Supplementary Information

Polydopamine-mediated Covalent Functionalization of Collagen on Titanium Alloy to Promote Biocompatibility with Soft Tissues

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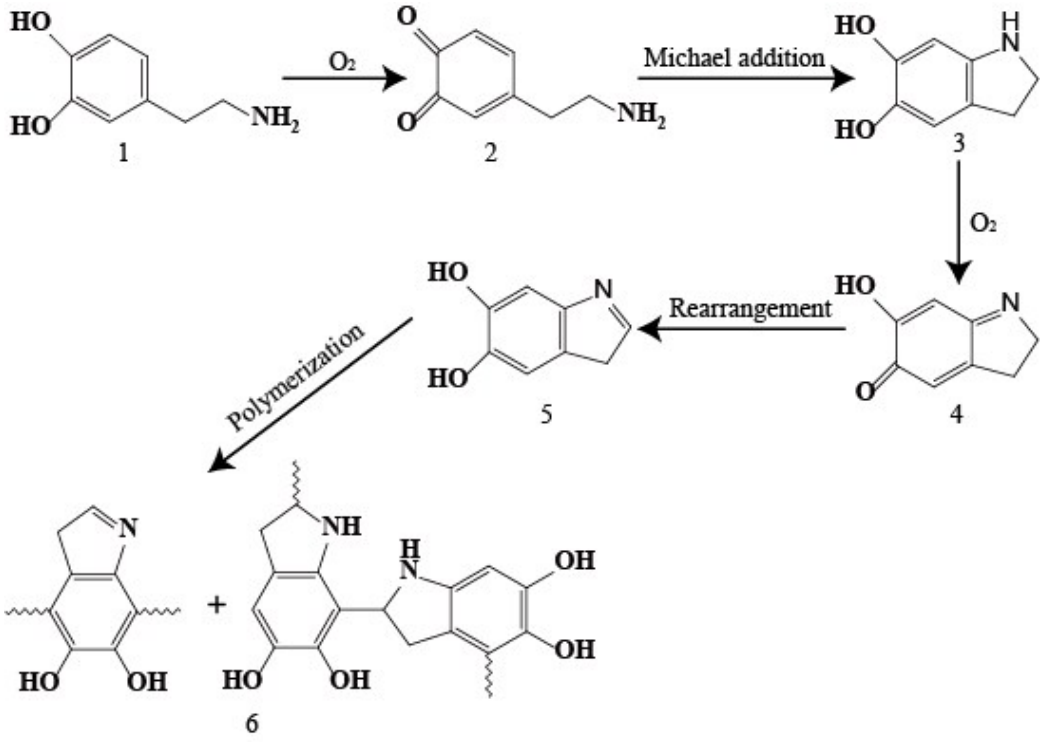


Fig. S1 The mechanism of dopamine polymerization.

Table S1 Percentage of atomic composition for indicated sample surfaces based on XPS survey spectra.

	C/%	N/%	O/%	Ti/%
Ti (control)	49.6	1.9	36.4	8.7
Ti-PDA	50.5	6.5	20.5	1.5
Ti-PDA-Col	64.6	12.6	21.7	1.1
Ti-PDA-Col 7-day	65.8	11.8	21.2	1.2
Ti-Col	65.3	9.1	21.8	1.2
Ti-Col 7-day	55.4	4.2	33.2	7.2

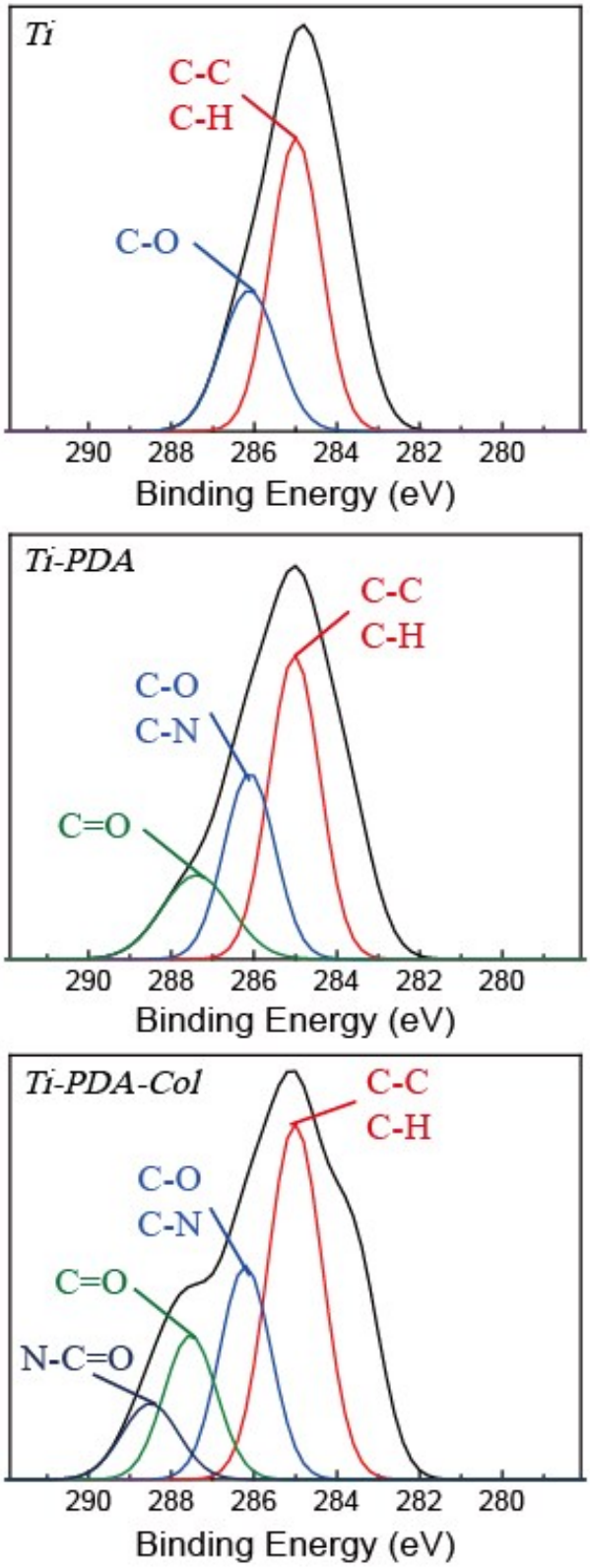


Fig. S2 Characterization of surface chemical structure: XPS high resolution spectra of C_{1s} for indicated sample surfaces.

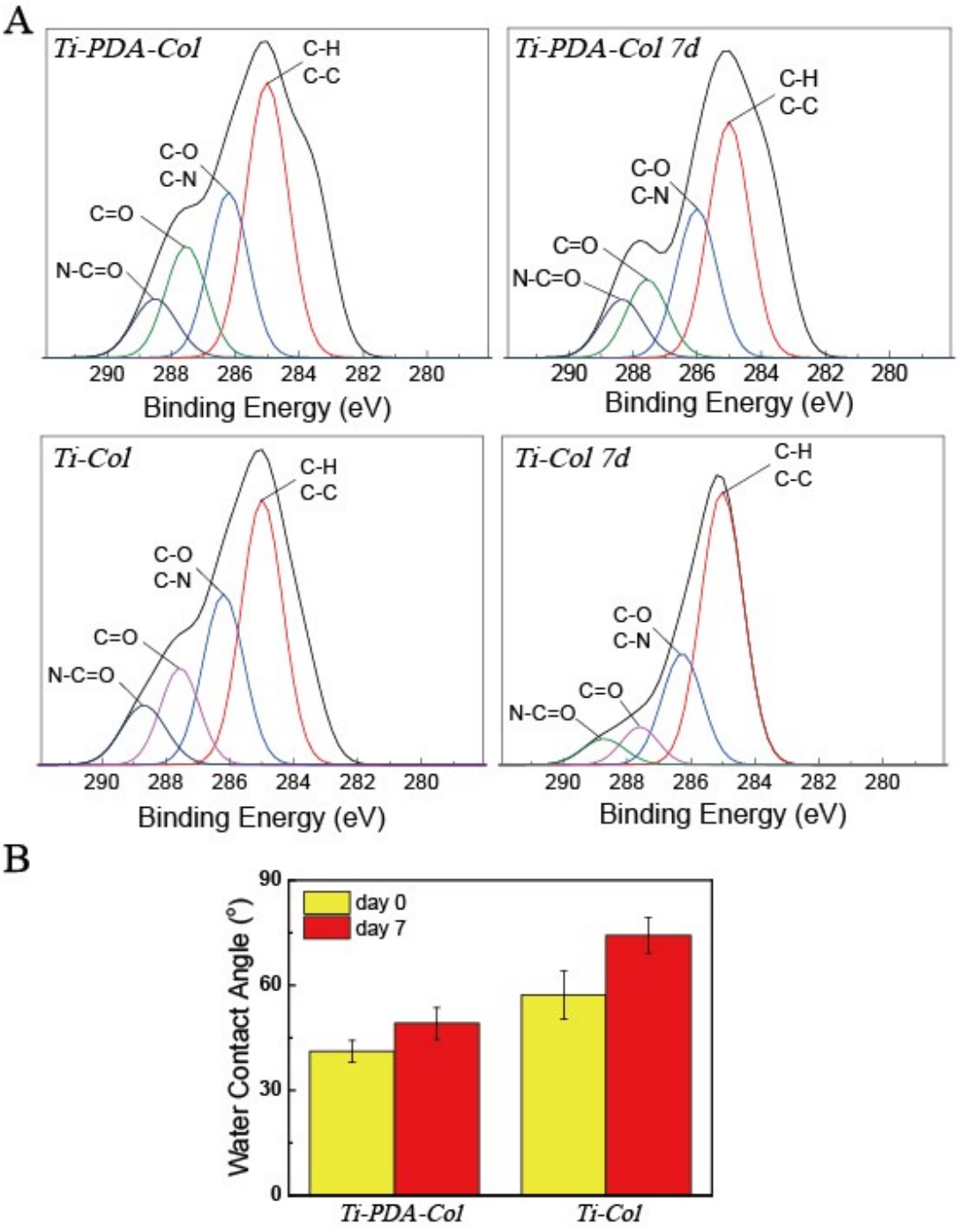
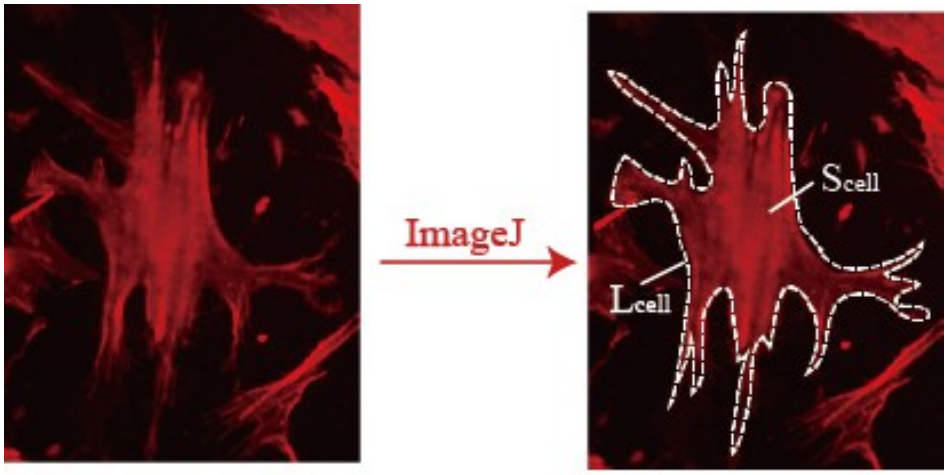


Fig. S3 (A) The XPS high resolution spectra of C_{1s} and (B) static water contact angle for Ti-PDA-Col and Ti-Col surfaces before and after being immersed in PBS buffer for seven days.



$$\mathrm{SI} = \frac{4\pi S}{L^2}$$

Fig. S4 A schematic illustration of the way to semi-quantify the perimeter (*L*) and spreading area (*S*) of stained cells with ImageJ and the calculation formula of shape index (SI).

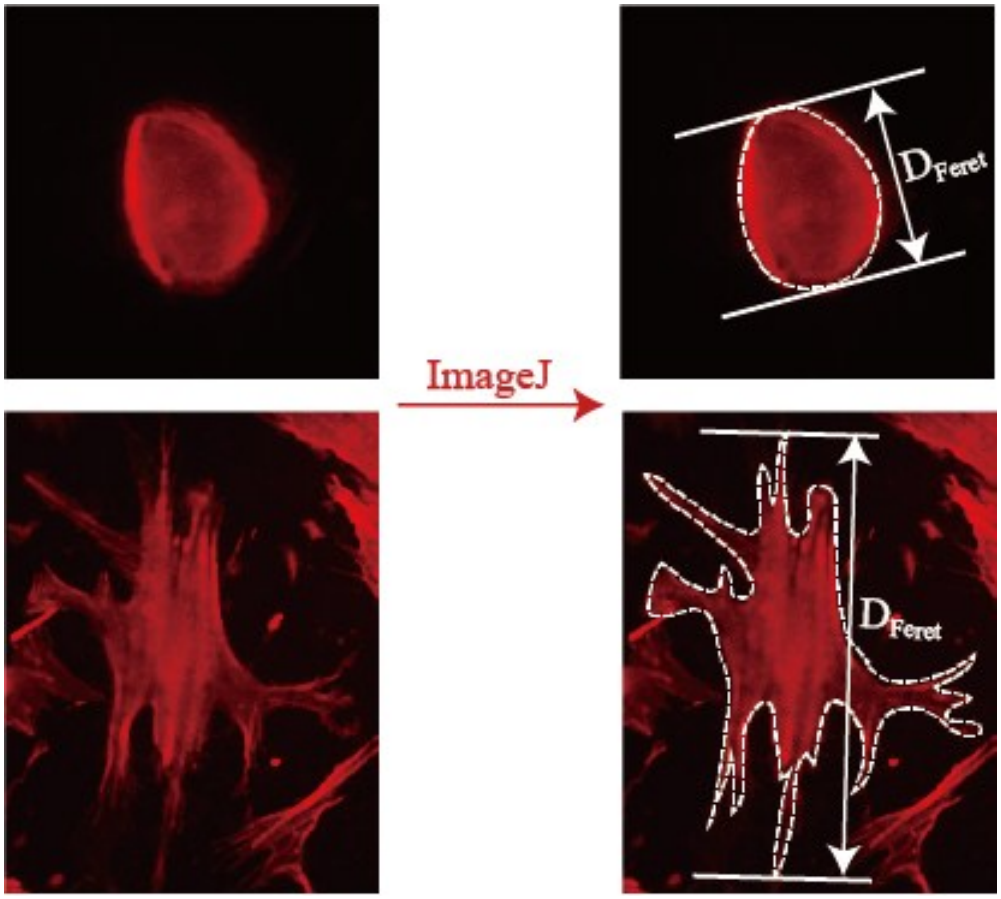


Fig. S5 A schematic illustration of the way to semi-quantify the Feret diameter (D_{Feret}) of stained cells with ImageJ. One can obviously see the difference in D_{Feret} of a cell owing to the development of filopodia and lamellipodia.

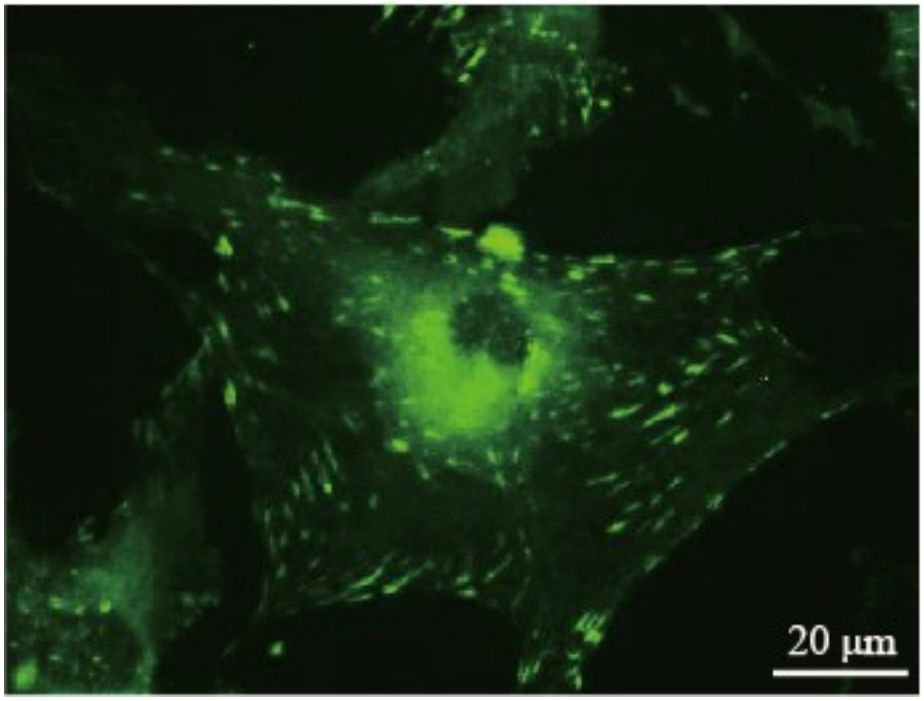


Fig. S6 Fluorescence micrograph of human foreskin fibroblast (HFF) cells after 1 day of culture on the Ti-PDA-Col surface. Clear focal adhesion plaques can be seen from the morphology of HFF's vinculin.

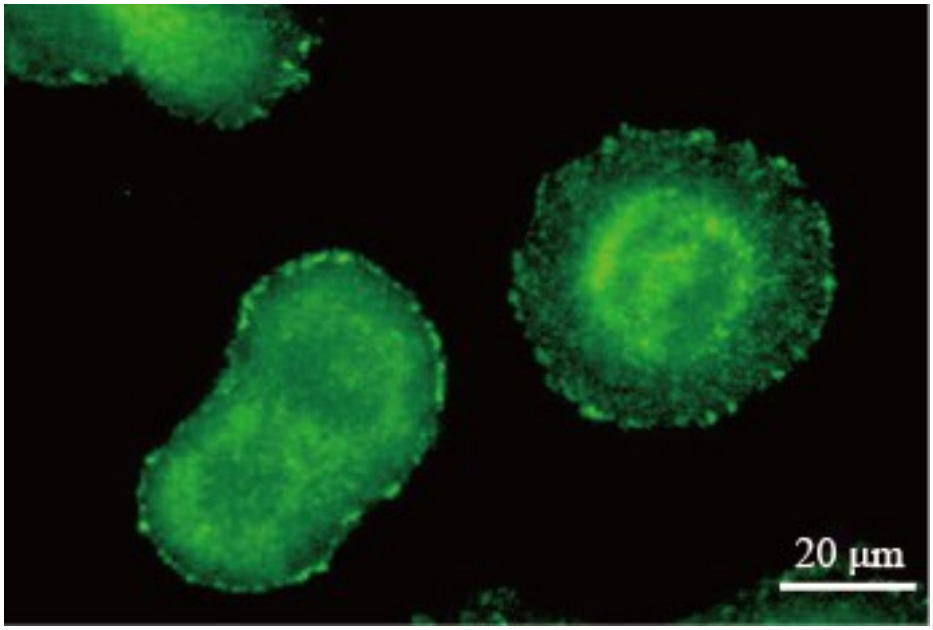


Fig. S7 Fluorescence micrograph of human immortal keratinocyte (HaCaT) cells after 1 day of culture on Ti-PDA-Col surface. We can see the clear focal adhesion plaques from the morphology of HaCaT's vinculin.

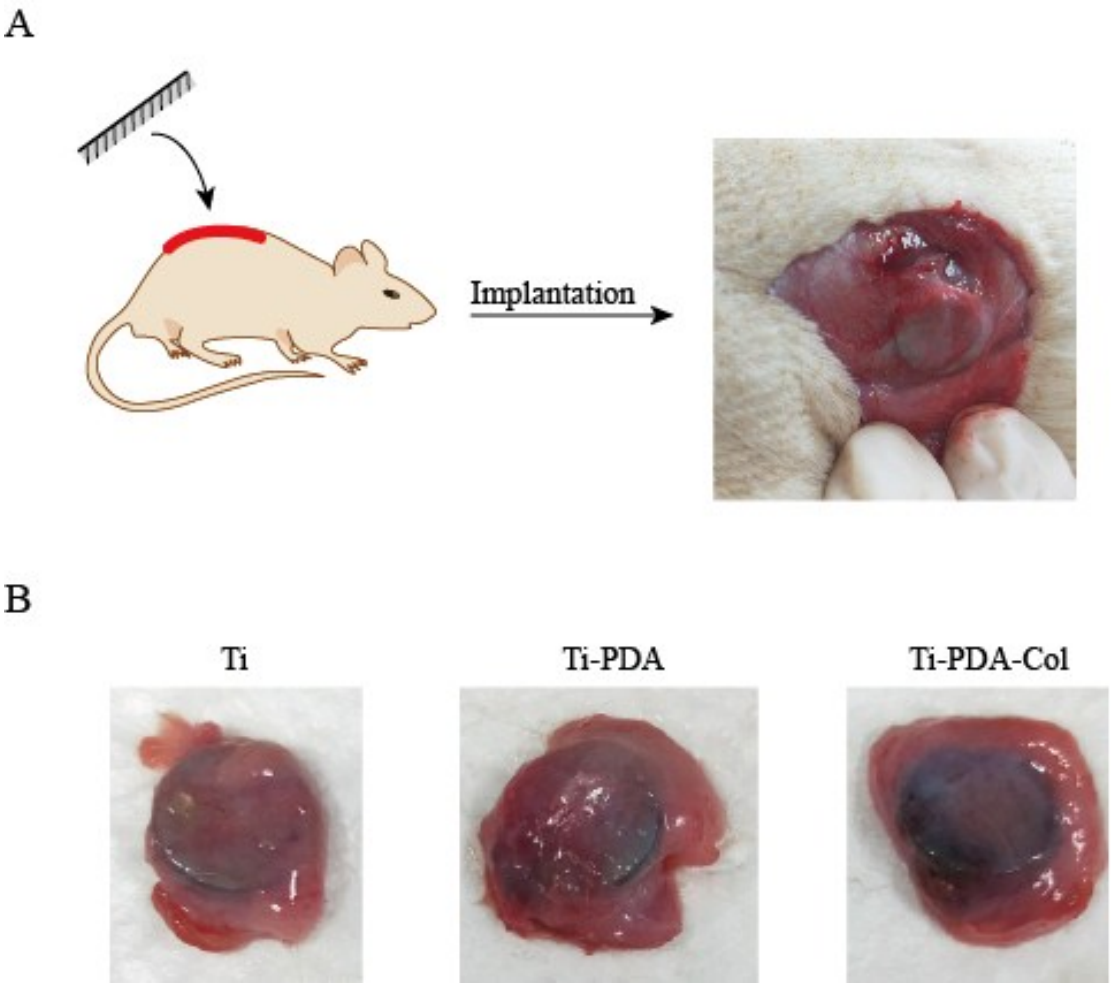


Fig. S8 (A) Schematic presentation of in vivo tests (left) and the photograph of the implantation region. (B) The global observations of the indicated different samples surrounded by soft tissue after 30 days of implantation.