SUPPLEMENTARY INFORMATION

Practical whole-tooth restoration utilizing autologous bioengineered tooth germ transplantation in a postnatal canine model

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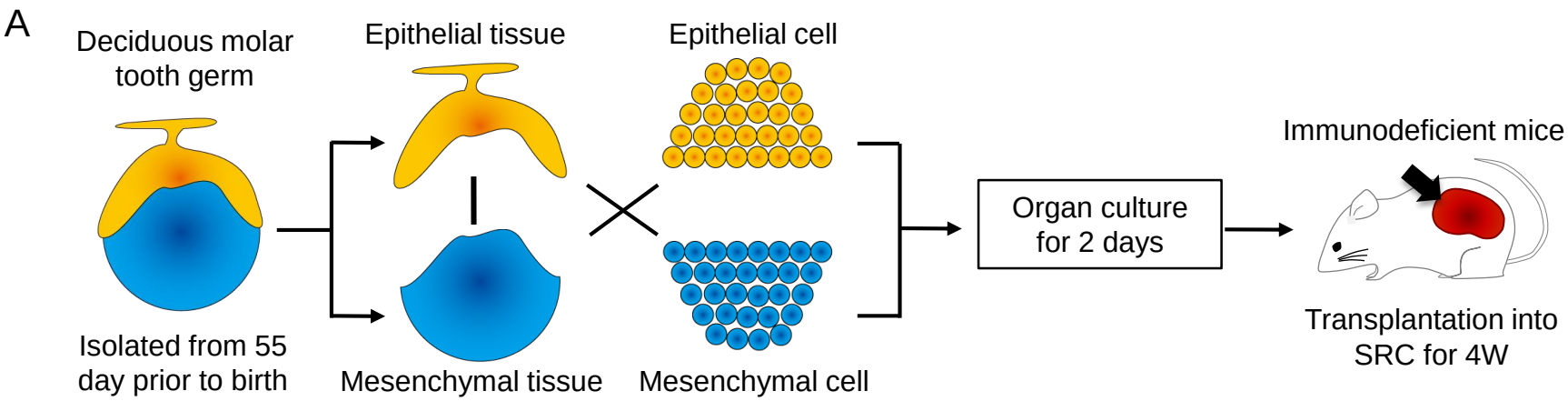
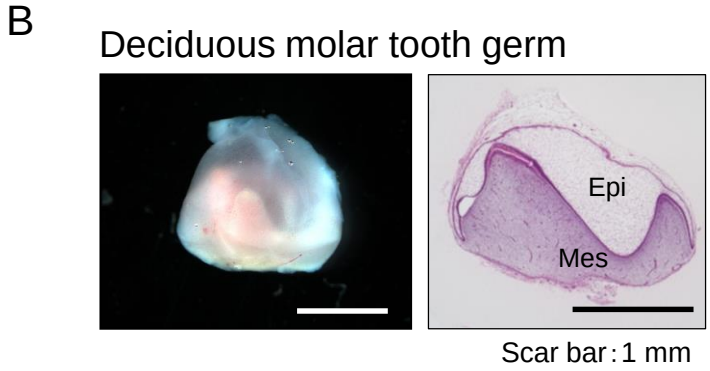
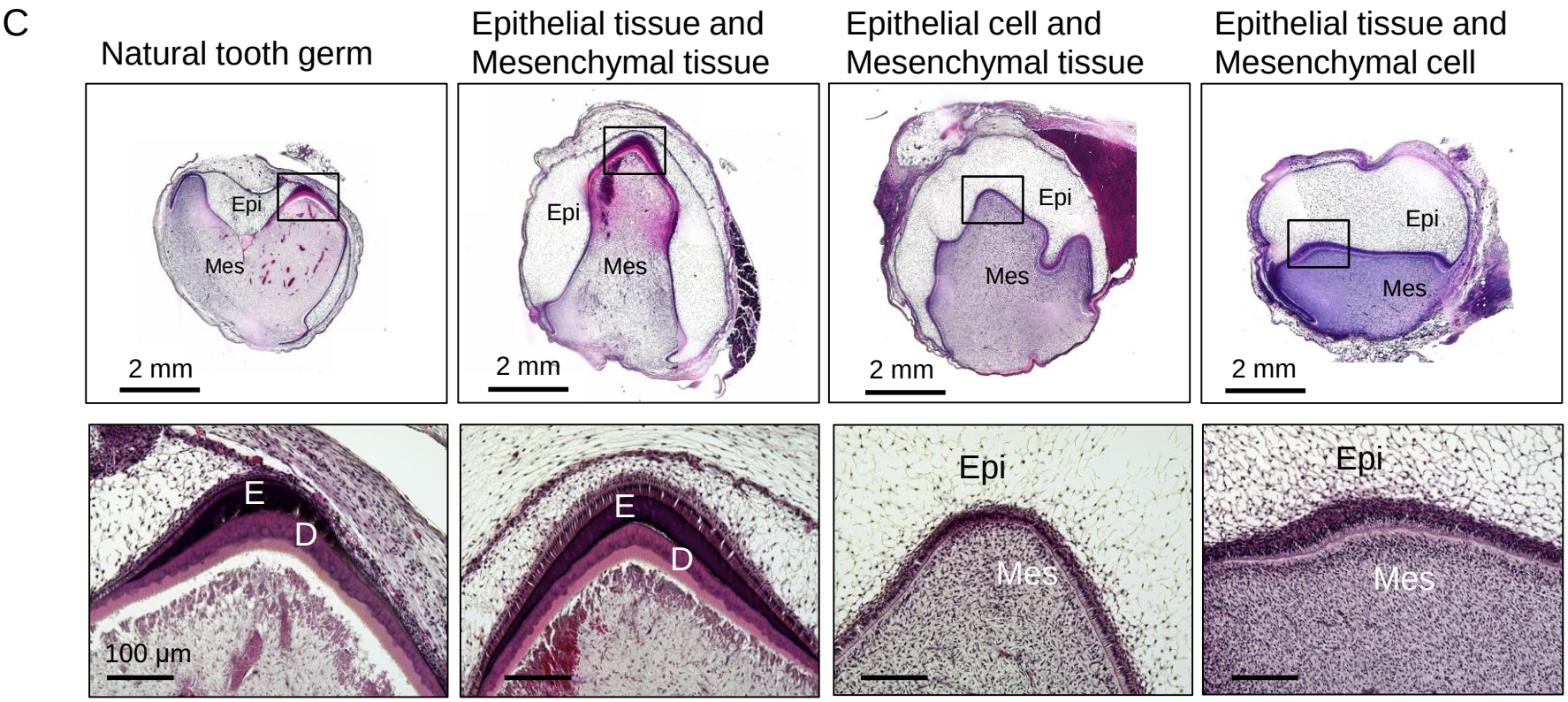
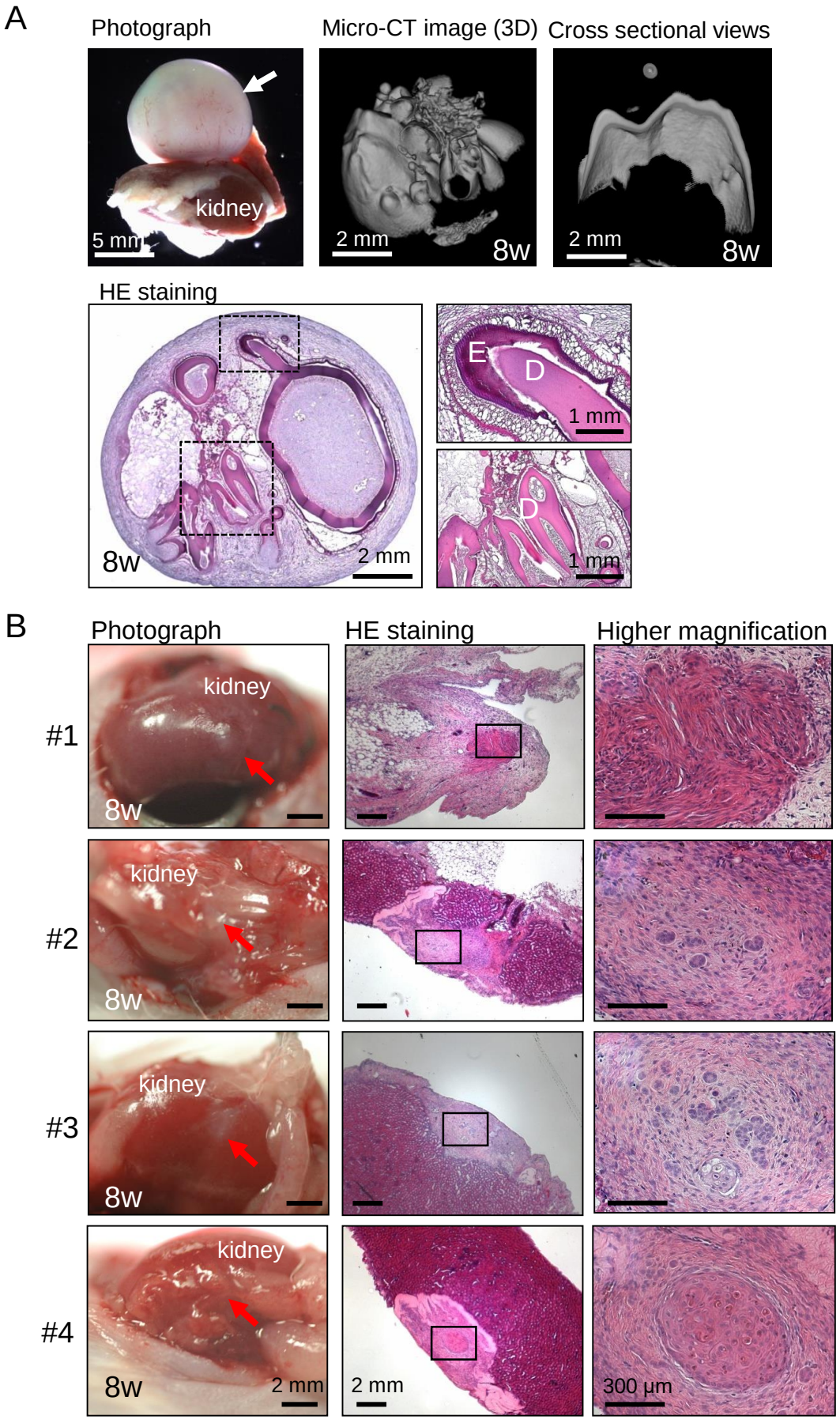


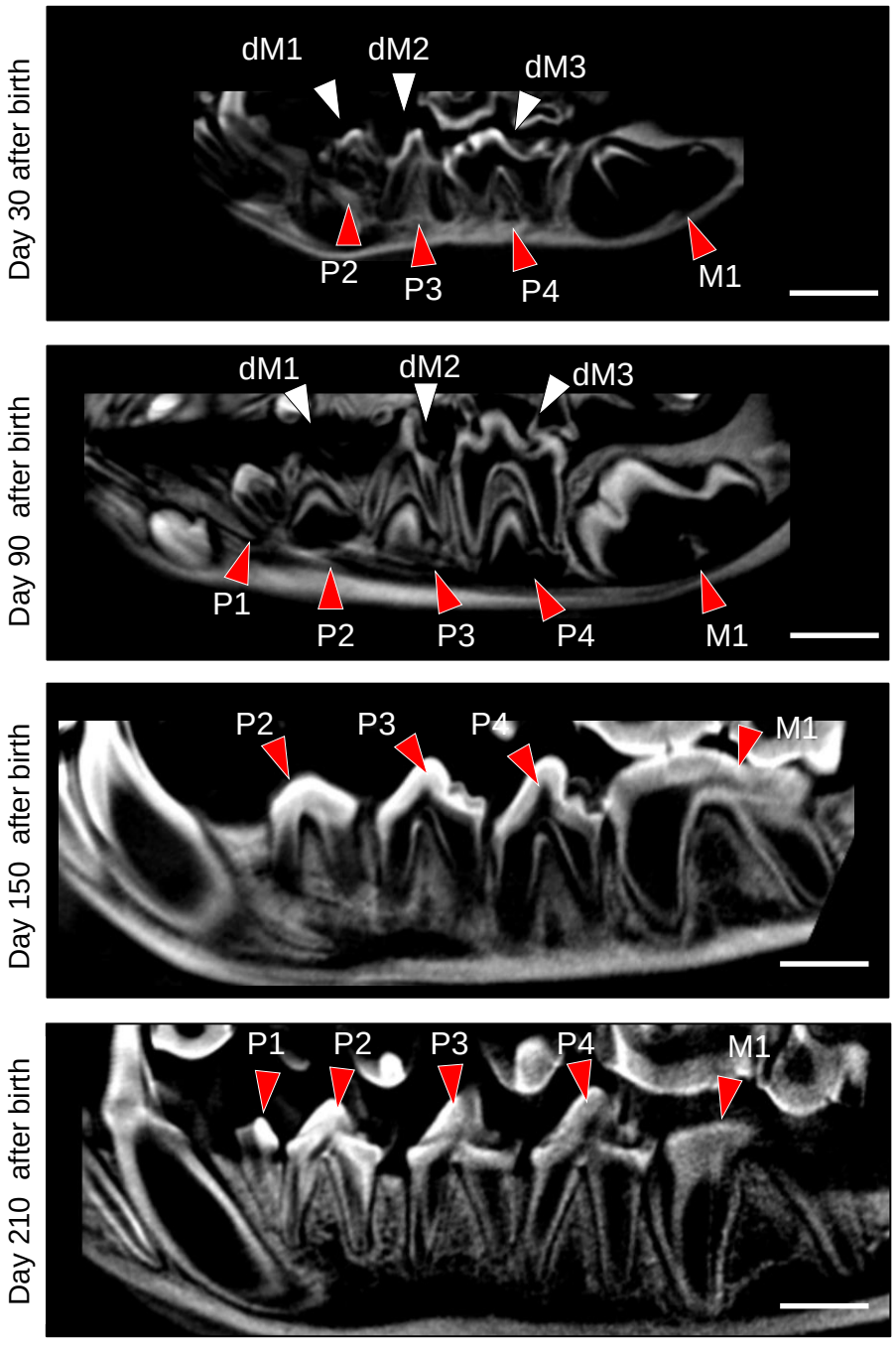




Supplemental Figure 1, Ono *et al.*



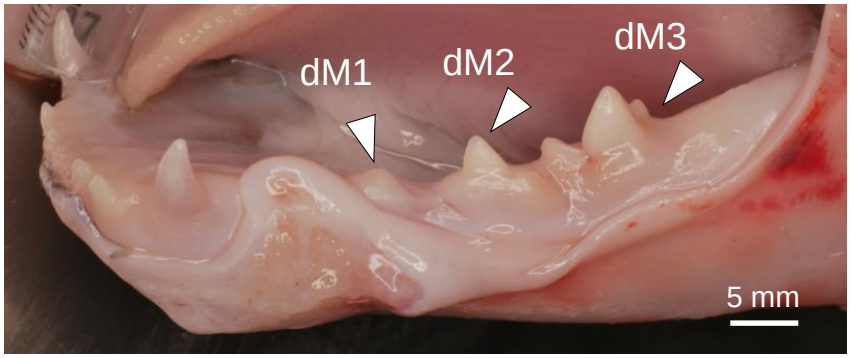
Supplemental Figure 2, Ono *et al.*



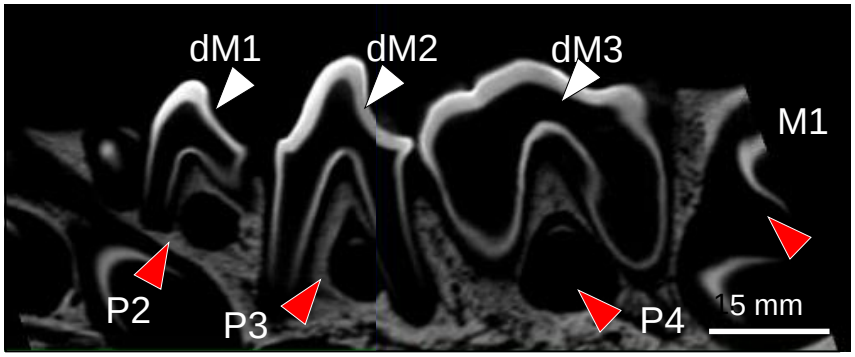
Scale bar: 10 mm

Supplemental Figure 3, Ono *et al.*

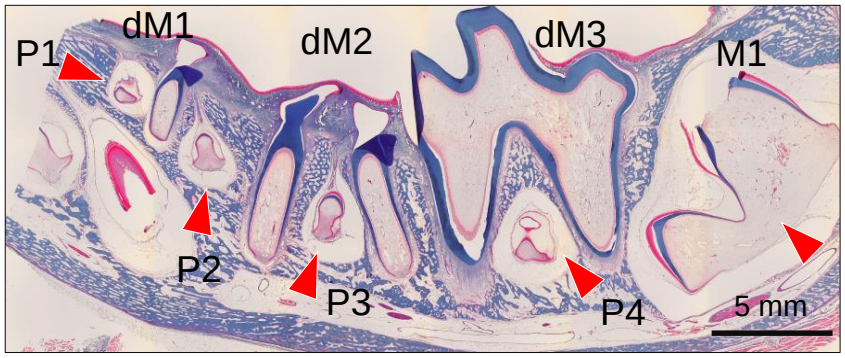
A Photograph



B Micro CT image



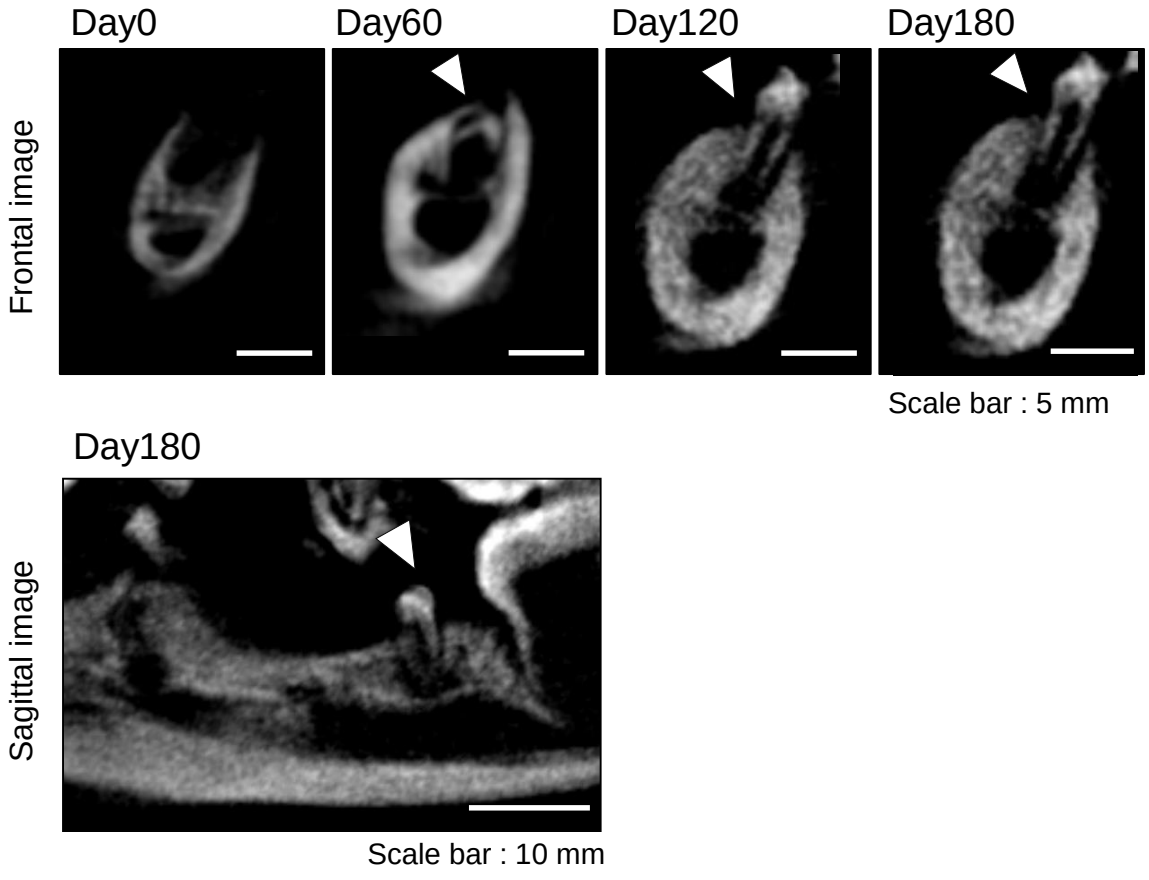
C Toluidine blue staining



Deciduous molar

Permanent Premolar & Molar germ

Supplemental Figure 4, Ono *et al.*



Supplemental Figure 5, Ono *et al.*

Legends to Supplemental Figures

Supplemental Fig. 1. Generation of the bioengineered tooth under the various reconstructing conditions.
(A) Schematic representation of various reconstructing conditions for bioengineered tooth germ. (Illustration by R.N.) (B) Photograph and histological image of deciduous molar tooth germ. Epi, epithelial tissue; Mes, Mesenchymal tissue. (C) Histological analysis of the bioengineered tooth at 4 weeks after subrenal capsule transplantation under the various reconstructing conditions. Boxes indicate the area shown at higher magnification in the lower panels. E, enamel; D, dentin; Epi, epithelial tissue; Mes, mesenchymal tissue.

Supplemental Fig. 2. Generation of bioengineered tooth in the reconstructing condition of epithelial cells and mesenchymal cells.
(A) The frequency of bioengineered tooth generation was low (16.7%) in the reconstructing condition of epithelial cells and mesenchymal cells. In a few successful samples, the bioengineered tooth germ developed into subrenal capsule (*upper, white arrow*) and showed tooth-crown formation in micro-CT analysis (*upper*). Histological analysis of the bioengineered tooth showed the tooth tissue structure, including the enamel and dentin, which were equivalent to those of the natural tooth (*lower*). Boxes indicate the area shown at higher magnification. E, enamel; D, dentin.
(B) The majority of samples (83.3%) in the reconstructing condition of epithelial cells and mesenchymal cells did not show the development of the bioengineered tooth into the subrenal capsule (*left panels, red arrow*). These samples did not show tooth tissue structures such as enamel, dentin, pulp or PDL (*centre and right panels*). Boxes indicate the area shown at higher magnification.

Supplemental Fig. 3. CT images at various tooth developmental stages in the canine mandible.
CT images of canine tooth development in the mandible at postnatal days 30, 90, 150 and 210. White arrowhead, deciduous molars (dM1, dM2 and dM3); Red arrowhead, permanent premolars (P1, P2, P3 and P4) and permanent first molar (M1).

Supplemental Fig. 4. Micro-CT and histological analysis of the canine mandible at postnatal day 30.
Photograph (A), micro-CT image (B) and histological image obtained by toluidine blue staining (C) of the canine mandible at postnatal day 30. All deciduous molars (dM1, dM2 and dM3) erupted into the oral cavity, and the permanent premolar germs (P2, P3, and P4) were at a developmental stage suitable for the reconstruction of bioengineered tooth germ.

Supplemental Fig. 5. CT images of the bioengineered tooth development.
Continual CT images of bioengineered tooth development at 0, 60, 120 and 180 days after autologous transplantation into the mandible. White arrowhead, bioengineered tooth.