

**Table S1 Phenotype quantification**

Experiments	Phenotypes	Embryos analysed	Embryos with phenotype	Phenotype %
<b><i>LIX1</i> loss-of-function</b>				
E4.5 <i>LIX1</i> ISH	Down-regulation	36	22	61
E6.5 <i>SM22</i> ISH	Smaller domain	23	14	60.87
E7 PH3 IS	Less PH3-positive cells	12	11	91.67
<b><i>LIX1</i> gain-of-function</b>				
E4.5 <i>SM22</i> ISH	Early expression	16	11	68.75
E6.5 <i>SM22</i> ISH	Expanded domain	30	17	57
E6.5 <i>BAPX1</i> ISH	Expanded domain	13	9	69
E6.5 <i>SOX10</i> ISH	Ectopic staining	20	12	60
E6 PH3 IS	More PH3-positive cells	15	15	100
E7 PH3 IS	Less PH3-positive cells	16	16	100

ISH, in situ hybridization ; IS, immunostaining.