

Supplemental Materials

STIM1 a calcium sensor promotes the assembly of an ECM that contains Extracellular vesicles and factors that modulate mineralization

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1. Supplement Figure S1: Localization of STIM1 and Orai1 in the mandibles of wild type and STIM1 KO mice:

- A.** Expression of STIM1 in the differentiating odontoblasts, alveolar bone and dental pulp cells in 2-month old WT and STIM1 KO mouse heads. Boxes indicated as 1 and 2 have been magnified and the corresponding images are shown in the panel. P=pulp; OD=odontoblasts, Den = dentin and AB=alveolar bone.
- B.** Quantification of the immunohistochemical positive signals in odontoblasts (Od), pulp= (P) and alveolar bone (AB). Statistical significance: **p<0.01.
- C.** Colocalization of STIM1 (green) and Orai1 (Red) in the dental pulp of day5 wild type mice.

2. Supplement Figure S2: Gene expression analysis at day 0 in transgenic DPSCs:

Gene expression analysis of the “early” and “late” differentiation markers expressed in control and genetically modified DPSCs at day 0. Statistically significant differences are indicated. *: p<0.05, **: p<0.01.

3. Supplement Figure S3: Characterization of the crown and root dentin by micro-computed tomographic analyses:

Dentin thickness, Dentin volume fraction (BV/TV) and tissue mineral density (TMD) are shown for 1, 2 & 3 month WT and STIM1 knockout

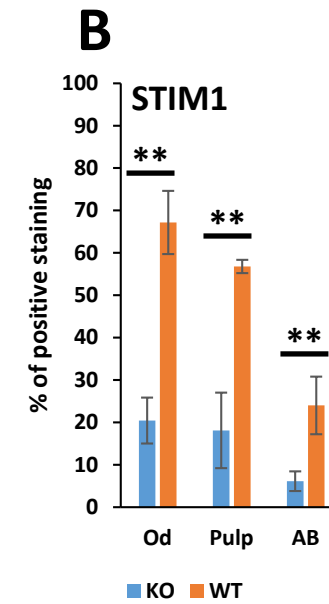
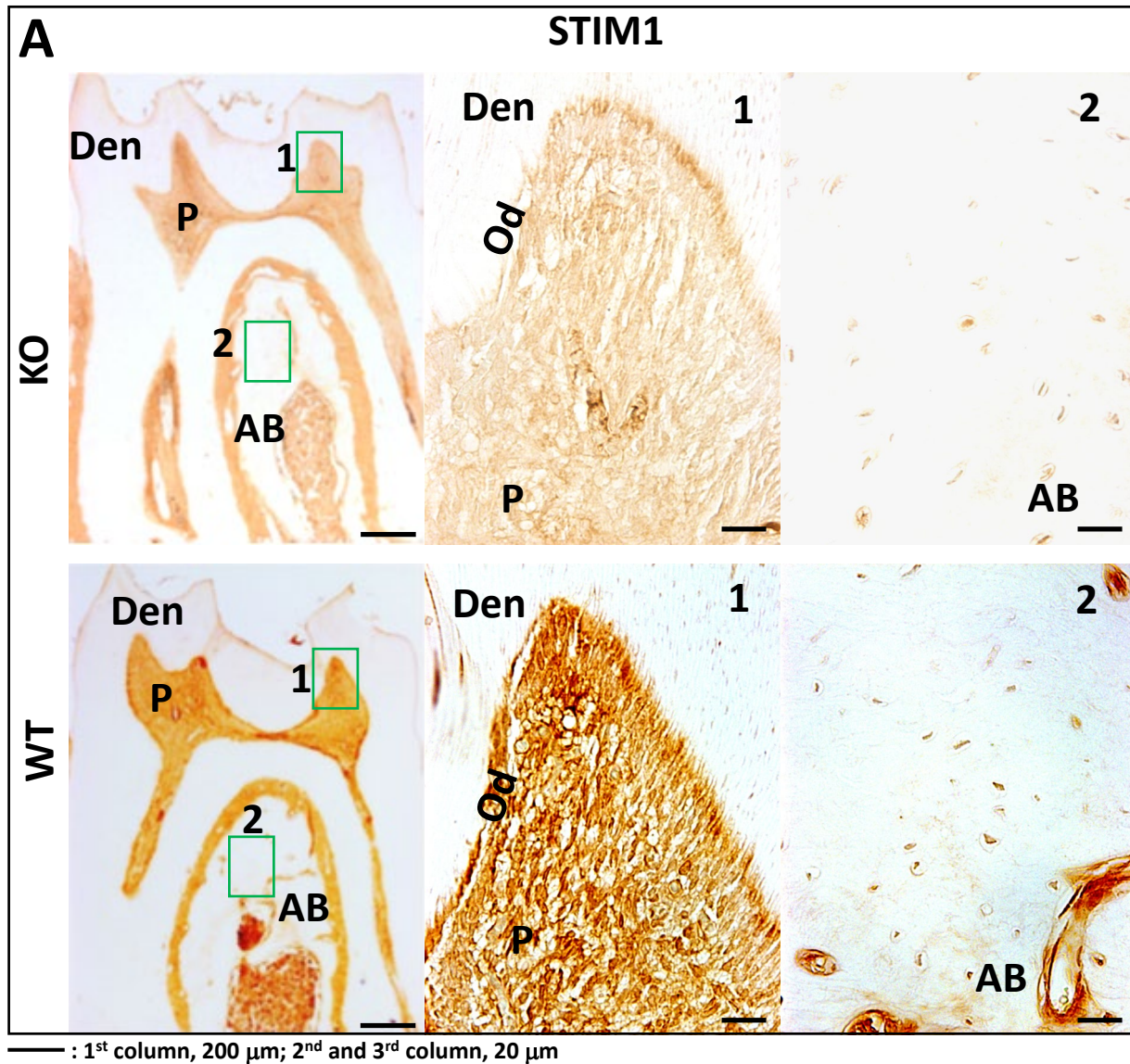
mice. Statistically significant differences are indicated. *: $p < 0.05$, **: $p < 0.01$.

4. Supplement Figure S4: Characterization of the root dentin by μ CT

Representative micro-CT image of the first molar in 1, 2 & 3 months WT and STIM1-KO mice (n=6). The regions contoured for measuring dentin thickness were illustrated as red circles. Note reduced dentin thickness in 1, 2 and 3M STIM1-KO mice. Statistical significance: *: $p < 0.05$.

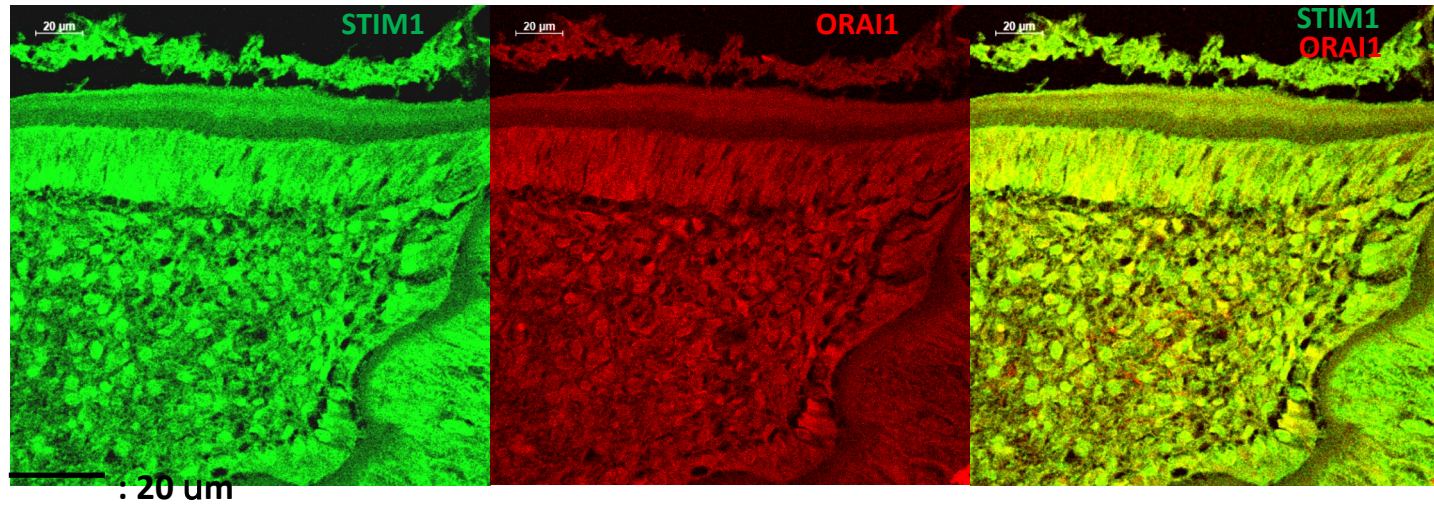
5. Supplement Figure S5: Live-cell imaging showing changes in spatial distribution of STIM1:

Time-lapse imaging to show the spatial distribution of CFP-STIM1 in DPSCs in response to ER Ca^{2+} depletion by 500ng/ml of DMP1.

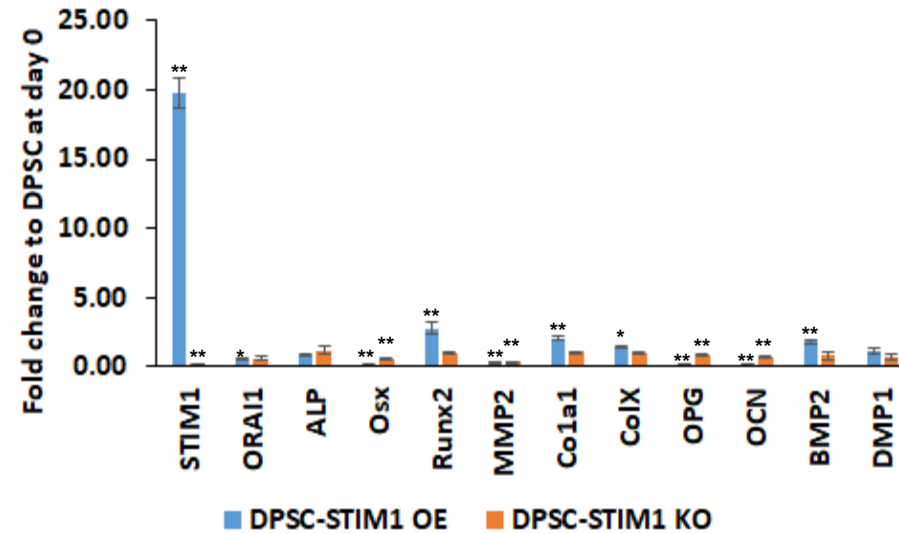


Supplemental Fig S1A-B: Localization of STIM1 and Orai1 in the mandibles of wild type and STIM1 KO mice:

C



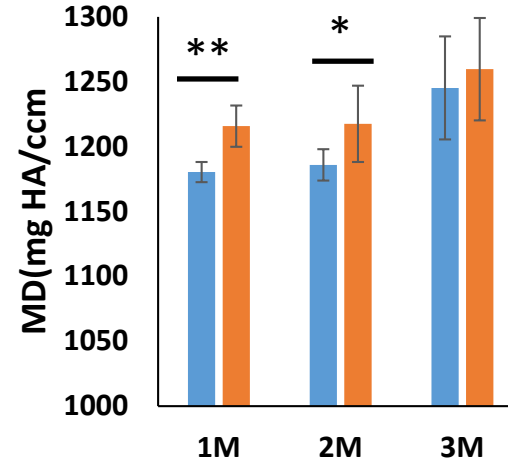
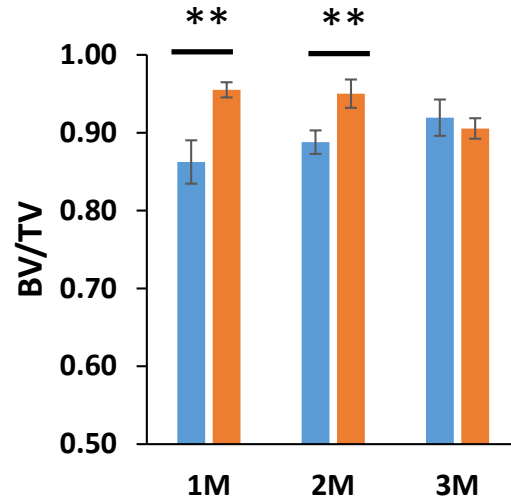
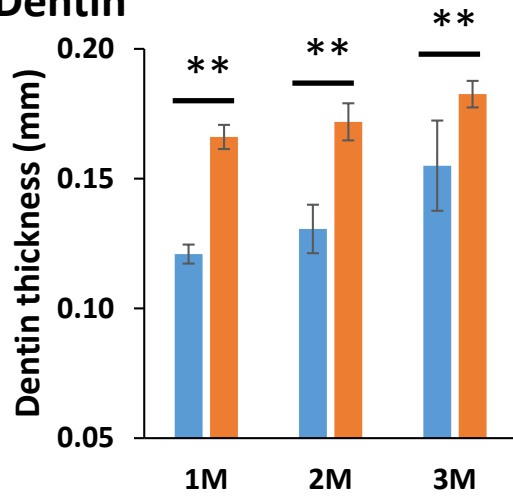
Supplemental Fig S1C: Localization of STIM1 and Orai1 in the mandibles of 5 day wild type mice



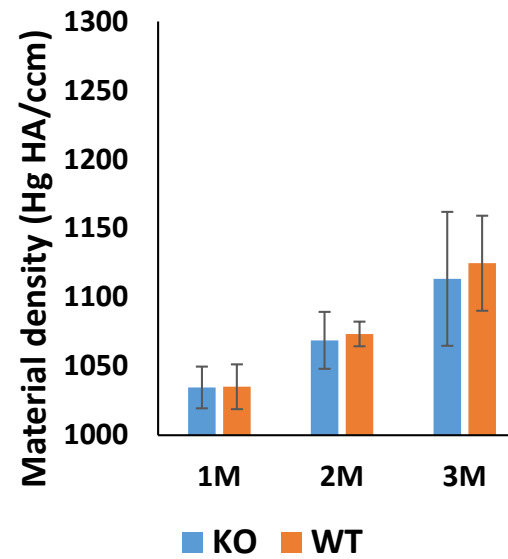
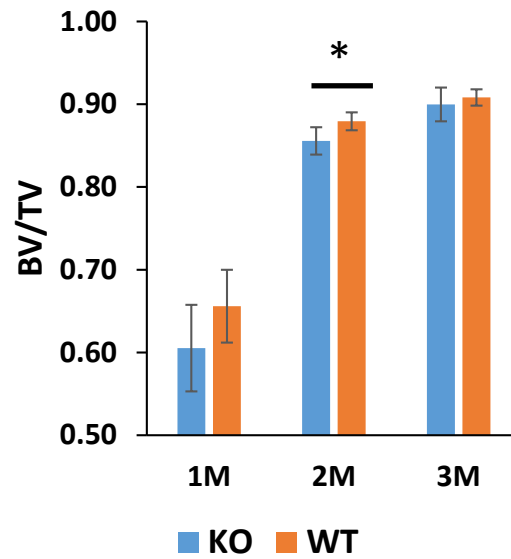
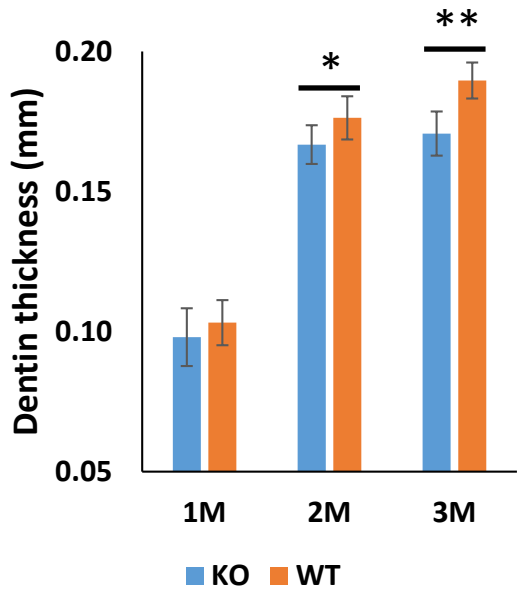
*: p<0.05, **: p<0.01

Supplement Figure S2: Gene expression analysis at day 0 in transgenic DPSCs

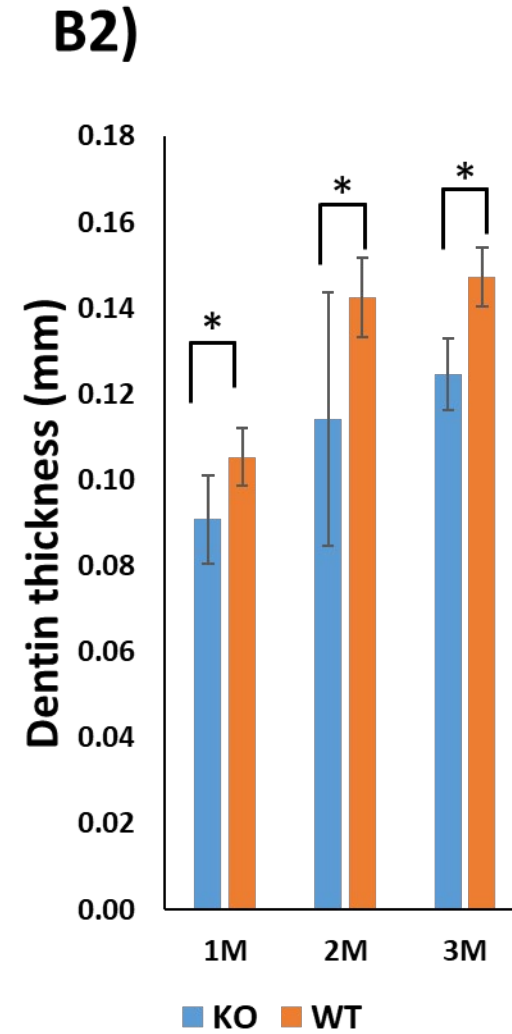
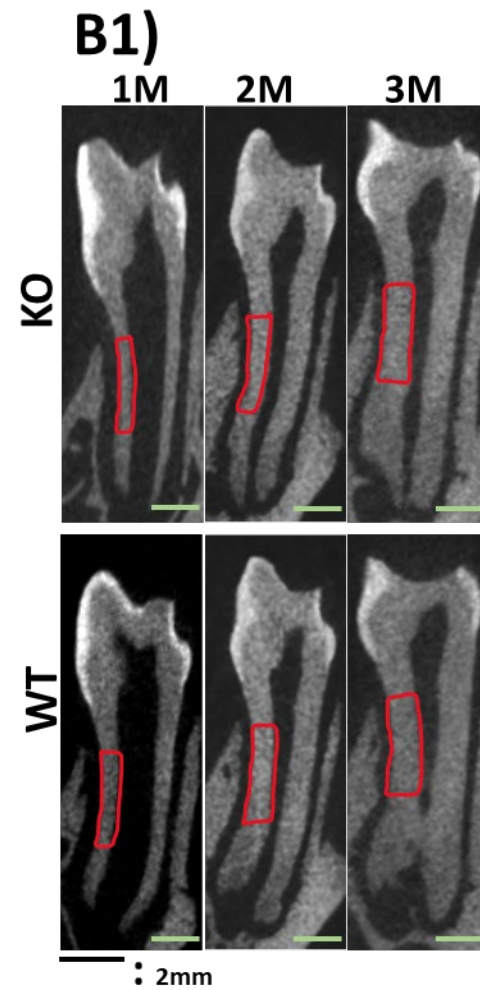
Crown Dentin



Root Dentin

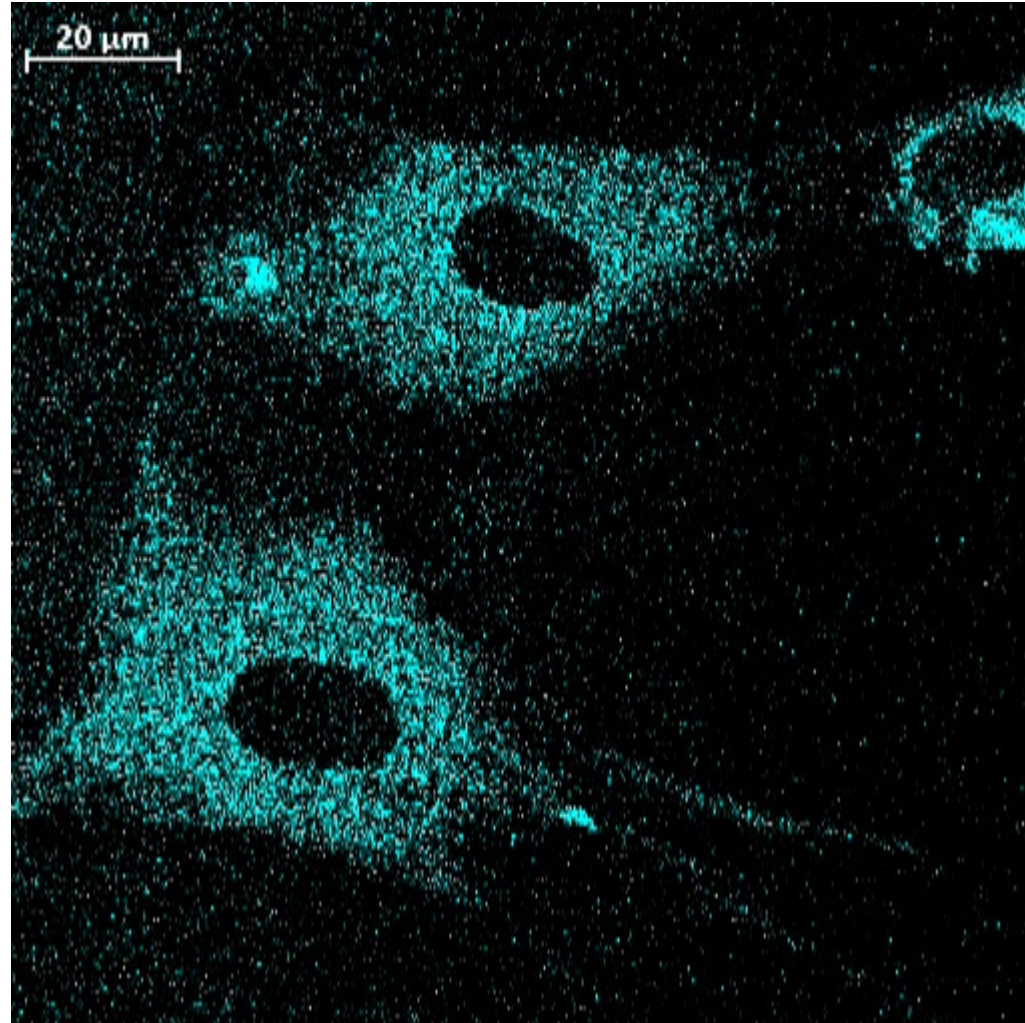


Supplement Figure S3: Characterization of the crown and root dentin by micro-computed tomographic analyses



Supplement Figure S4: Characterization of the root dentin by μ CT

Movie



Supplement Figure S5: Live-cell imaging showing changes in spatial distribution of STIM1