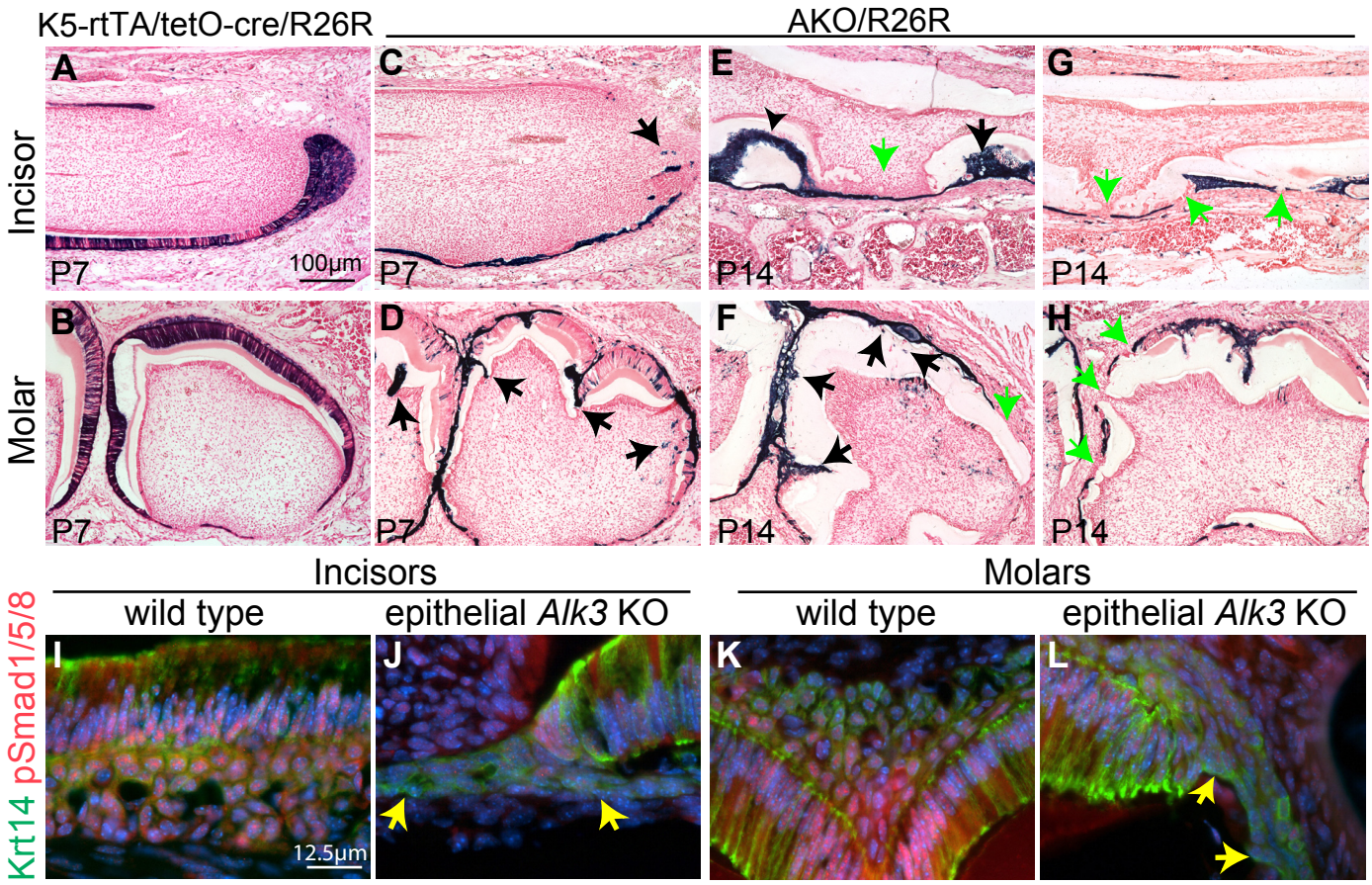

Figure S1. Lineage tracing of AKO epithelia and efficiency of blocking Bmp signaling in AKO cell. (A, B): X-gal staining of frozen sections of postnatal day (P) 7 teeth of Krt5-rtTA/ tetO-Cre/Rosa26R mice induced with doxycycline (Dox) starting on embryonic day (E) 14.5. (C-H) X-gal staining of frozen sections of P7 (C, D) and P14 (E-H) Krt5-rtTA/tetO-Cre/ Alk3fl/fl/Rosa26R (AKO/R26R) mice induced with Dox from E14.5. (I-L) Double IF staining of P7 wild typ and AKO teeth for Krt14 and phospho-Smad1/5/8.

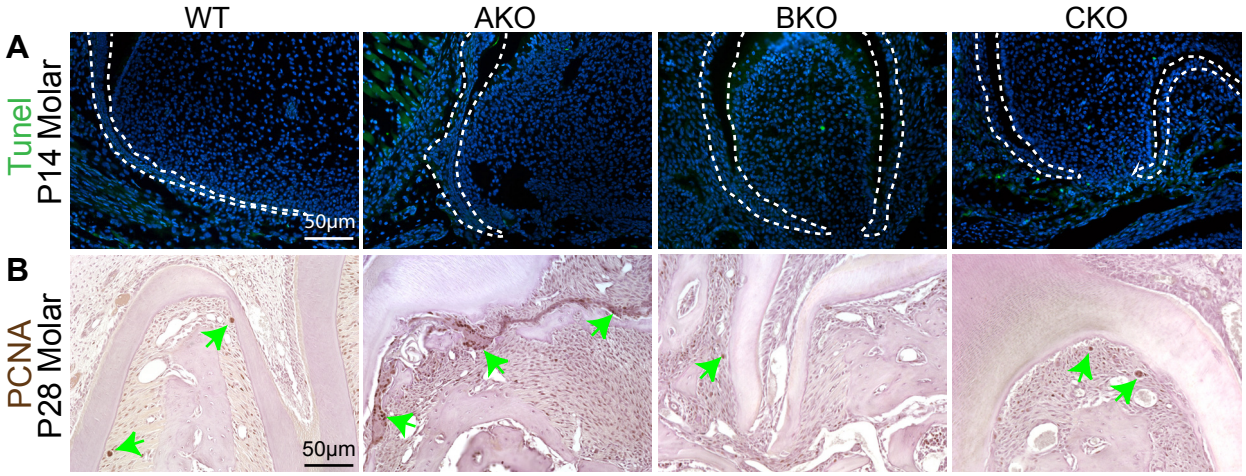

Figure S2. Effects of blocking BMP and/or Wnt signals on proliferation and apoptosis of root epithelia. (A) Tunel assay, white dashed lines indicated the root epithelial regions. (B) IHC of proliferative cell nuclear antigen (PCNA).

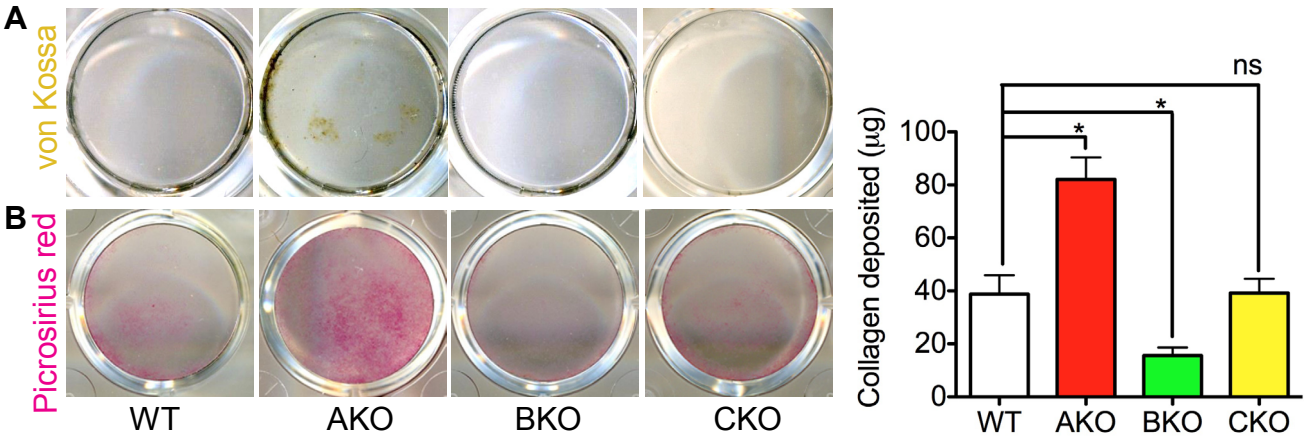

Figure S3. Mineralization and collagen synthesis of DEpSCs in vitro. DEpSCs were cultured in mineralization medium for 14 days, and then examined with von Kossa staining (A) or Picrosirius red dye staining and following quantitative collagen assay normalized to relative cell numbers determined by parallel MTT assay (B). n=3, *: P<0.05, ns: not significant. Calcium incorporation was deteced in AKO DEpSCs (1.17±0.36mM), but not in all other 3 groups (<0.02 mM of the detection threshold).

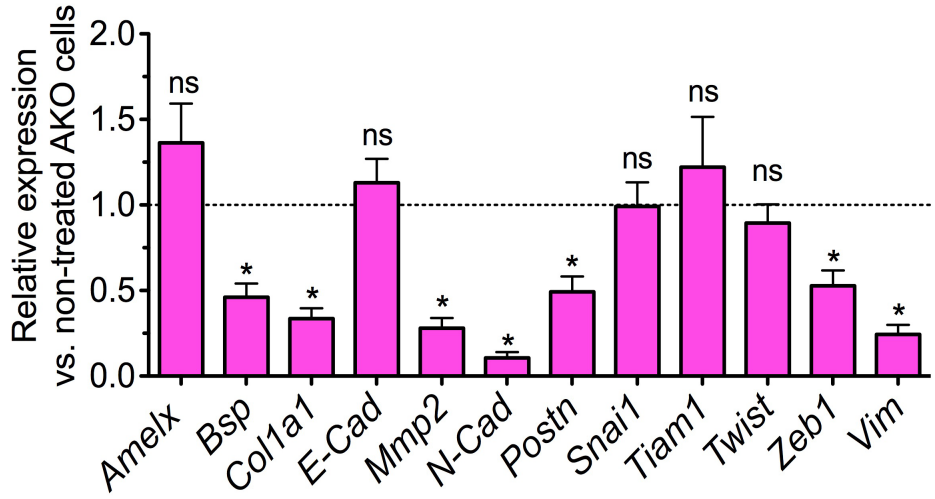

Figure S4. Basal TGF-β signaling activity is required for the EMT and differentiation swithch of AKO cells. AKO DEpSCs treated with TGF-β inhibitor SB431542 for 7 days were analyzed with qRT-PCR assay in comparision with non-treated AKO DEpSCs (n=3, *: $P<0.05$, ns: not significant).

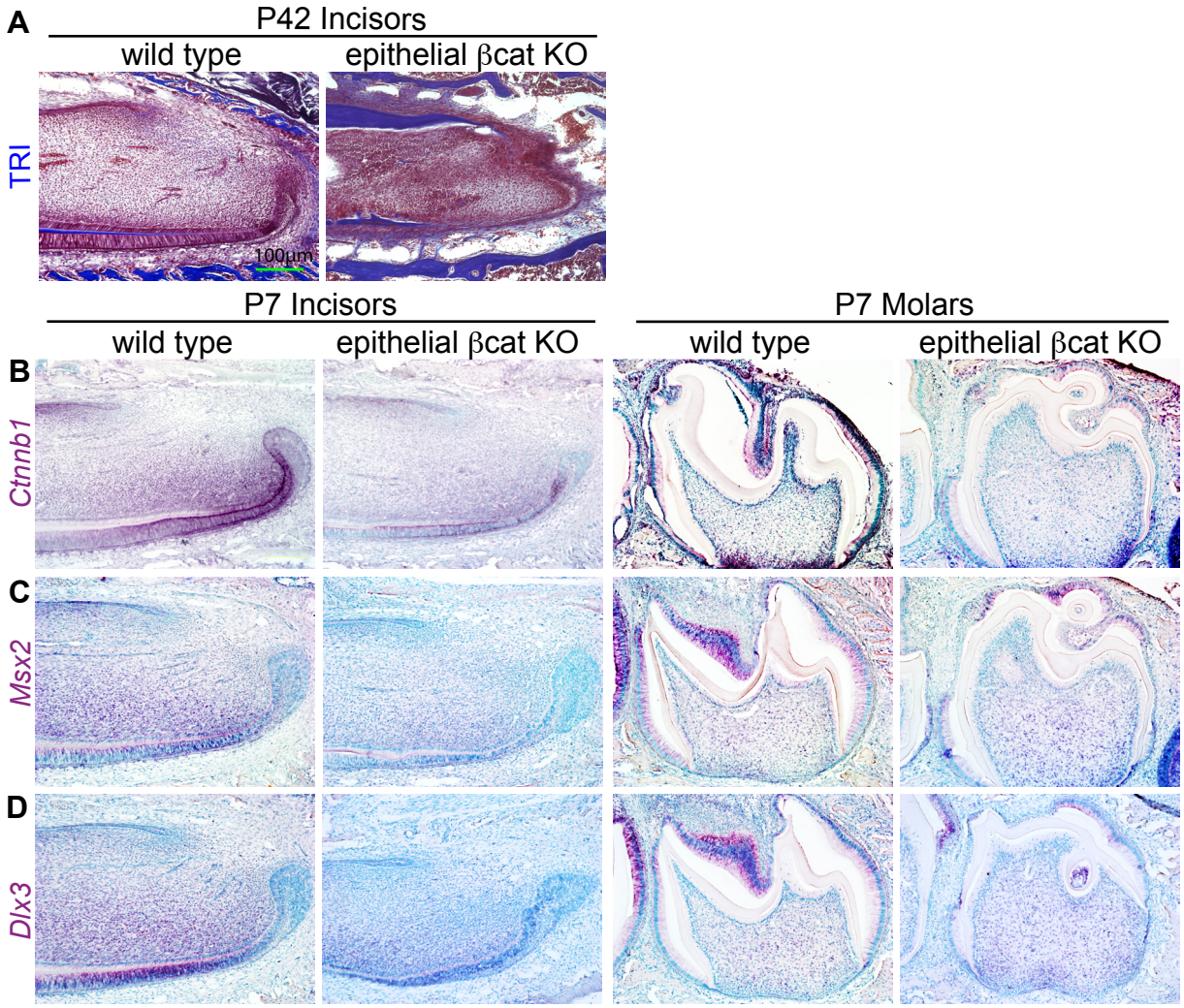

Figure S5. Epithelial depletion of β-catenin from E14.5 impaired amelogenesis upstream of Msx2 and Dlx3. (A) WT and BKO teeth were examined by TRI staining. (B-D) Expression of Ctnnb1, Msx2 and Dlx3 in P7 BKO teeth was examined with ISH.