

## Supporting Information

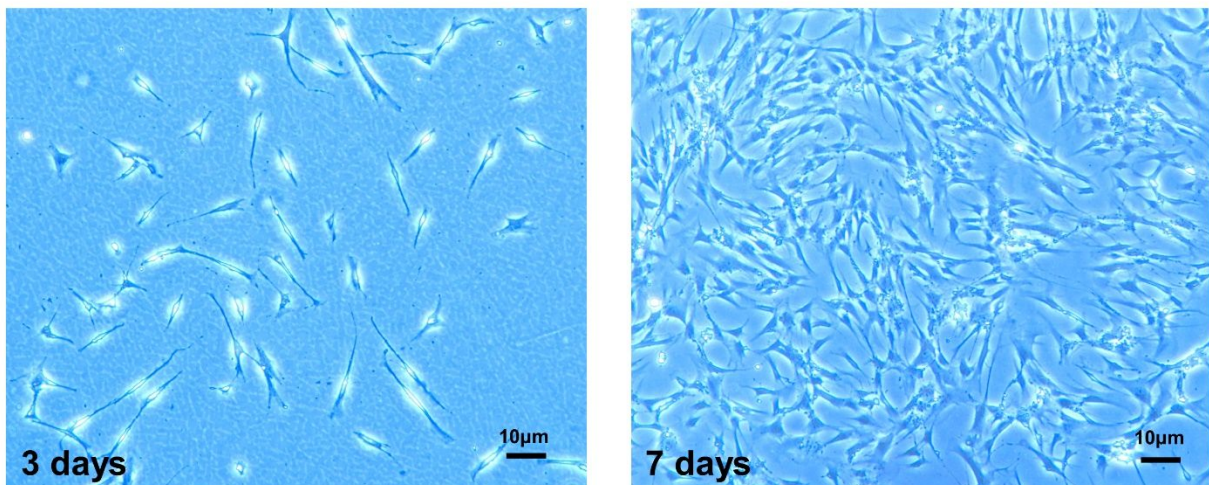
### **Biomimetic Tubular Matrix Induces Periodontal Ligament Principal Fiber Formation and Inhibits Osteogenic Differentiation of Periodontal Ligament Stem Cells**

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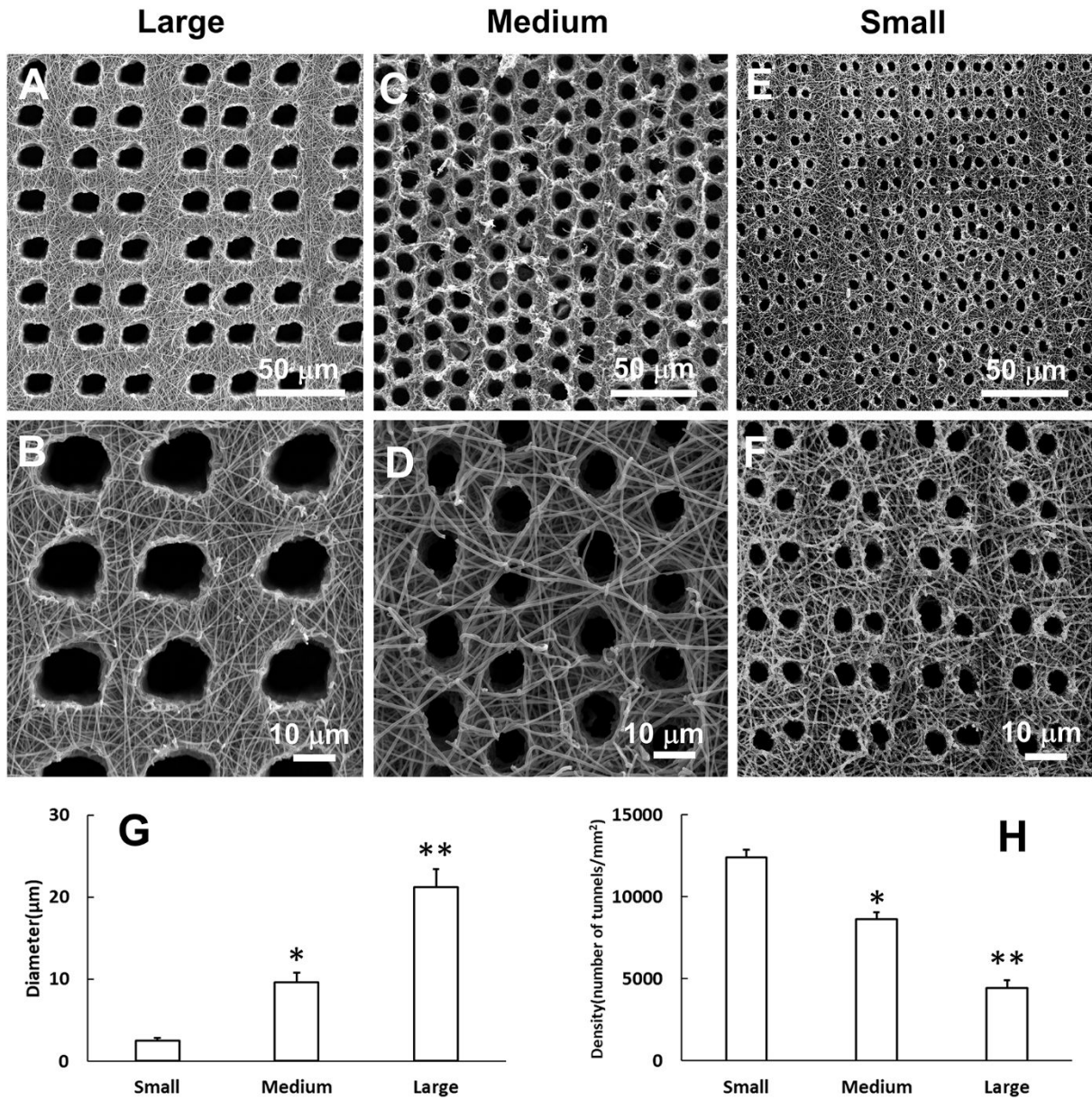
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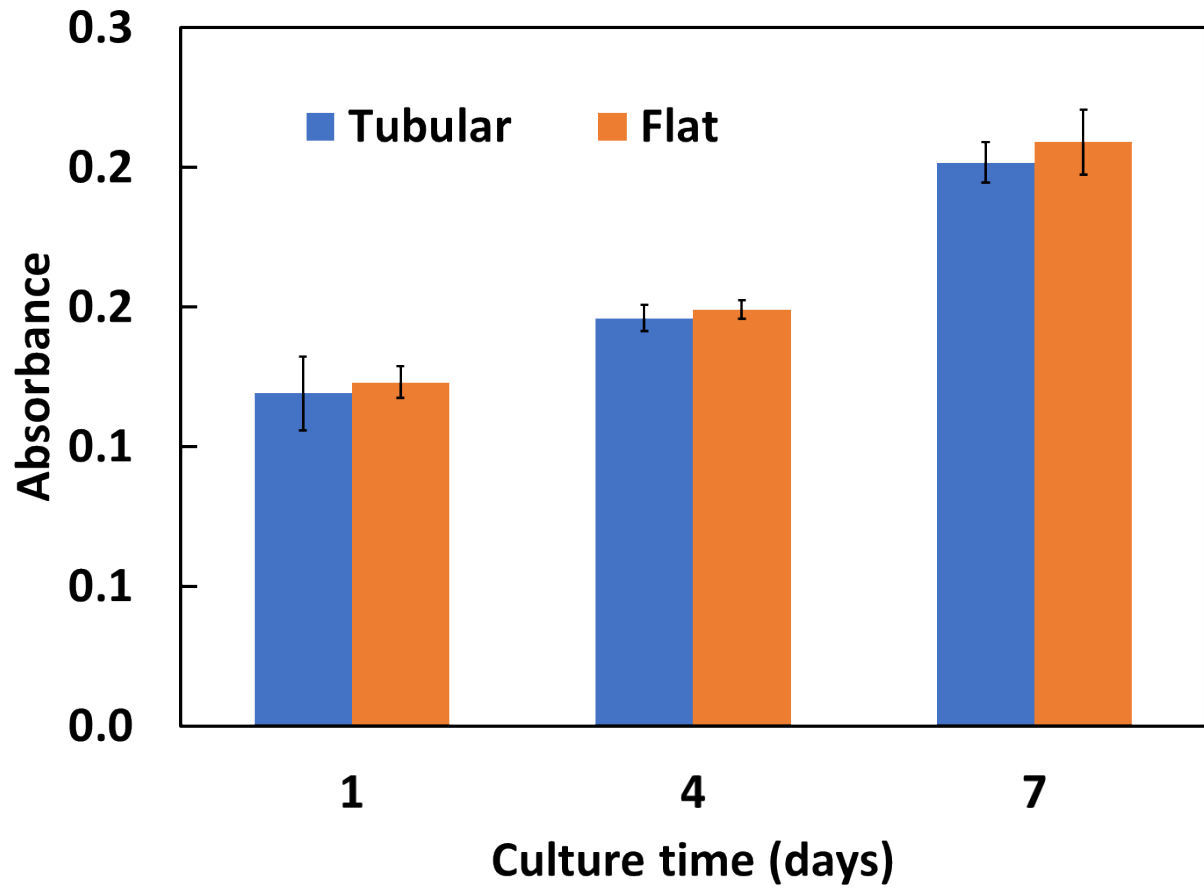
Email: [xliu1@tamu.edu](mailto:xliu1@tamu.edu)



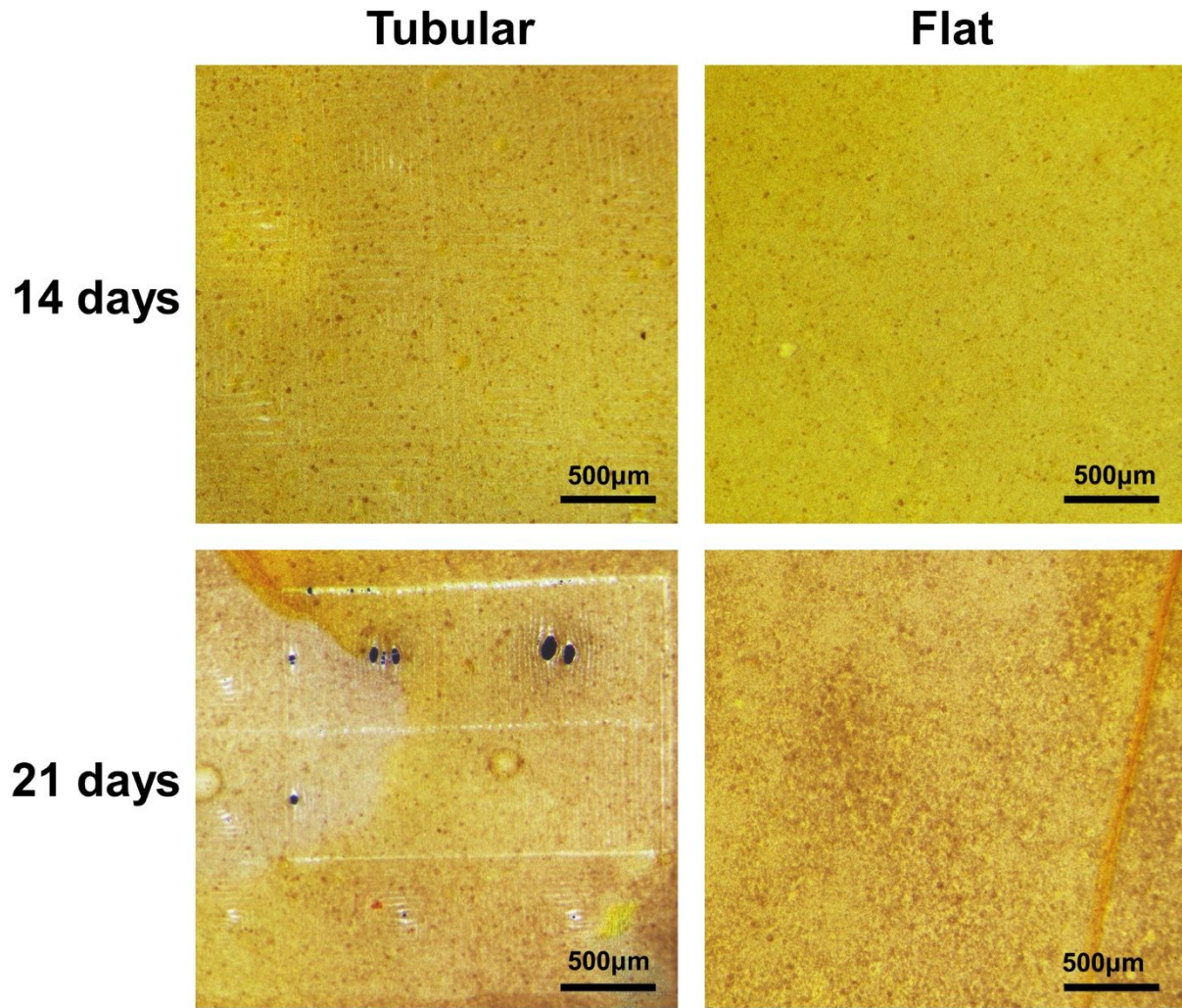
**Figure S1** Morphologies of PDLSCs cultured in petri dish after 3 and 7 days.



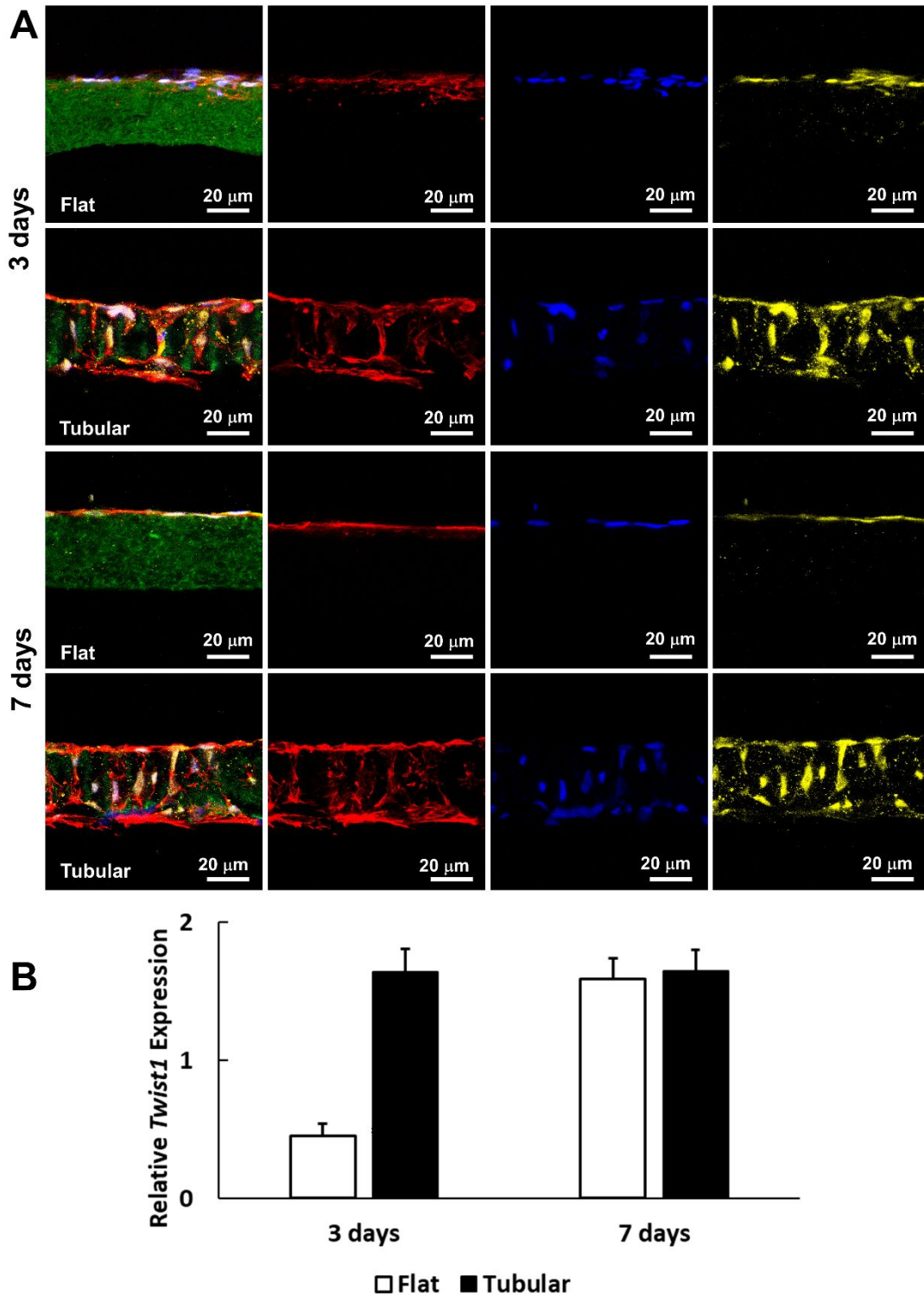
**Figure S2** Biomimetic 3D tubular gelatin matrices with different tubule diameters. Large (A-B), medium (C-D), and small (E-F). (G) Quantitative analyses of tubule diameters in the matrices. (H) Quantitative analyses of tubule densities in the matrices.  $P < 0.05$  was considered statistically significant. \* compared to the small group and \*\* compared to the medium group.



**Figure S3** Proliferation of PDLSCs cultured on 3D nanofibrous tubular and flat matrices for 7 days.



**Figure S4** Alizarin Staining of the PDLSCs/scaffold constructs after cultured for 14 and 21 days.



**Figure S5** TWIST1 expressions on the tubular and flat matrices on day 3 and day 7. (A) Immunofluorescence of PDLSCs on the tubular and flat matrices. Green: gelatin matrix. Red: actin. Blue: DAPI. Yellow: TWIST1. (B) The relative Twist1 gene expressions of PDLSCs on the tubular and flat matrices on day 3 and day 7.  $P < 0.05$  was considered statistically significant. \* compared to the tubular group.