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Supporting Information

for

Colloidal few layered graphene–tannic acid preserves the biocompatibility of periodontal ligament cells

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Additional figures and tables

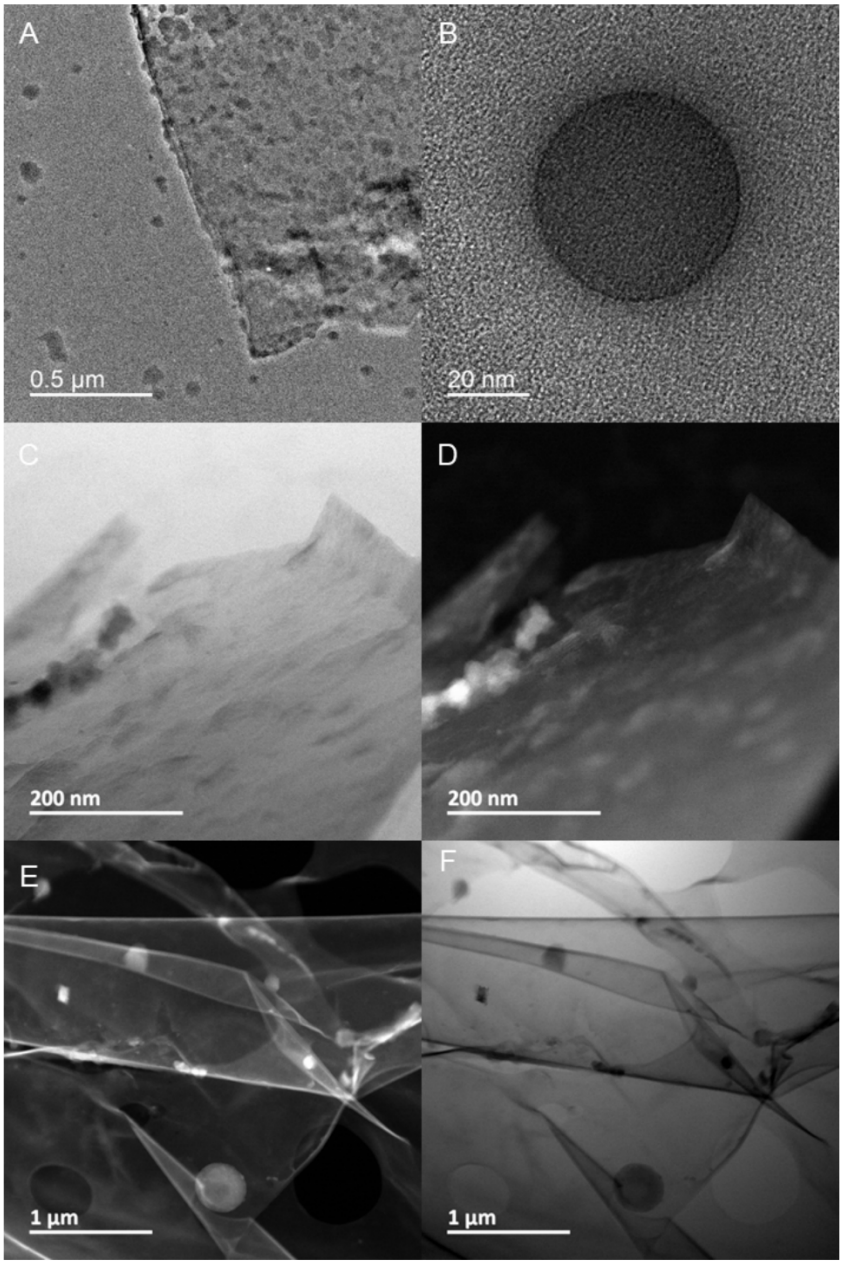

Figure S1: Representative transmission electron microscopy (TEM) micrographs of FLG layers obtained after liquid-phase exfoliation of graphite assisted by TA (A). Structure of spherical granules present on top of layers (B). BF-STEM (C, F) and DF-STEM (D, E) images of FLG sheets and particle distribution on the surface. BF: bright field; DF:dark field.

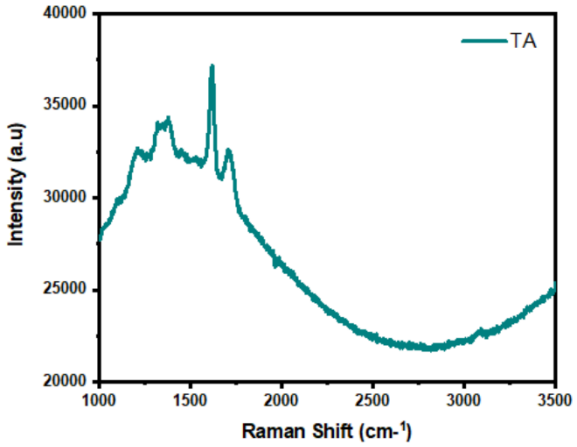

Figure S2: Raman spectrum of tannic acid.

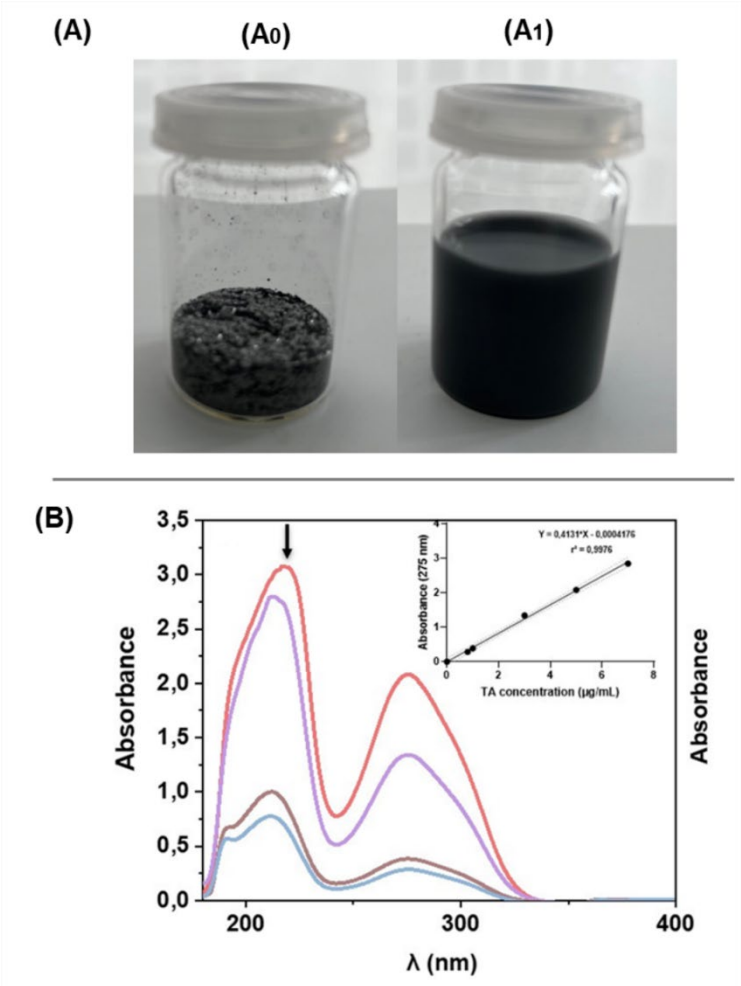

Figure S3: Picture of the initial graphite (A0) and FLG–TA colloid after ultrasonication and sedimentation (A1). UV–visible spectra of TA with different concentrations (0–8 µg·mL^{-1}) in the wavelength range of 180–400 nm. The inset represents the linear calibration curve between the concentrations of TA and the absorbance at 274 nm (B).

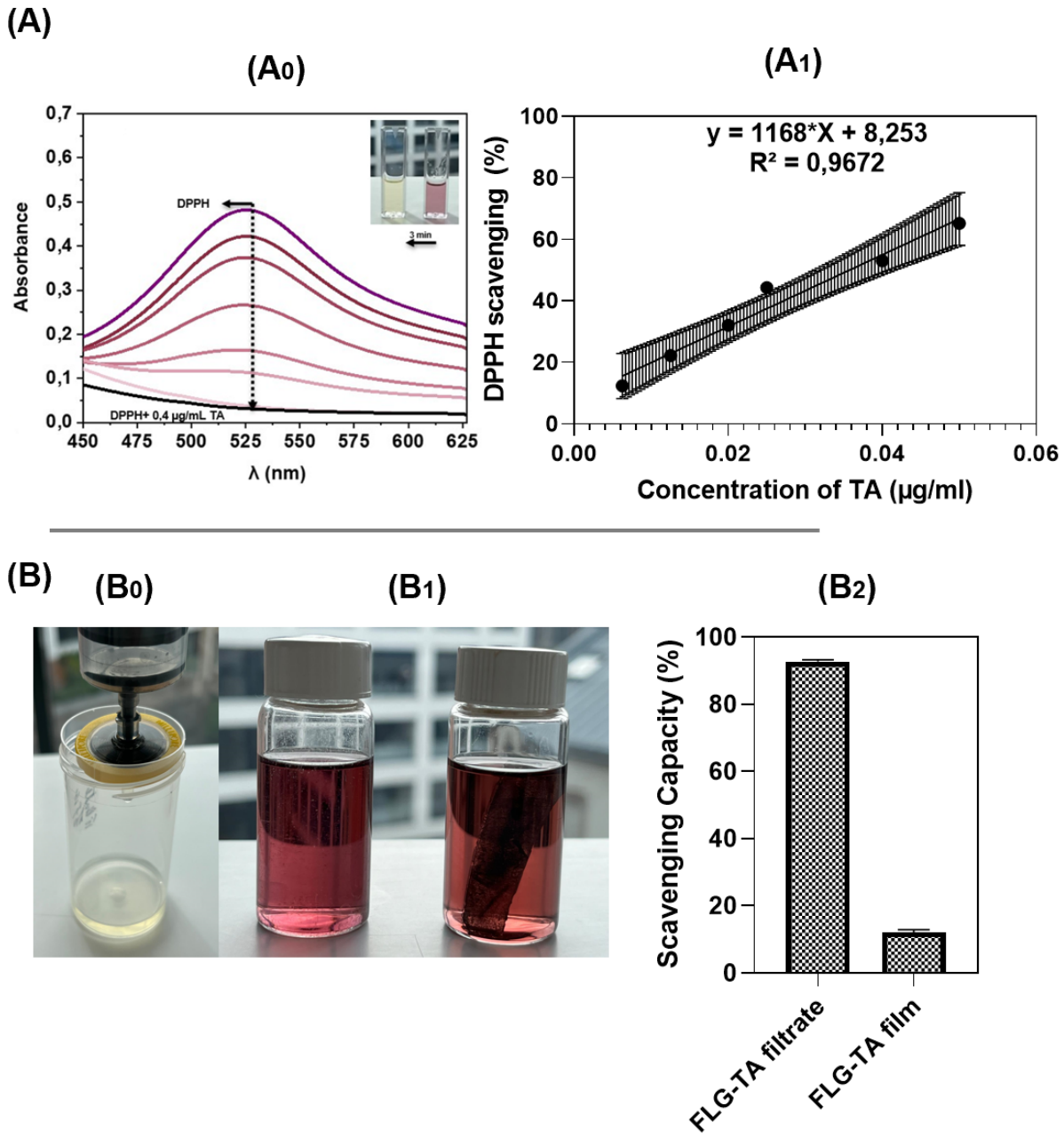

Figure S4: Determination of TA's ability to scavenge stable DPPH free radicals by monitoring the intensity of the DPPH radical absorption peak at 517 nm (A0). Calibration curve between TA concentrations ($\mu g \cdot mL^{-1}$) and respective DPPH scavenging capacity (%) at 517 nm (A1). Pictures showing the DPPH scavenging capacity of FLG–TA filtrate (B0) and FLG–TA film (B1), and their respective experimental DPPH scavenging capacities (%) (B2).

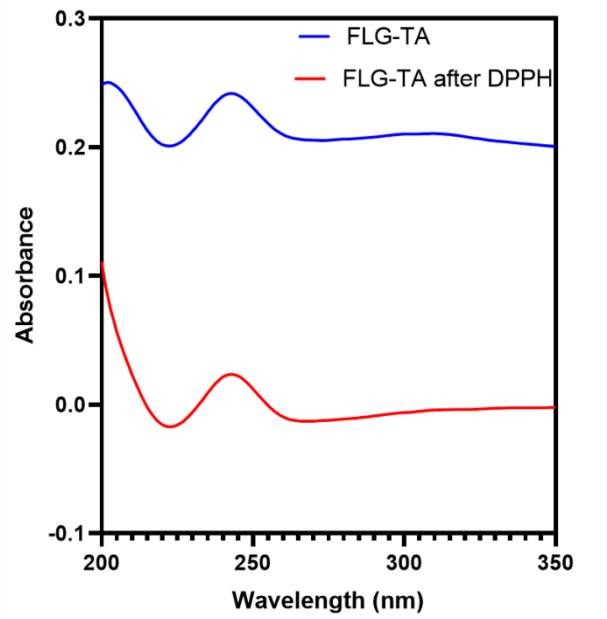

Figure S5: UV–visible absorption spectra of FLG–TA films before and after exposure to DPPH radical solution (10^{-4} M, 30 min incubation), demonstrating changes in material stability under oxidative conditions.

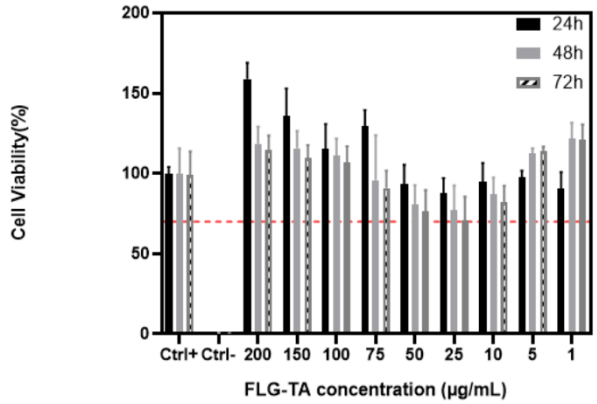

Figure S6: Cell viability assessment of PDL cells exposed to FLG–TA. Alamar Blue assay was performed at 24, 48, and 72 h timepoints. Data are presented as mean ± SD (*n* = 3), normalized to positive control.

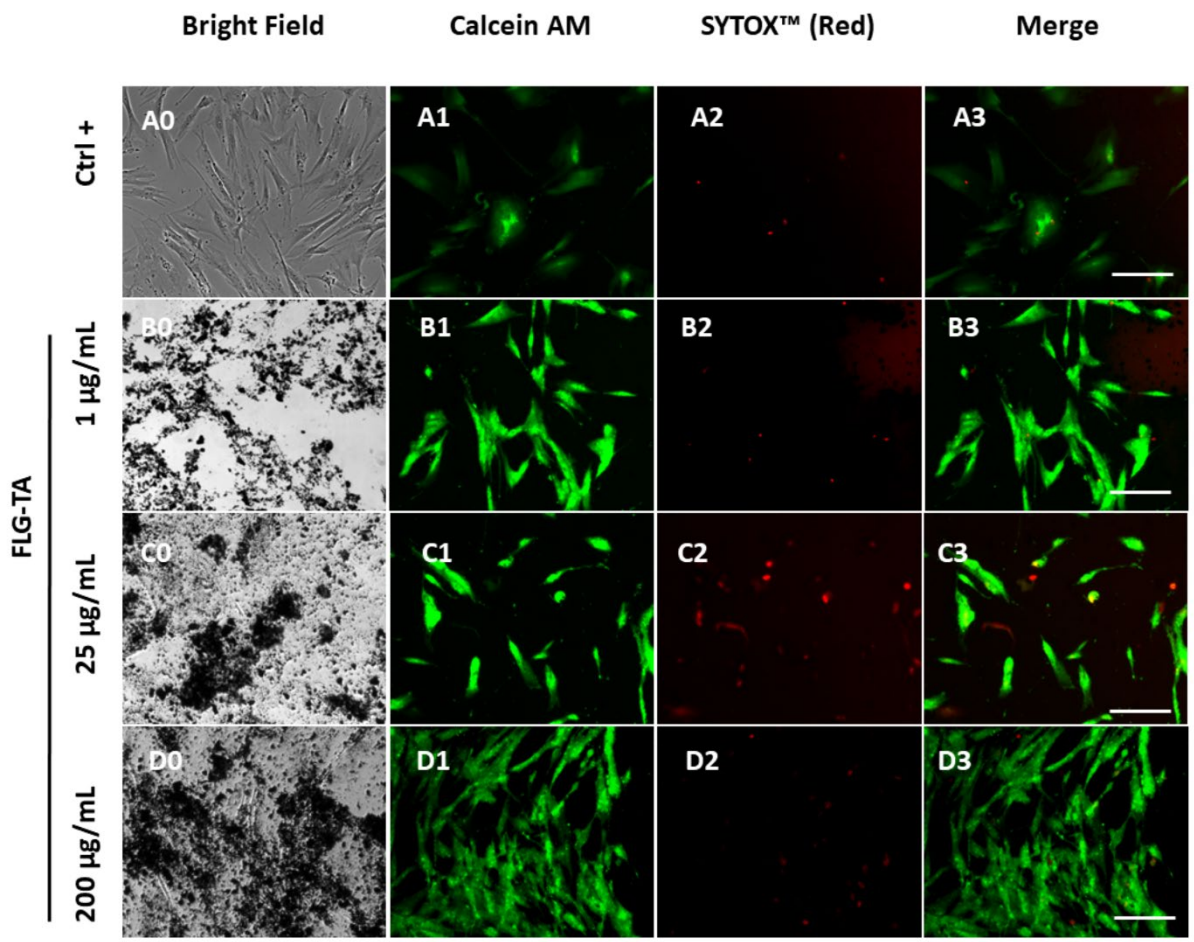

Figure S7: Representative fluorescence microscopy images showing cell viability assessment using LIVE/DEAD assay. Live cells exhibit green fluorescence (Calcein AM, ex/em: 495/515 nm) while dead cells show deep red fluorescence (SYTOX™ Deep Red, ex/em: 660/682 nm). Scale bar: 60 µm.

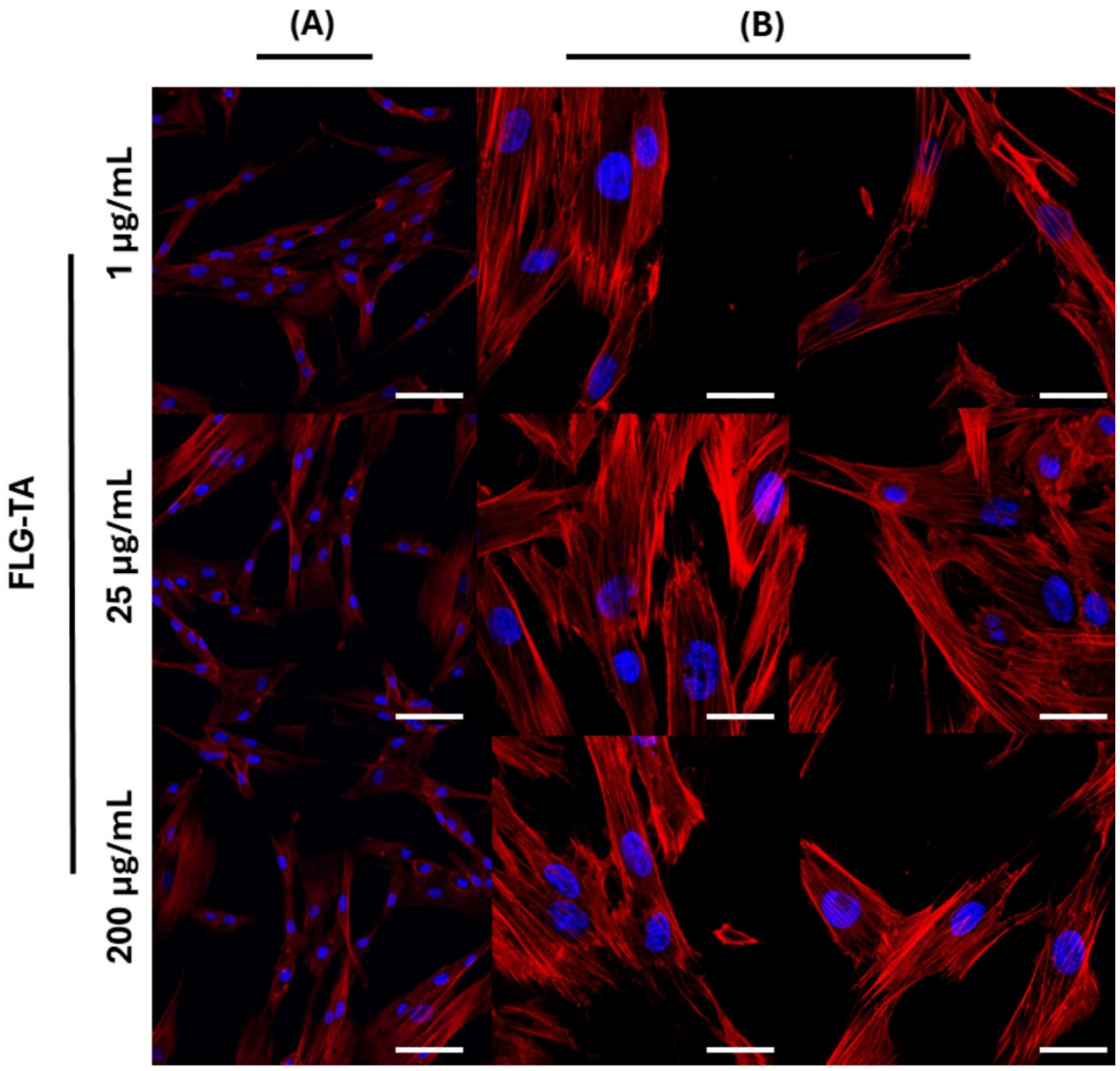

Figure S8: Additional representative merged confocal images of PDL cells exposed to FLG–TA at 1, 25, and 200 µg·mL^{-1}, showing phalloidin-stained F-actin (red) and Hoechst 33258-stained DNA (blue). (A) Low magnification, scale bar: 60 µm and (B) higher magnification, scale bar: 20 µm.

Table S1: XPS data of graphite and FLG–TA including the contribution of different carbon moieties obtained by deconvolution of C 1s, and O-to-C ratio obtained from the area of O 1s and C 1s peaks.

Sample	XPS analysis (atom %)					O 1s/C 1s
	C–C, C=C	C–OR/defects	C=O	COOR	π–π*	
Graphite	80.98	7.31	4.74	3.32	3.66	0.17
FLG–TA	73.06	13.06	5.94	3.75	4.06	0.45