

Supplementary Figure Legends and Supplementary Figures S1 to S7. Rakian et al, 2013.

IJOS

Supplementary Figure S1. Lineage studies by mapping Cre activity with the Sp7-Cre-EGFP mouse model, using the Rosa26-*Isl*-tdTomato line, in the mandibular and maxillary molars of Postnatal day 0 (P0) mice by confocal microscopy using the Olympus FV-1000. Combined DAPI stained nuclei (Blue), Sp7-Cre-EGFP+ (Green), and td Tomato+ (Red) (Cre event) cells are shown. S1A-C, 1st maxillary molar at 100X, 200X and 400X, respectively. S1E-G, 1st mandibular molar at 100X, 200X and 400X, respectively. S1D and S1H are from 2nd maxillary and mandibular molars at 200X, respectively. Yellow box in S1A and S1E, area shown in S1B and S1F respectively at high magnification. Red box in S1B and S1F, area shown in S1C and S1G at high magnification.

Supplementary Figure S2. Lineage studies by mapping Cre activity in the 2nd molar crown of a 2-week old mouse by confocal microscopy using the Olympus FV 1000. S2A, dapi and dic image. S2B, EGFP image. S2C, td Tomato image. S2D, combined DAPI stained nuclei (Blue), Sp7-Cre-EGFP+ (Green), and td Tomato+ (Red) (Cre event) cells are shown. Am, ameloblasts, Od, odontoblasts, DP, dental-pulp chamber.

Supplementary Figure S3. Lineage studies by mapping Cre activity in the 3st molar of a 2-week old mouse by confocal microscopy using the Olympus FV 1000. S3A, combined DAPI and DIC. S3B, Sp7-Cre-EGFP. S3C, Rosa26-tdTomato. S3D, combined DAPI stained nuclei (Blue), Sp7-Cre-EGFP+ (Green), and td Tomato+ (Red) (Cre event) cells are shown. Am, ameloblasts, Od, odontoblasts, DP, dental-pulp chamber.

Supplementary Figure S4. μ CT analysis of mandibles from 6 week old animals, Control WT and Bmp2-cKO^{Sp7CreEGFP} mice. Figures 4A and 4B are images of overall mandible and sample

section through the middle showing examples with this 1.5 month data of various components that were quantified at all ages in both 1st and 2nd molars. 1st molar, Enamel, pink; Crown Dentin, yellow; Crown Pulp, green; Root Dentin, purple; Root Pulp, rust; Periodontal volume, blue; 2nd molar, Enamel, light blue; Crown Dentin, yellow; Crown Pulp, purple; Root Dentin, light green; Root Pulp, red; Periodontium volume, dark blue.

Supplementary Figure S5. S5A and B, Ki67 immunofluorescence, 5SC and D, cleaved caspase 3 immunofluorescence, 5SE and F, TUNEL Assay of 2-week old mandibles. We note no major change in the proliferation index between WT and Bmp2-cKO^{Sp7-Cre-EGFP} mice as assayed with Ki67 antibody. There appears to be decreased apoptosis, as assayed with cleaved caspase 3 antibody and TUNEL assay in the 2nd molars of the Bmp2-cKO^{Sp7-Cre-EGFP}.

Supplementary Figure S6. Numerical estimation of the changes in gene expression evaluated by *in situ* hybridization of Dmp1, Dspp, Col1a1, Sp7 and Nfic in 1st molars of 2-week old mice. As shown, there is a great reduction in mRNA expression by 80-90% in the Bmp2-cKO^{Sp7-Cre-EGFP} animals.

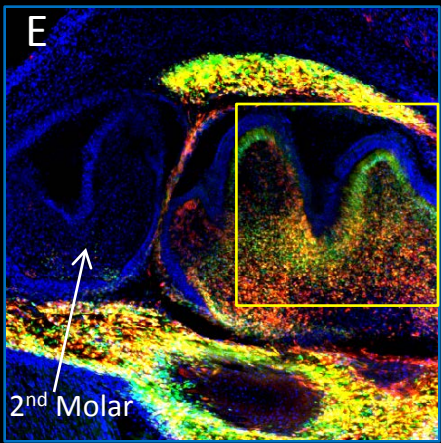
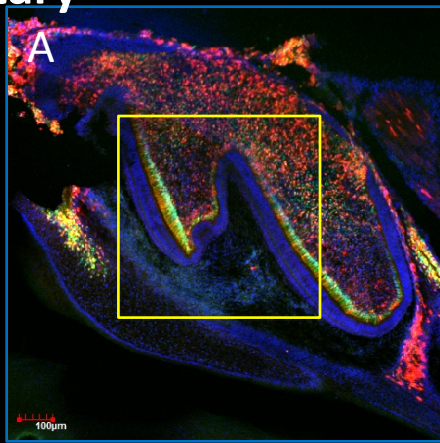
Supplementary Figure S7. Double immunofluorescence with CD31-endothelial (green) and α -SMA+ (red) in 2-week old mice. As shown, in the odontoblast layer, periodontium and apical papilla region of the Control (S7A, S7C and S7E), there are a large number of red α -SMA+ cells localizing around the CD31 immunostain—green/yellow, while the levels of these vascular associated α -SMA+ cells in these three compartments are greatly reduced in the Bmp2-cKO^{Sp7-Cre-EGFP} mice (S7B, S7D and S7F). S7A-B, 2nd and 3rd mandibular molars at 100X, S7C-D, 2nd mandibular molar root at 400X, S7E-F, 3rd mandibular molar at 200X.

Supplementary Maxillary Molars

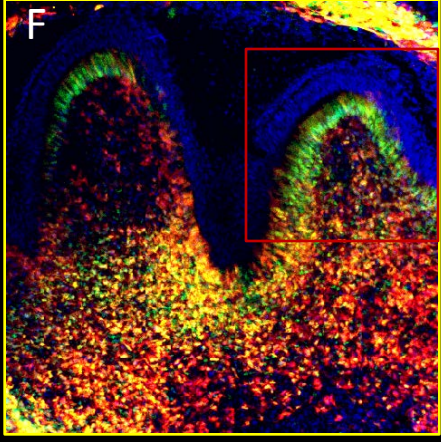
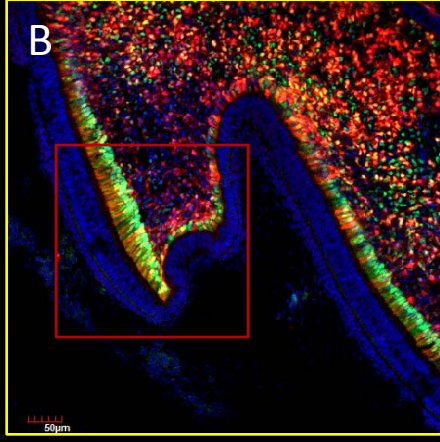
Mandibular Molars

Figure S1

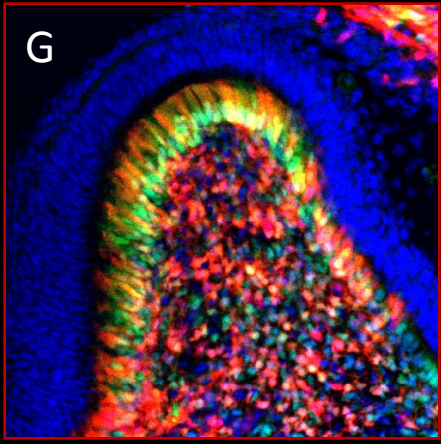
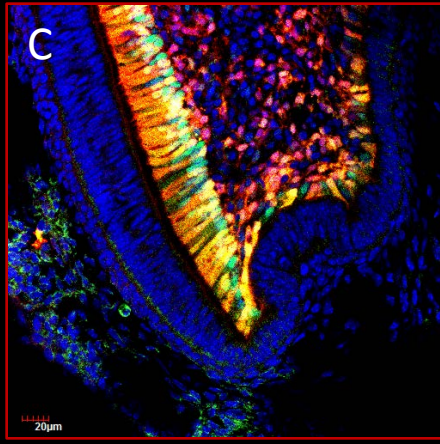
1st Molar @100X



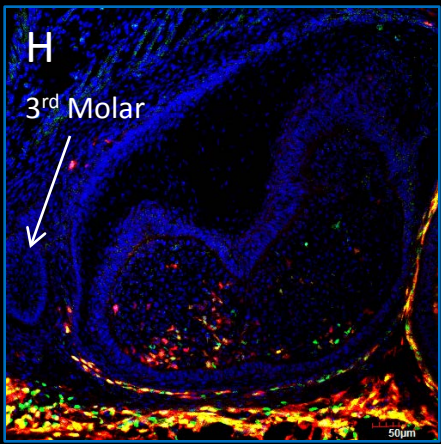
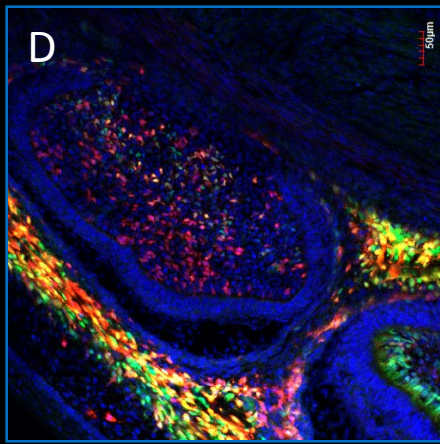
1st Molar @200X



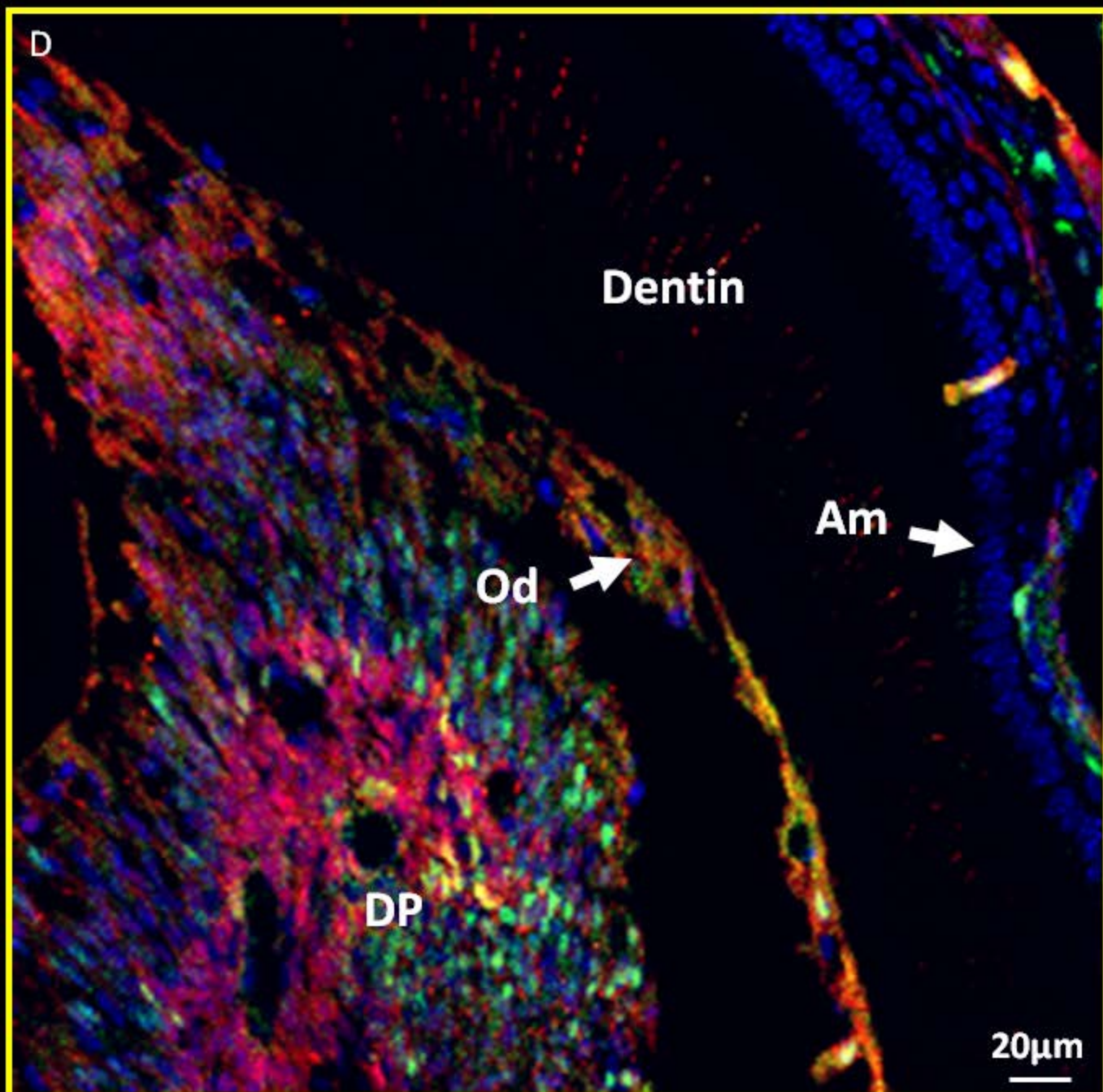
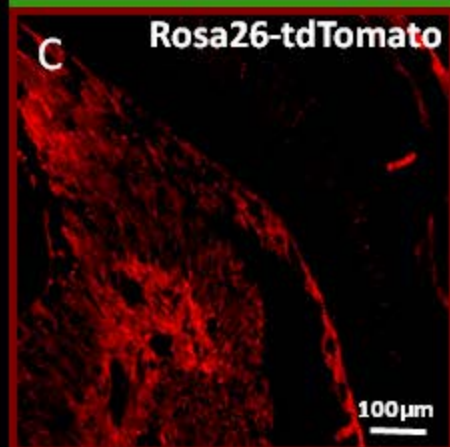
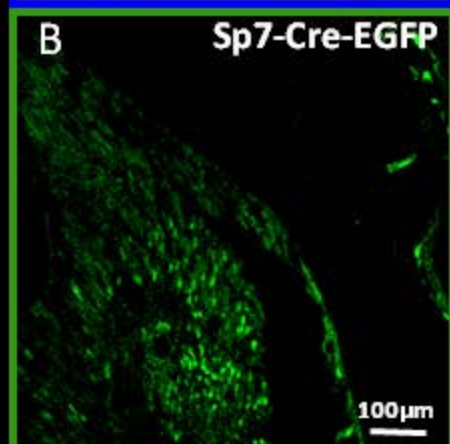
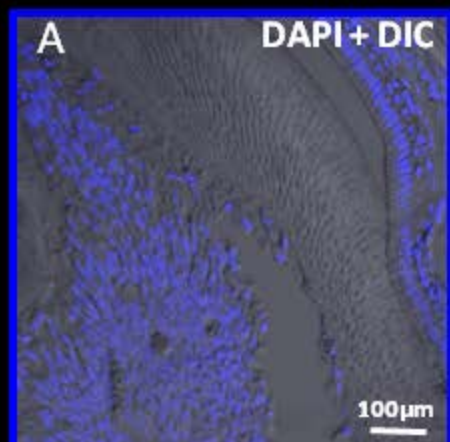
1st Molar @400X



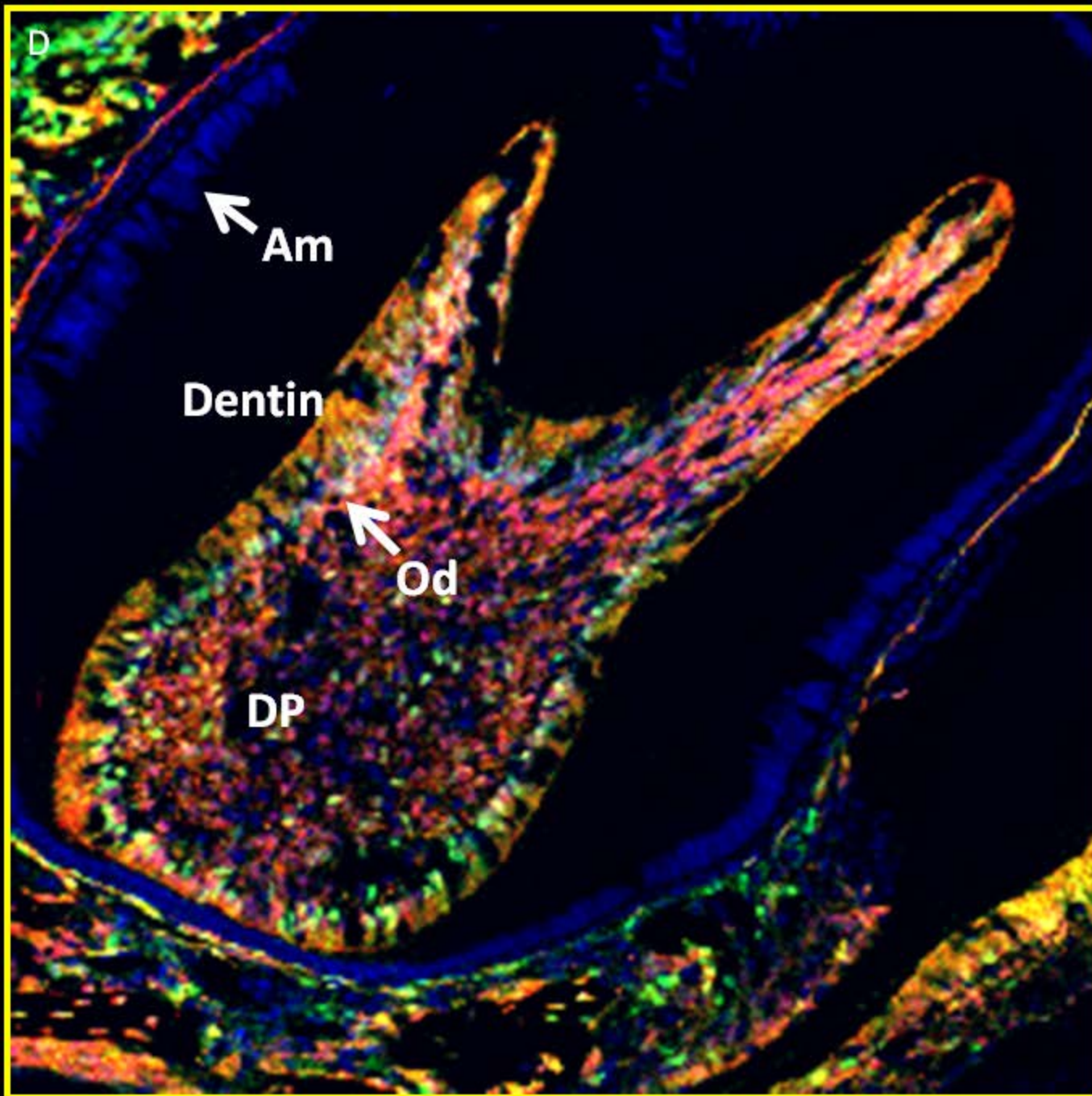
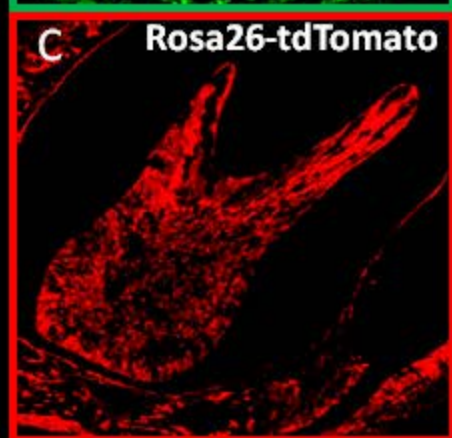
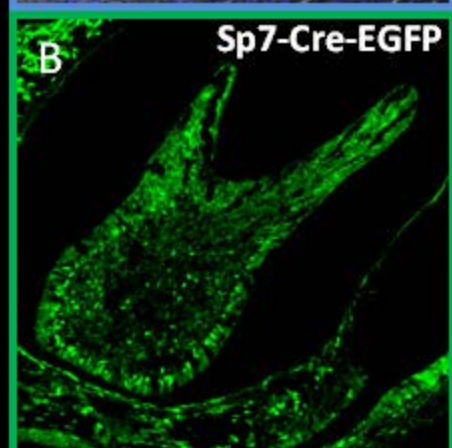
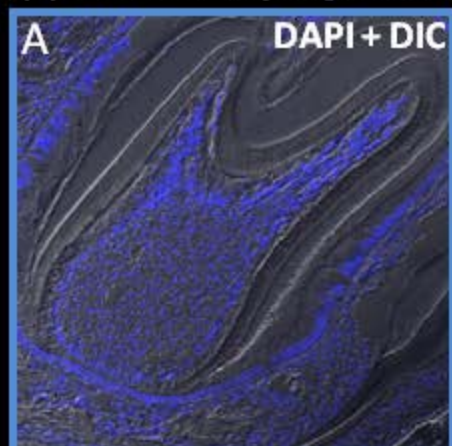
2nd Molar @200X



Supplementary Figure S2



Supplementary Figure S3



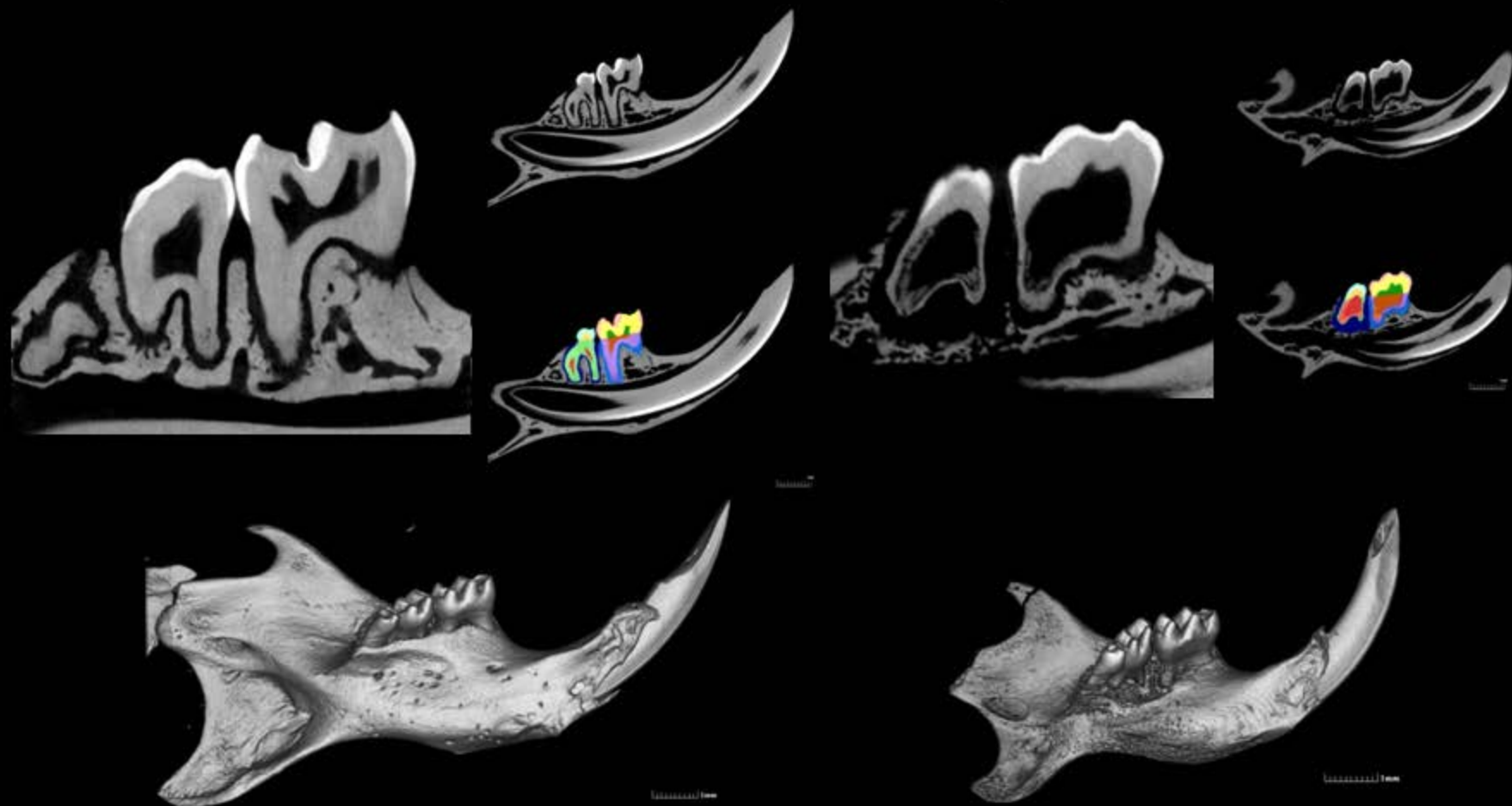
Supplementary Figure S4

1st Molar 2nd Molar

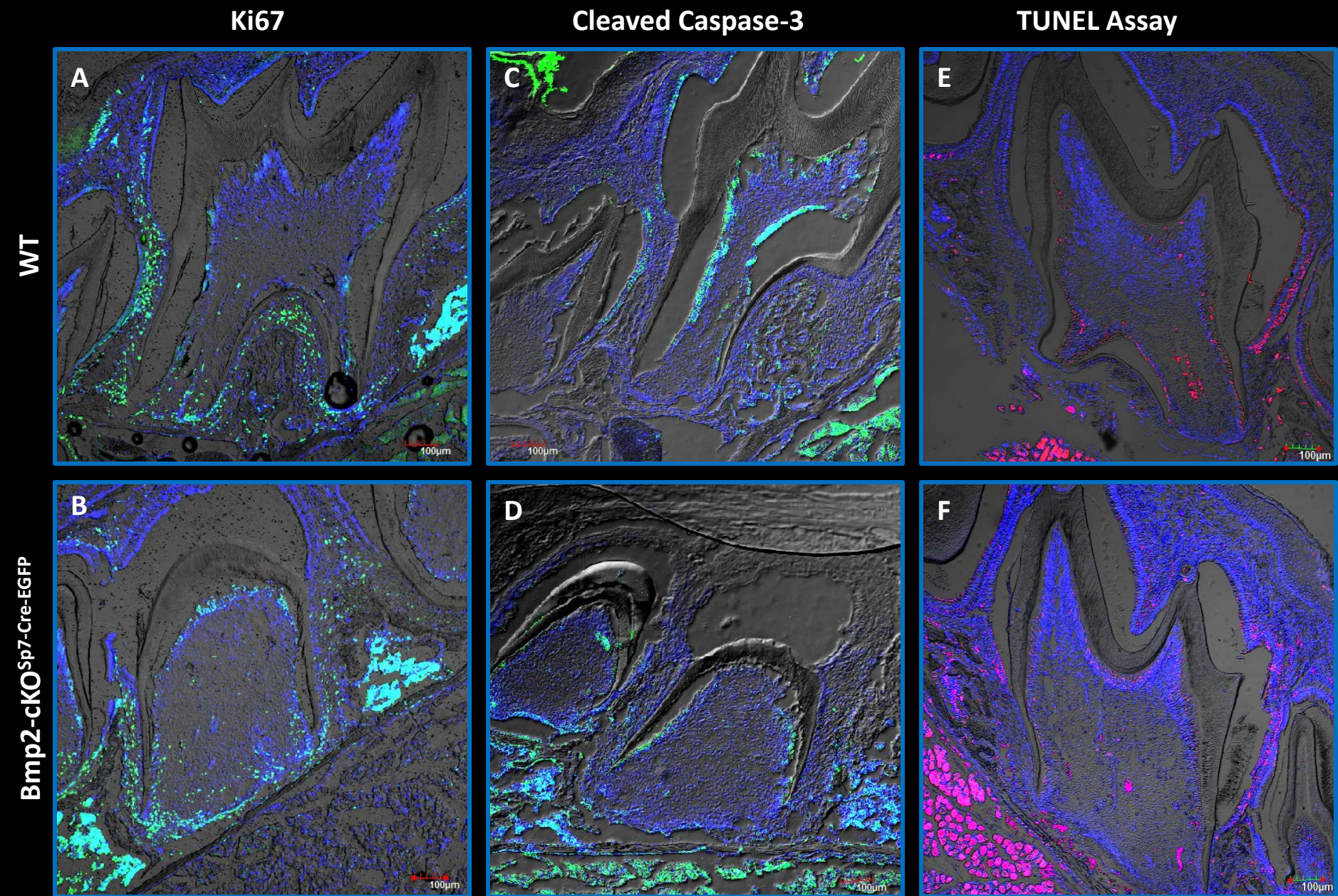
Enamel	Crown Dentin	Crown Pulp	Enamel	Crown Dentin	Crown Pulp
Root Dentin	Root Pulp	PDL	Root Dentin	Root Pulp	PDL

A Control

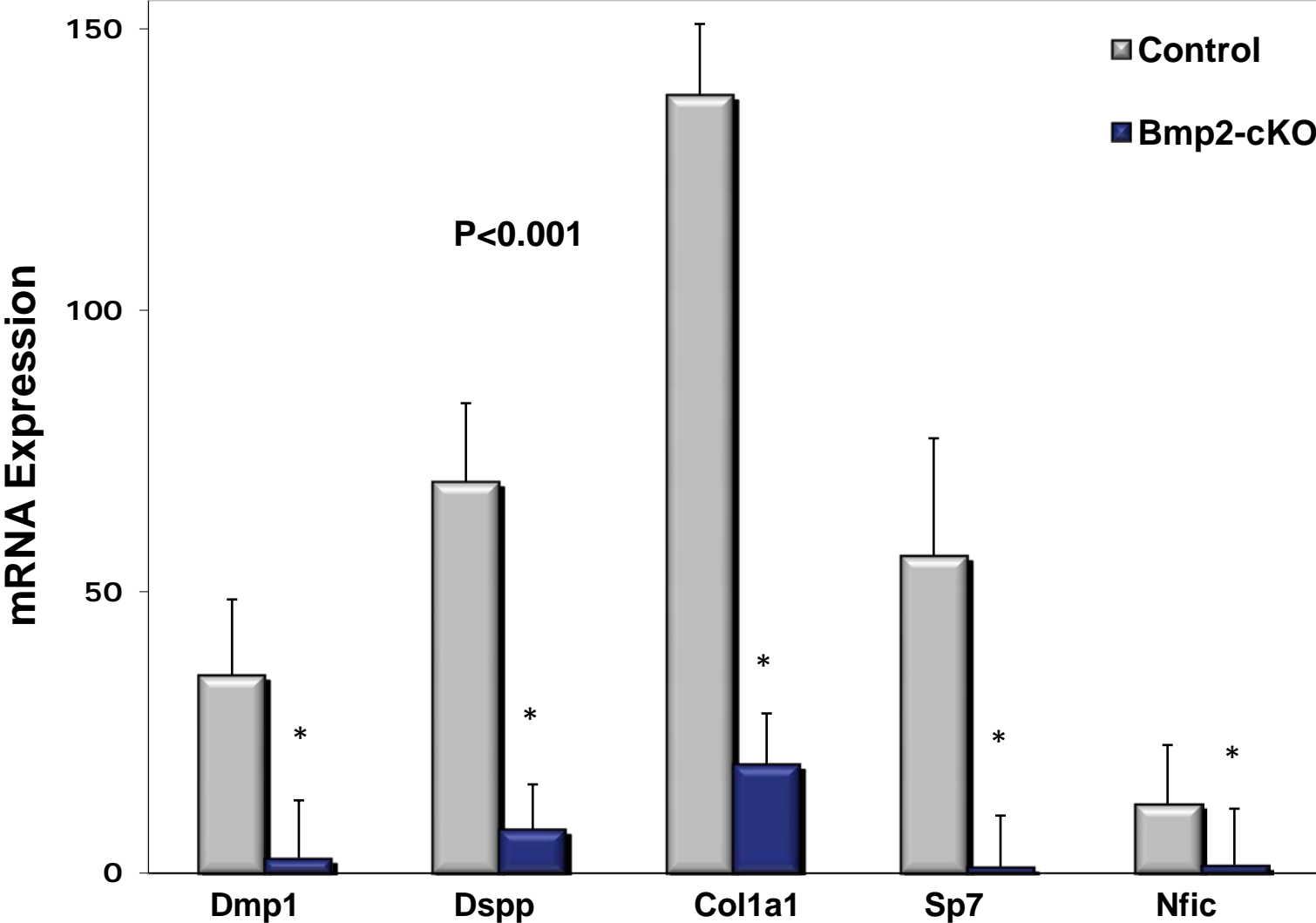
B Bmp2-cKO^{Sp7-Cre-EGFP}



Supplementary Figure S5



Supplementary Figure S6



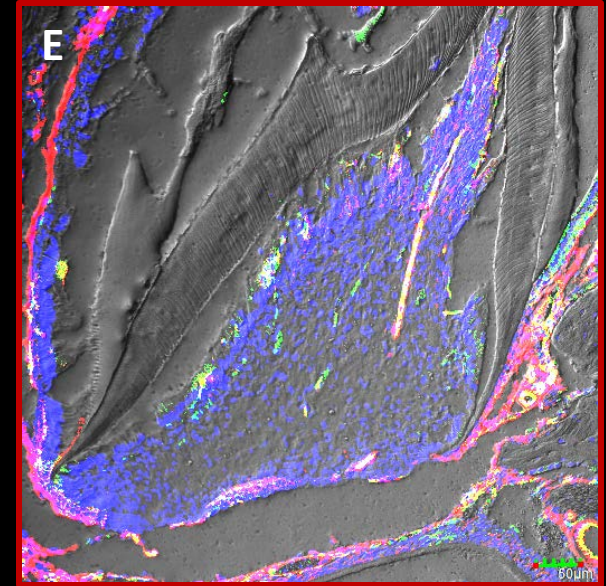
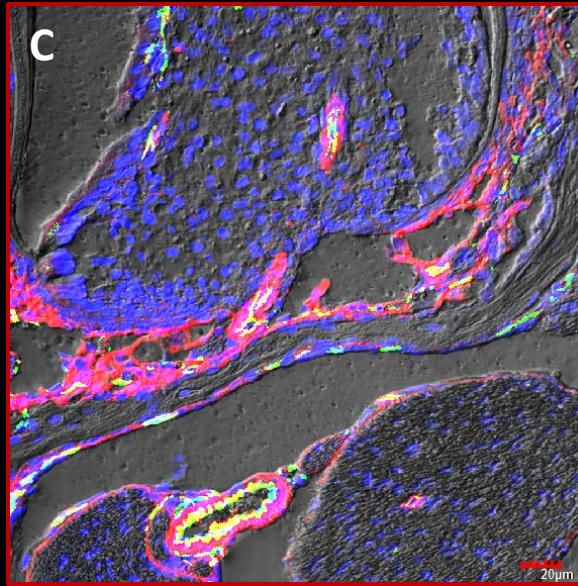
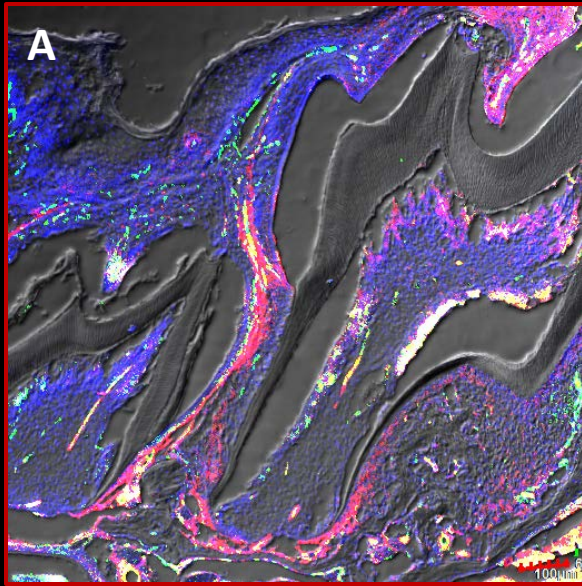
Supplementary Figure S7

Molars @ 100X

2nd Molar Roots @ 400X

3rd Molar @ 200X

WT



Bmp2-cKO^{Sp7-Cre-EGFP}

