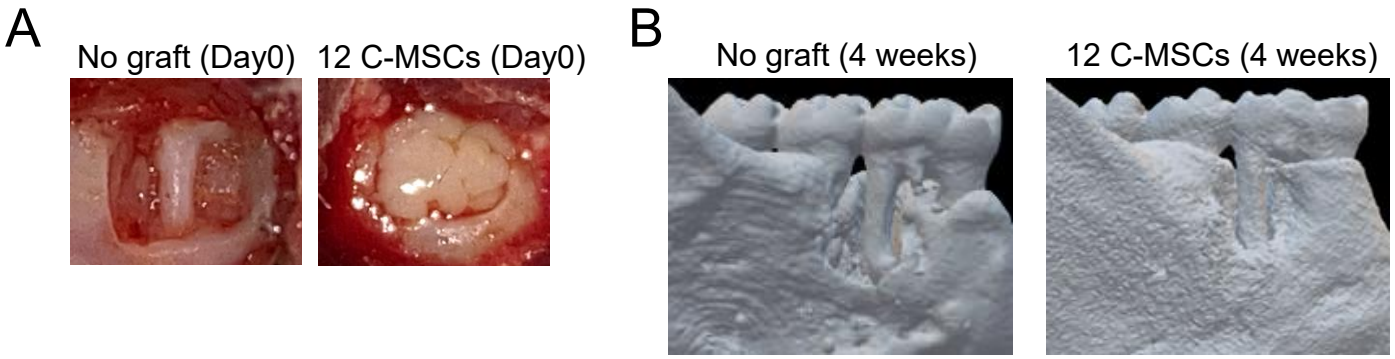
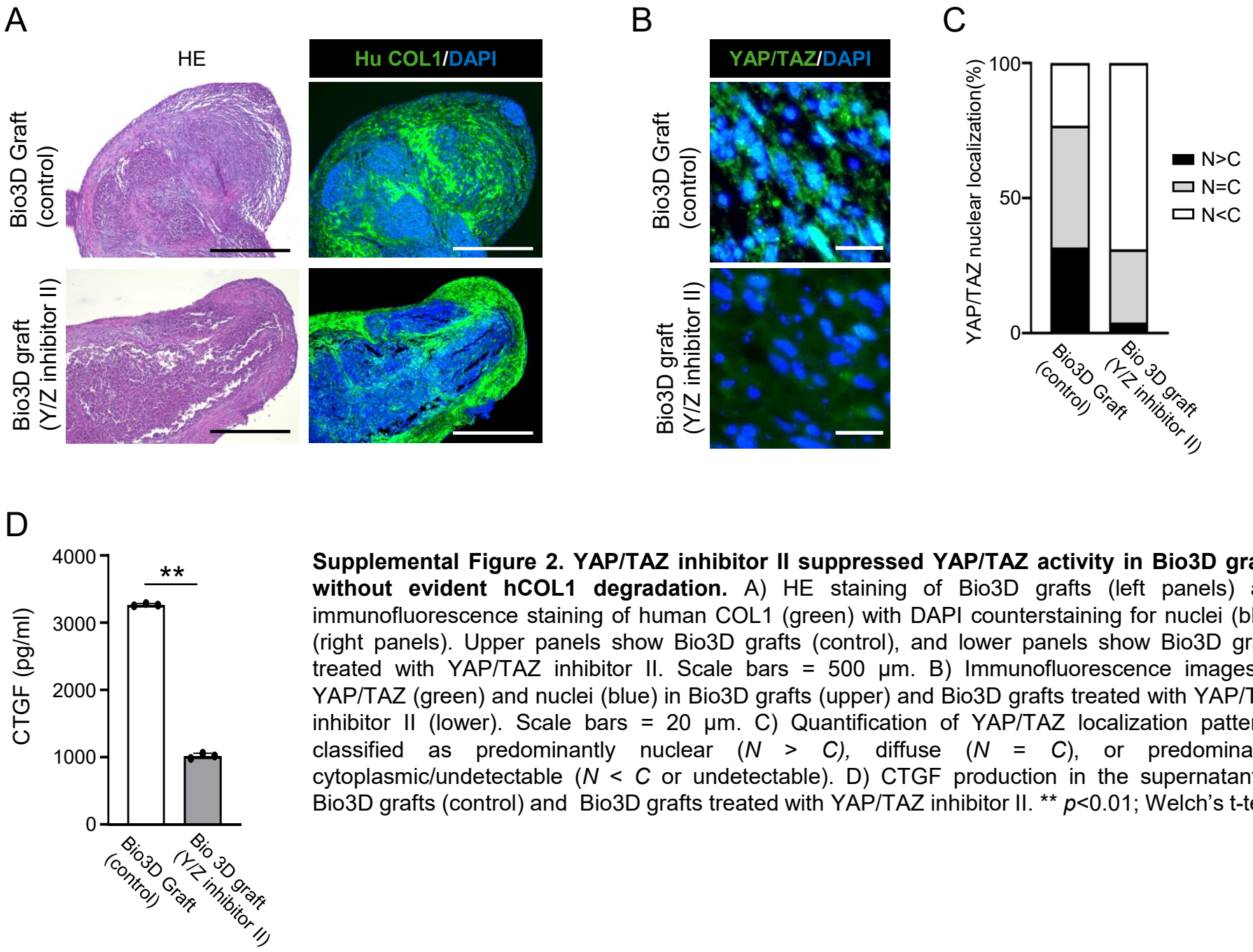
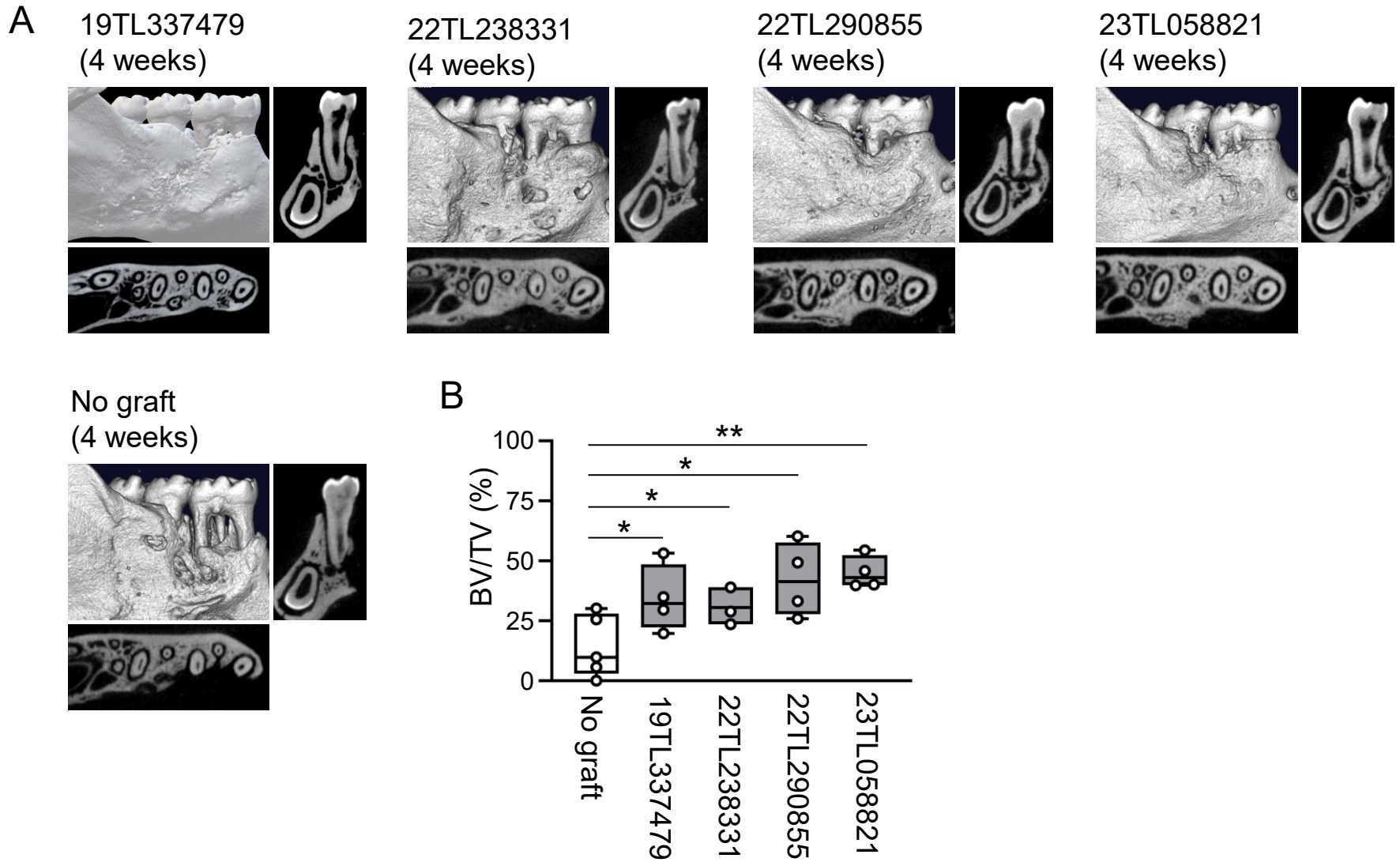


Supplemental Figure 1. Transplantation of human 12 C-MSCs failed to induce successful periodontal tissue regeneration in nude rat periodontal tissue dehiscence defect model.
A) Macroscopic images of standardized periodontal defects (4 × 3 × 1 mm) without graft (no graft) and with transplantation of 12 C-MSCs at day 0. B) Representative three-dimensional μCT images of the no graft group and the 12 C-MSCs transplanted group at 4 weeks post-surgery.



Supplemental Figure 2. YAP/TAZ inhibitor II suppressed YAP/TAZ activity in Bio3D grafts without evident hCOL1 degradation. A) HE staining of Bio3D grafts (left panels) and immunofluorescence staining of human COL1 (green) with DAPI counterstaining for nuclei (blue) (right panels). Upper panels show Bio3D grafts (control), and lower panels show Bio3D grafts treated with YAP/TAZ inhibitor II. Scale bars = 500 μm. B) Immunofluorescence images of YAP/TAZ (green) and nuclei (blue) in Bio3D grafts (upper) and Bio3D grafts treated with YAP/TAZ inhibitor II (lower). Scale bars = 20 μm. C) Quantification of YAP/TAZ localization patterns, classified as predominantly nuclear (*N* > *C),* diffuse (*N* = *C*), or predominantly cytoplasmic/undetectable (*N* < *C* or undetectable). D) CTGF production in the supernatant of Bio3D grafts (control) and Bio3D grafts treated with YAP/TAZ inhibitor II. ** $p<0.01$; Welch's t-test.



Supplemental Figure 3. Successful alveolar bone regeneration by transplantation of Bio3D grafts, each derived from four different MSC lots. A) Representative μCT images, including three-dimensional reconstructed, coronal section, and transverse section views at 4 weeks post-surgery. Bio3D grafts were obtained from four MSC lots, 19TL337479, 22TL238331, 22TL290855, and 23TL058821 respectively. B) Ratio of the segmented bone volume to the total volume of the defect region at 4 weeks post-surgery. * $p<0.05$, ** $p<0.01$; one-tailed Welch's t-test.