



Iloprost promoted acellular cementum formation *in vivo*

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Introduction



Tooth replantation is one of alternative treatment for edentulous area. Root surface treatment prior to tooth replantation by bioactive molecule or cytokines have been proposed to increase success rate and promoted PDL regeneration. Different substances have been used for the treatment of the root surface of replanted teeth. Iloprost, the prostacyclin analog, was previously shown to induced tertiary dentin formation. However, the roles of iloprost as root surface promoting agent was not yet been clarified.

Objectives

1. To investigate the therapeutic effect of iloprost as an agent for root surface treatment based on the tooth survival rate and tissue healing in a tooth replanted model in rat .
2. To evaluate the effect of iloprost on osteogenic expression of human periodontal ligament cells(hPDLC) *in vitro*.

Results

Materials and Methods

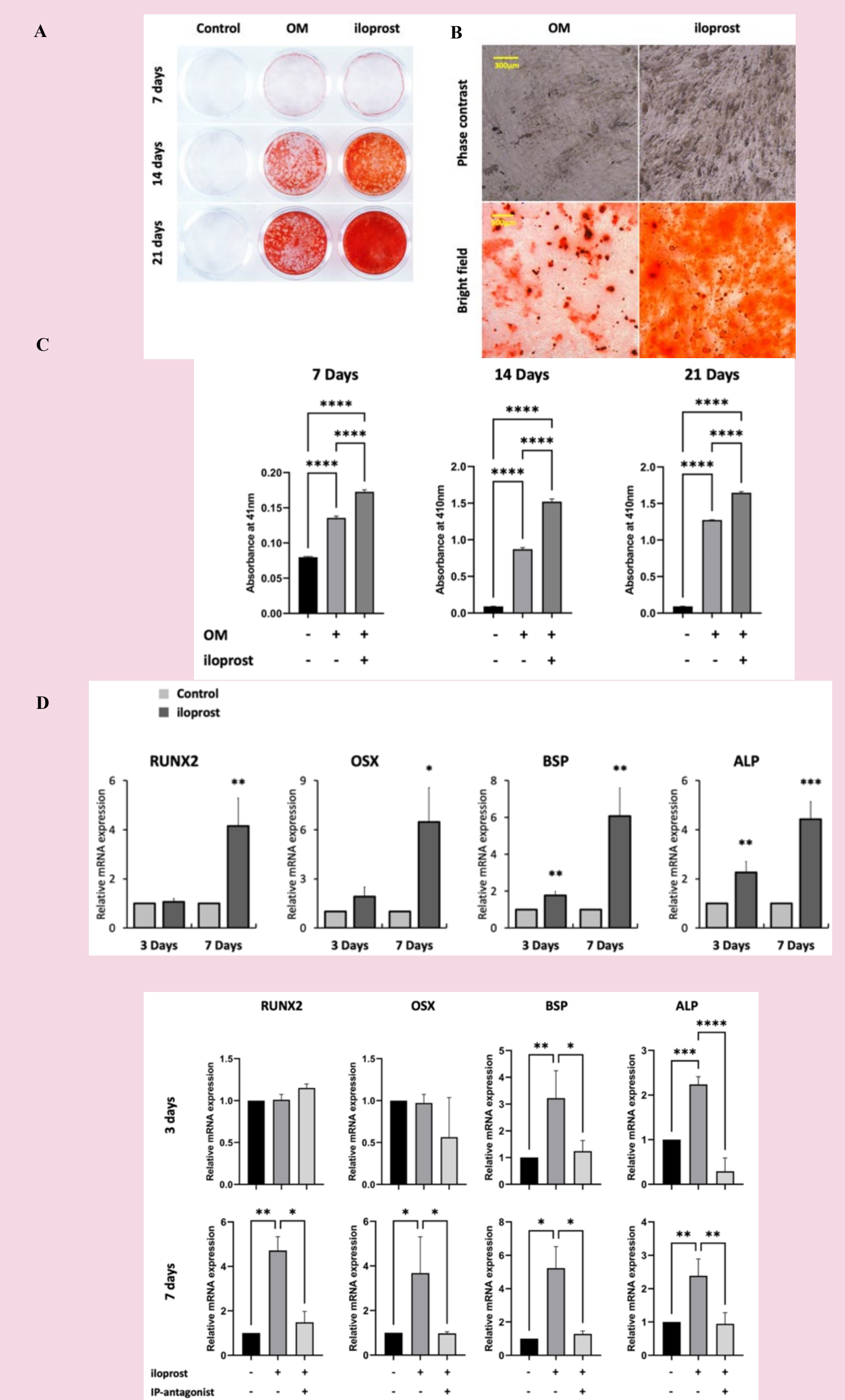
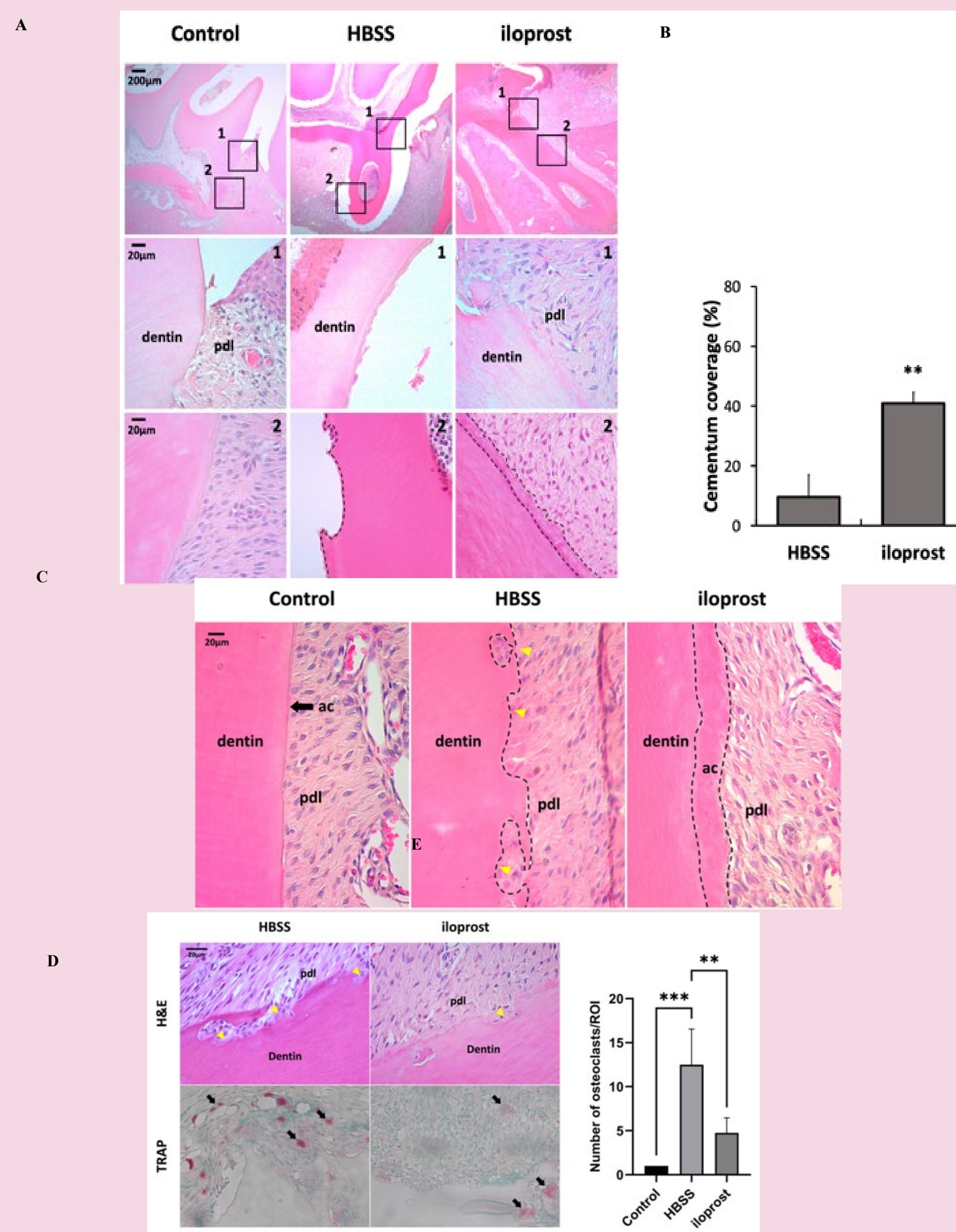
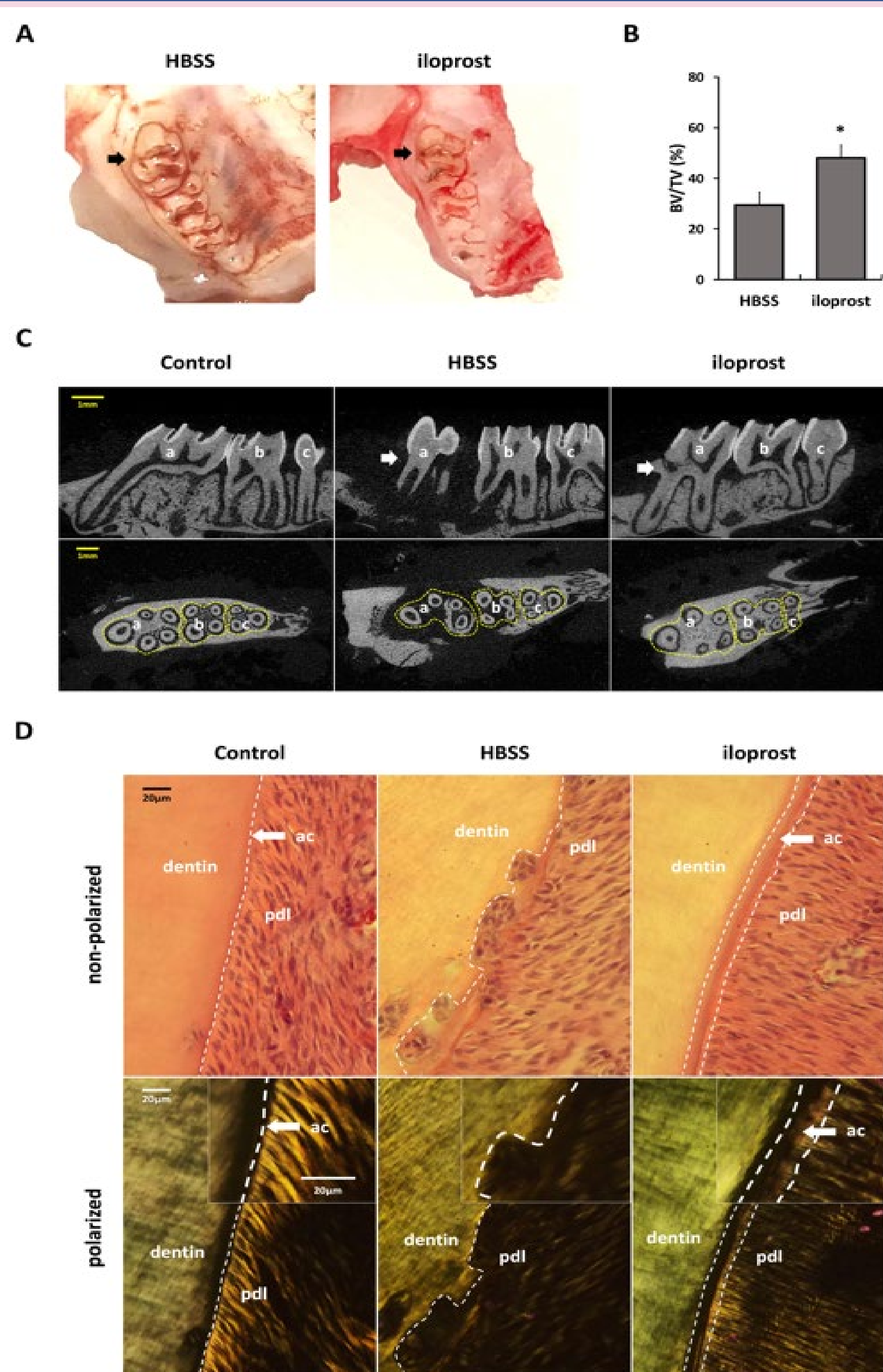
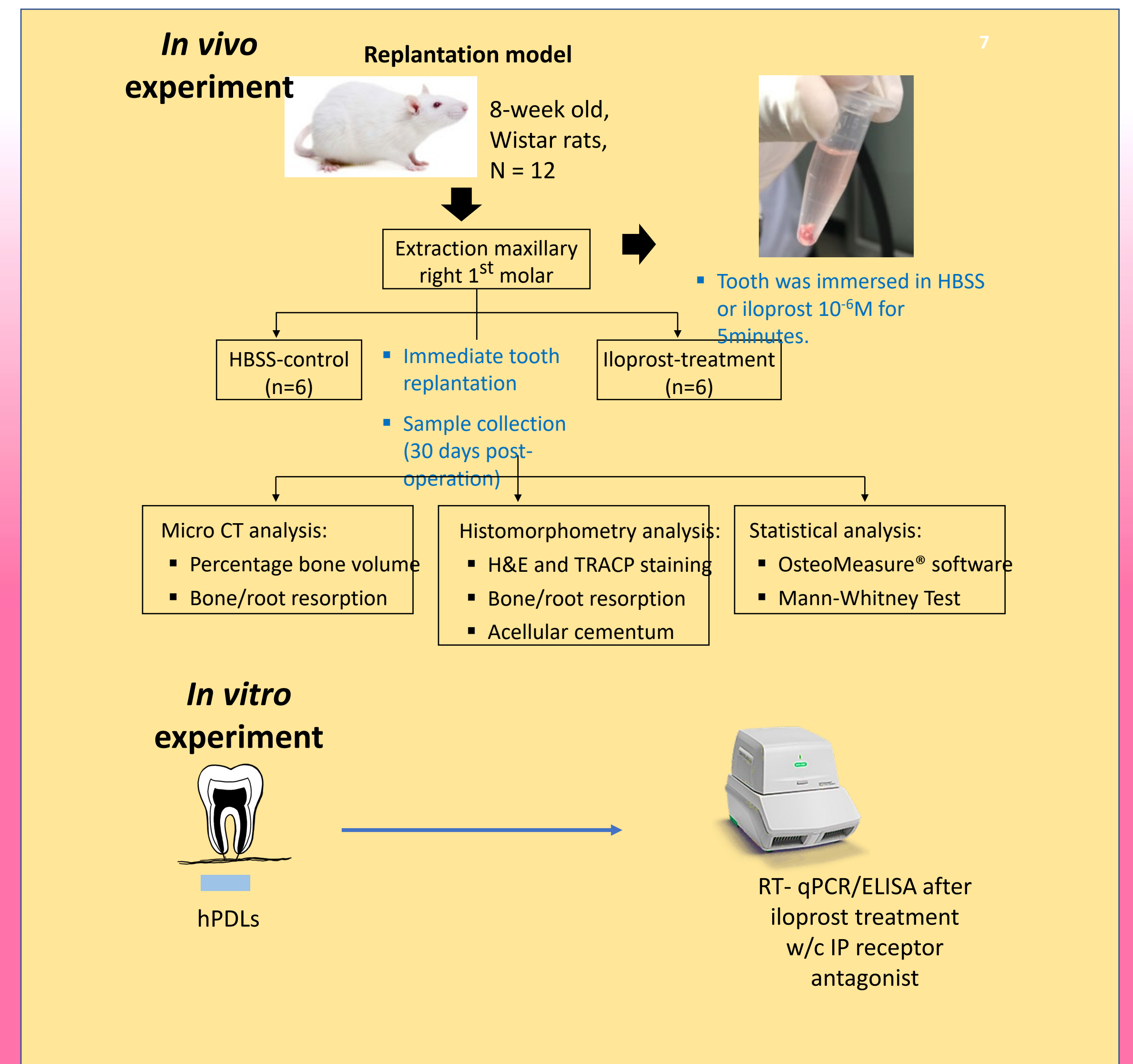


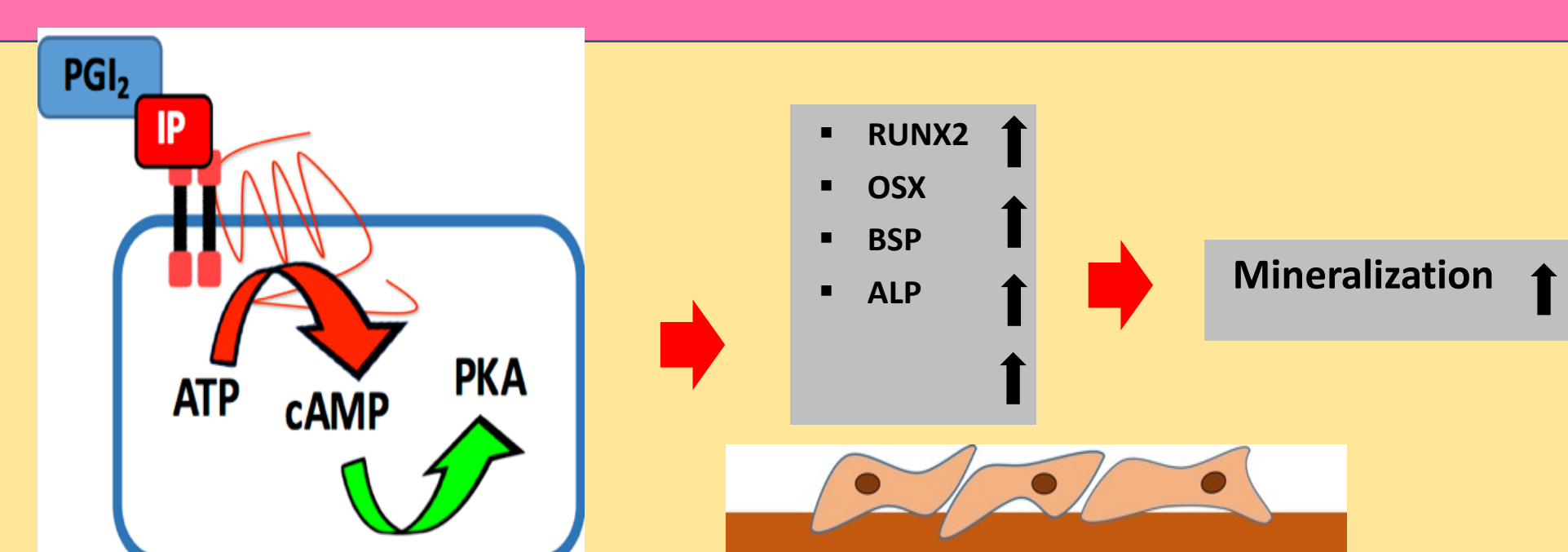
Fig. 1. A. Macroscopic view and MicroCT 3D images of the rat maxilla at 30 days post-operation. B. MicroCT 3D images of the rat maxilla at 30 days. C. BV/TV of the alveolar bone surrounding the replanted tooth. D. Rat first molar sections at 30 days viewed by non-polarized and polarized light microscopy (**P* < .05).

Fig. 2. Histological analyses of the replanted molars at day 30. A. H&E stained sections of the replanted molars. B. Quantification of cementum coverage at 30 day post-operation. C&D. Presence of TRAcP-positive cells, identified by H &E and TRAcP staining. The dark arrows and yellow arrow heads are pointed to osteoclasts and resorption pits, respectively. E. Number of osteoclasts. (***P* < .01 and ****P* < .001).

Fig. 3. Mineralization assay and qRT-PCR analysis. Alizarin red S staining (A), macroscopic view of the hPDLCs in culture before and after staining at day 21 (B), calcium quantification of alizarin red S staining (C), osteogenic mRNA expression of hPDLCs at 3 and 7 days (D). (**P* < 0.05 and *****P* < 0.0001).

Discussion and Conclusion

- Iloprost prevents alveolar bone resorption and maintains retention of the replanted tooth.
- The present study, we did not see any evidence of ankylosis in the treatment group.
- New acellular cementum was observed along the root surfaces in the iloprost group, indicating **PDL re-attachment** on the replanted teeth.



- Treatment of iloprost promotes de novo acellular cementum formation and PDL-reattachment in tooth replantation model in rat.
- This study indicated the clinical value of iloprost as a root surface conditioner for inducing acellular cementum formation that may help increase the success rate in tooth replantation treatment.