Supplemental Figure Legends

Fig. S1. Approximate 30% homozygous *Lmo4*$^{lacZ/lacZ}$ mutants exhibit exencephaly and neural tube closure defect. Wild type or *Lmo4*$^{lacZ/+}$ heterozygous embryos are at the left and *Lmo4*$^{lacZ/lacZ}$ homozygous embryos at the right. (A) Dorsal view of whole-mount X-Gal stained *Lmo4*$^{lacZ/+}$ and *Lmo4*$^{lacZ/lacZ}$ embryos at E9.5. (B, C) Lateral view of *Lmo4*$^{lacZ/+}$ and *Lmo4*$^{lacZ/lacZ}$ embryos at E11.5 (B) and E18.5 (C). Arrows point to the neural tube closure defect or exencephaly. Scale bars equal 0.5 mm in (A) and 1 mm in (B, C).

Fig. S2. Expression pattern of *Lmo4* in the developing mouse otic vesicle. (**A-F)** Expression comparison of *Lmo4* (**A, C, E**) and *Hmx3* (**B, D, F**) by section (**A, B**, **E, F**) and wholemount (**C, D**) in situ hybridization in the developing mouse inner ear at E9.5 (**A, B**) and E10.5 (**C-F**). *Lmo4* is expressed in the lateral portion of the otic vesicle at E9.5 and its expression shifts dorsally at E10.5. (**G-P**) Section X-Gal stained *Lmo4*$^{lacZ/+}$ embryos at E9.5 (**G-K**) and E10.5 (**L-P**) show that *Lmo4* is expressed in the lateral part of the otic vesicle. Abbreviations: A, anterior; D, dorsal; L, lateral; M, medial; BA, branchial arches; OV, otic vesicle. Scale bar equals 50μm.

Fig. S3. Expression profile of genes by section in situ hybridization of the control and *Lmo4*-null otocyst at E9.5. *Dlx5* (A; arrows), and *Gata3* (B; arrows), and *Bmp4* (C; brackets) expression in the dorsolateral region of the early otocyst at E9.5 began to be down-regulated. Scale bar for all is 50 μm.

Figure S1

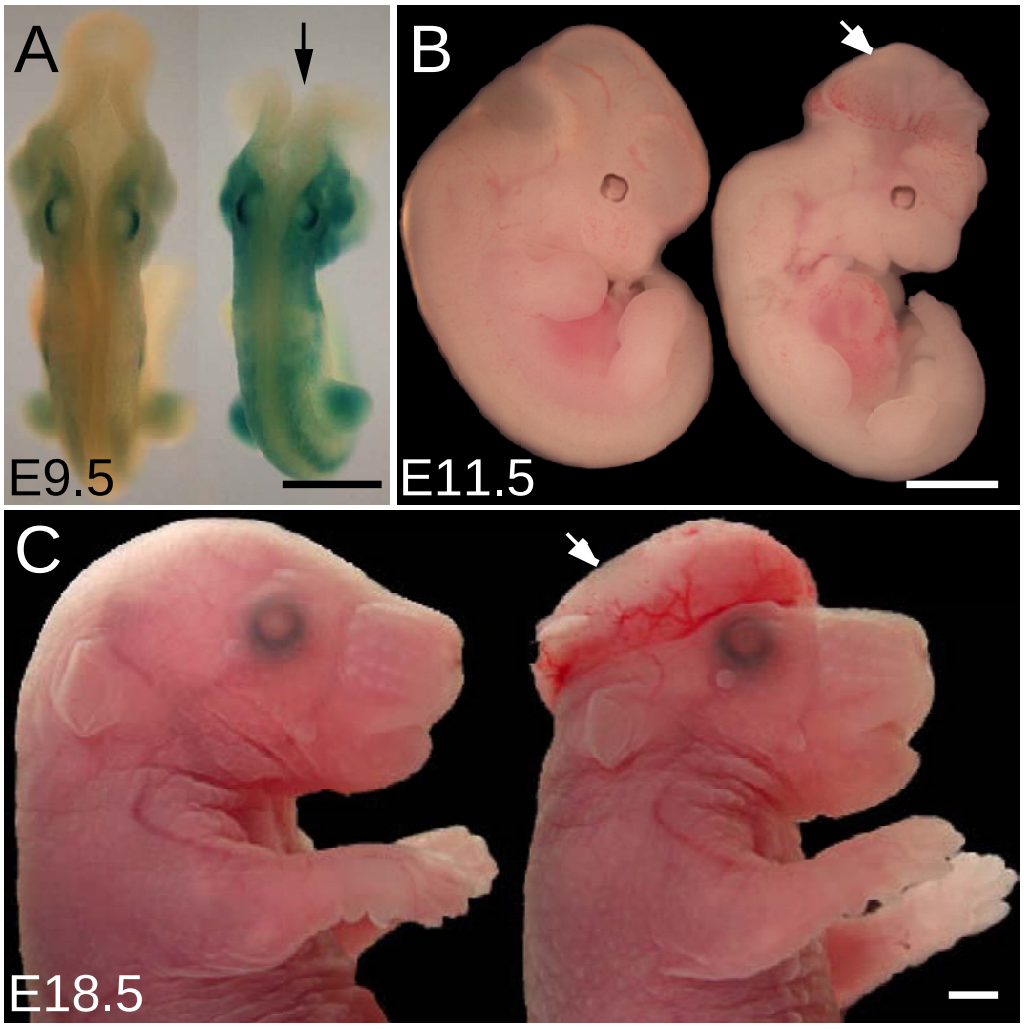
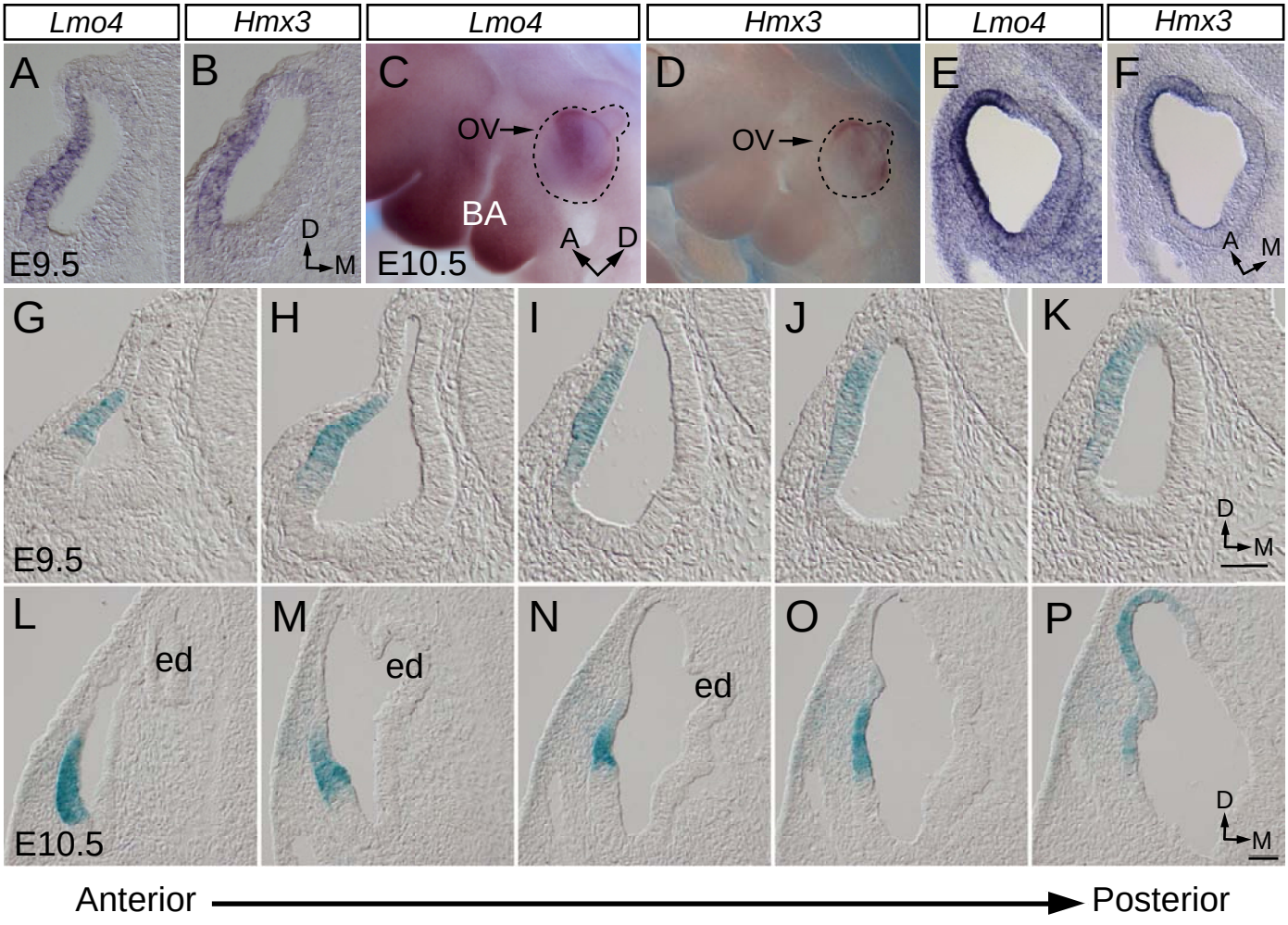


Figure S2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Anterior
Posterior

Figure S3