

### **Description of additional supplementary files**

**Supplementary Data 1.** Enriched gene list by cluster for whole calvaria dataset (related to Fig. 1B).

**Supplementary Data 2.** Enriched gene list by cluster for connective and skeletogenic subset (related to Fig. 1C).

**Supplementary Data 3.** Enriched gene list by cluster for osteoblast and prrx1a+ mesenchyme subset (related to Fig. 1E).

**Supplementary Data 4.** CellChat Signaling pairs for the prrx1a+ mesenchyme subset.

**Supplementary Data 5.** Genotyping primers for mutant alleles.