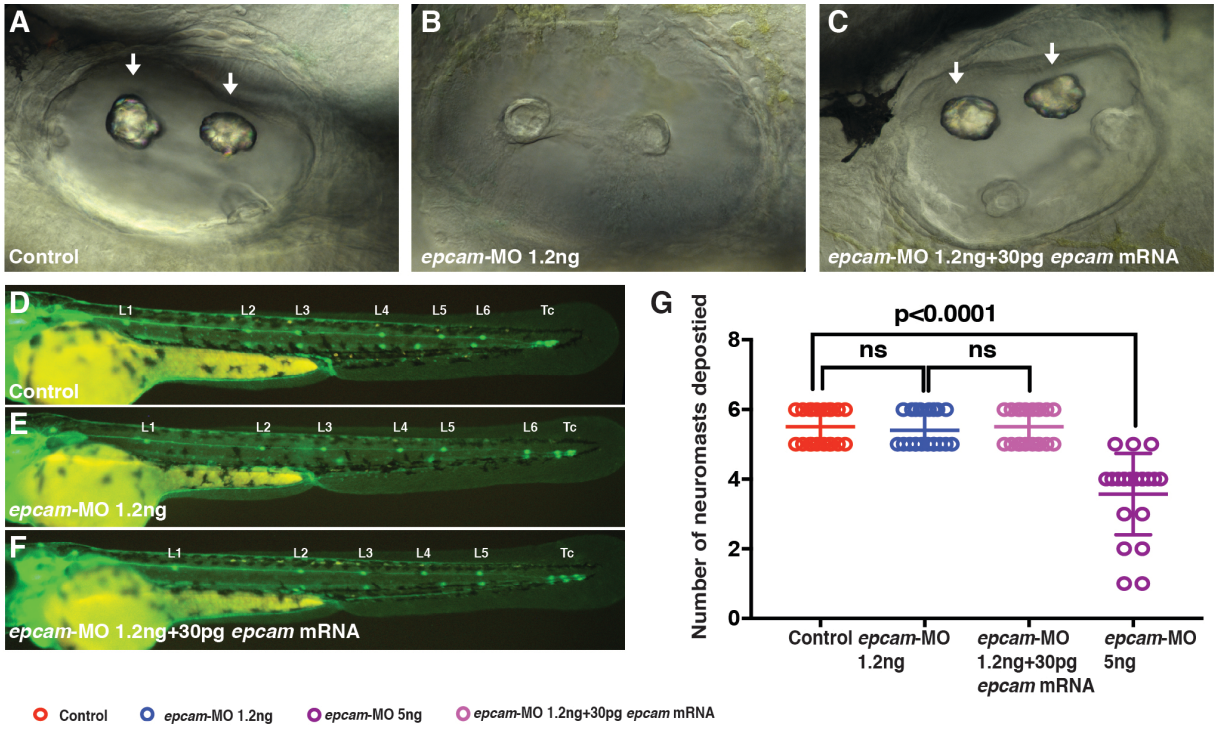


Fig.S5. Validation of *epcam*-MO. (A-C) Injection of 1.2ng *epcam* morpholino recapitulated a previously published *epcam* mutant phenotype. It prevented normal morphogenesis of otoliths (shiny crystals lost- arrows). Co-injection of 30ng rescued this morphant phenotype. (D-G) As in the *epcam* mutants, there was no obvious lateral line phenotype with injection of 1.2ng *epcam*

morpholino. (G) However, when the dose of *epcam* morpholino was increased to 5 ng, a more variable number of neuromasts was deposited, consistent with previous studies that had suggested that the *epcam* morpholinos can have some off-target effects. For our study only the low dose of 1.2 ng was used to minimize potential off target effects.

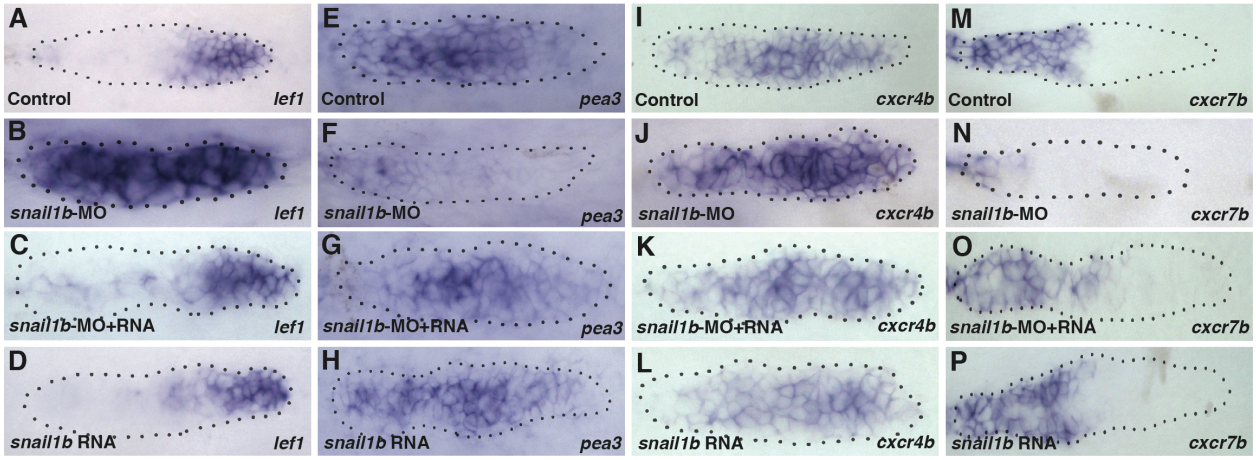
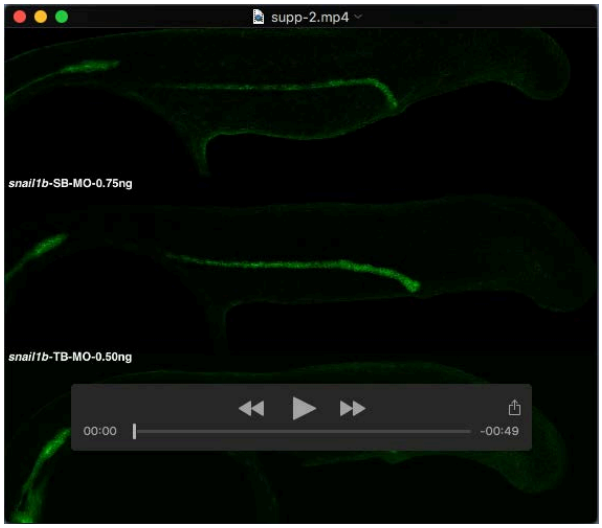
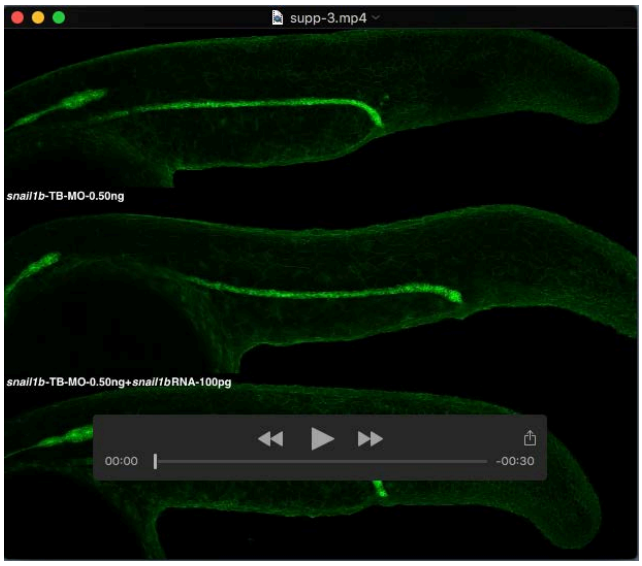


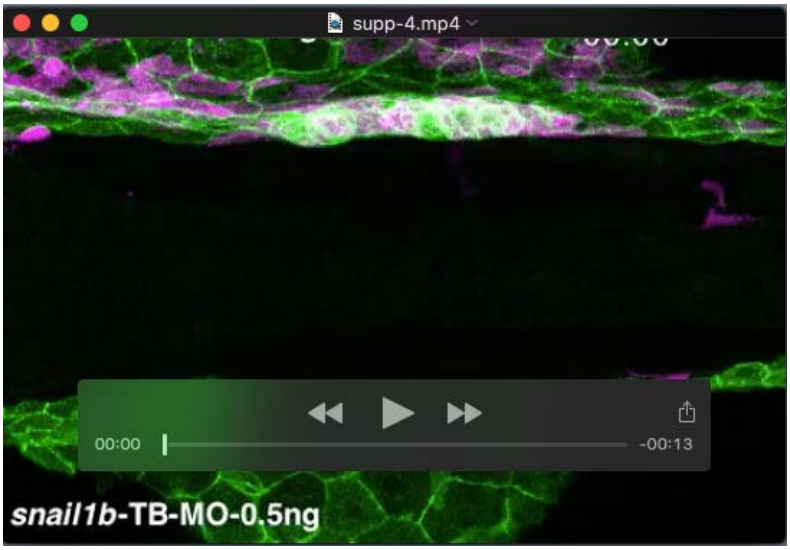
Fig.S6: Rescue of the delayed dynamics of Wnt Fgf signaling systems in snail1b morphants by co-injection of *snail1b* mRNA. Expression of *lef1* (A), *pea3* (E), *cxcr4b* (I) and *cxcr7b* (M). *lef1* (B) and *cxcr4b* (J) are expanded into the trailing domain (B), *pea3* (F) and *cxcr7b* (N) are not well established in the trailing domain of *snail1b*-MO. Injection of *snail1b* mRNA along with *snail1b*-TB MO restores the expression patterns of *lef1* (C), *pea3* (G), and *cxcr7b* (O). However, restricted *cxcr4b* expression is not restored (K). Injected of *snail1b* mRNA alone does not have any obvious effect on these signaling systems (D, H, L, P).



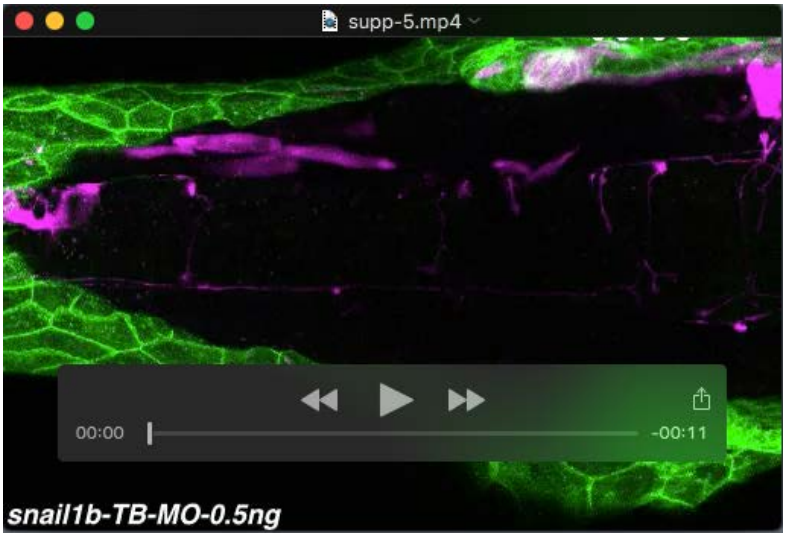
Movie S1. Time-lapse video of pLL primordium migration in control, *snail1b*-TB or SB morphant CldnB:lyn GFP transgenic embryos over approximately 28 hours.



Movie S2. Time-lapse video of pLL primordium migration in control, *snail1b*-TB injected and *snail1b*-TB morpholino and *snail1b* mRNA co-injected CldnB:lyn GFP transgenic embryos. Co-injection of *snail11b* mRNA prevents migratory problems of the primordium in *snail1b*-TB morpholinos injected embryos.



Movie S3. Time-lapse video of a *snail1b*-TB morphant in which non-morphant donor cells (purple) were effectively transplanted into the primordium on the right of the embryo. Migratory behavior is restored in the primordium on the left side which received transplanted non-morphant cells.



Movie S4. Time-lapse video of a *snail1b*-TB morphant shows that migration of the primordium that received transplanted non-morphant cells was not faster when transplanted cells were delivered to the trailing domain of the morphant primordium and not the leading end, where snail1b is normally expressed.