

Supplementary Materials

Guiding Stem Cell Differentiation and Proliferation Activities Based on Nanometer-Thick Functionalized Poly-*p*-xylylene Coatings

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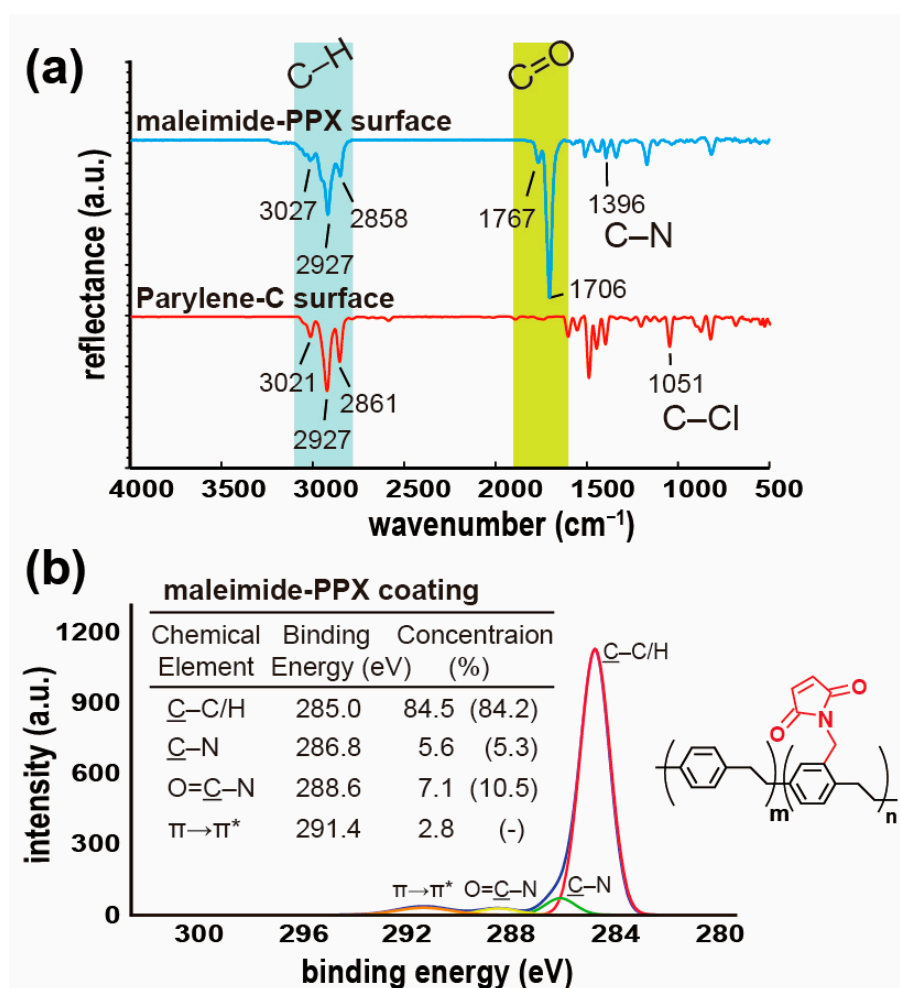


Figure S1. Maleimide-functionalized poly-p-xylylene (maleimide-PPX) coating. **(a)** Infrared reflection-absorption spectroscopy (IRRAS) spectra for the maleimide-PPX coating. The peaks located at 1396 cm^{-1} (C-N), 1706 and 1767 cm^{-1} (C=O) correspond to the characteristic band stretches for the maleimide groups. Infrared reflection absorption spectroscopy (IRRAS) spectra for the Parylene-C coating which has no maleimide was also shown for the better comparison. **(b)** X-ray photoelectron spectroscopy (XPS) characterization of the maleimide-PPX coating. The table compares the experimental values of the XPS survey high-resolution C1 s spectra with the theoretical predictions. The signal at 285.0 eV is attributed to the aliphatic and aromatic carbons (C-C, C-H), and the intensity at 84.5 at\% compares well with the theoretical concentration of 84.2 at\% . The C-N bond was detected with 5.6 at\% , which compares well with the theoretical value of 5.3 at\% . The peak at 288.6 eV was assigned to the O=C-N group of the maleimide (7.1 at\%) and agrees with the theoretical value of 10.5 at\% . The signal at 291.4 eV (2.8 at\%) indicates $\pi \rightarrow \pi^*$ transitions.

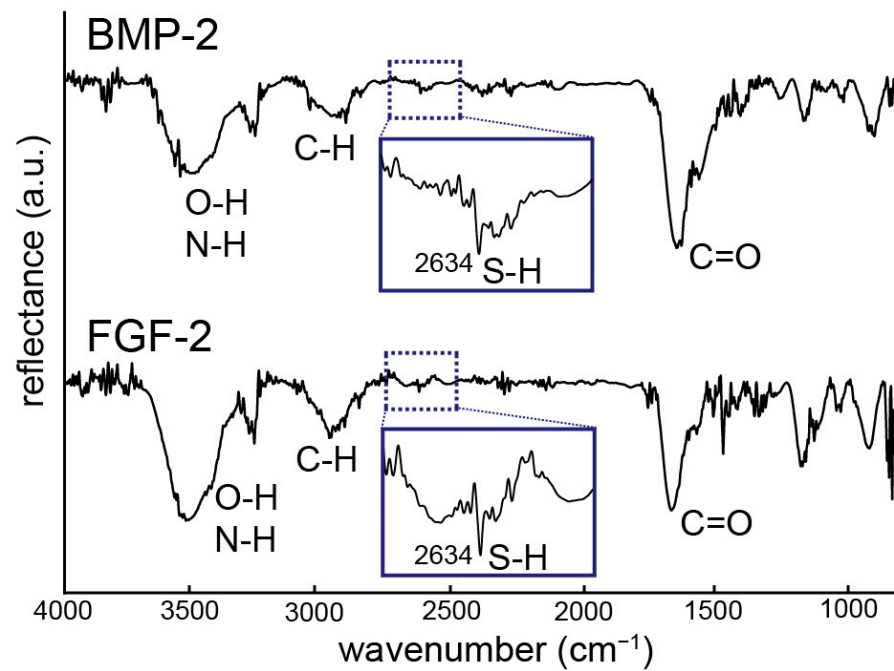


Figure S2. FT-IR spectra of BMP-2 (bone morphogenetic protein 2) and FGF-2 (fibroblast growth factor 2) alone. The thiol groups of the BMP-2 and FGF-2 proteins (i.e., S-H band at 2634 cm^{-1}) in the spectra were highlighted.

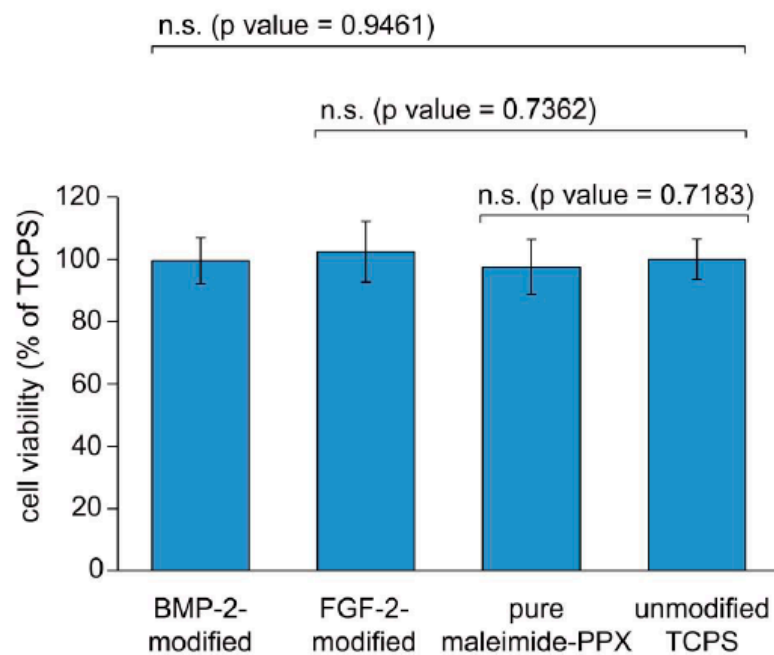


Figure S3. Biocompatibility analysis of the maleimide-PPX coatings. The human adipose-derived stem cells (hADSCs) were cultured on each surface for 1 day and the cell viabilities were then quantified by using a 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. The data bars represent the mean value and the standard deviation (\pm SD) based on three independent samples. The p-value large than 0.05 indicates the studied surface has a good biocompatibility with no significant difference (n.s.) as compared to the unmodified TCPS surfaces.