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A Facile Approach to Surface Modification on Versatile Substrates for Biological Applications

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Figure S1. XPS survey spectra of Ti surface before and after modification. (A) The bare Ti surface; (B) PEAC-modified surface; PEAC-modified Ti further modified by (C) MPA, (D) MPD, (E) DDT and (F) GSH through thiol-ene photochemical reactions.

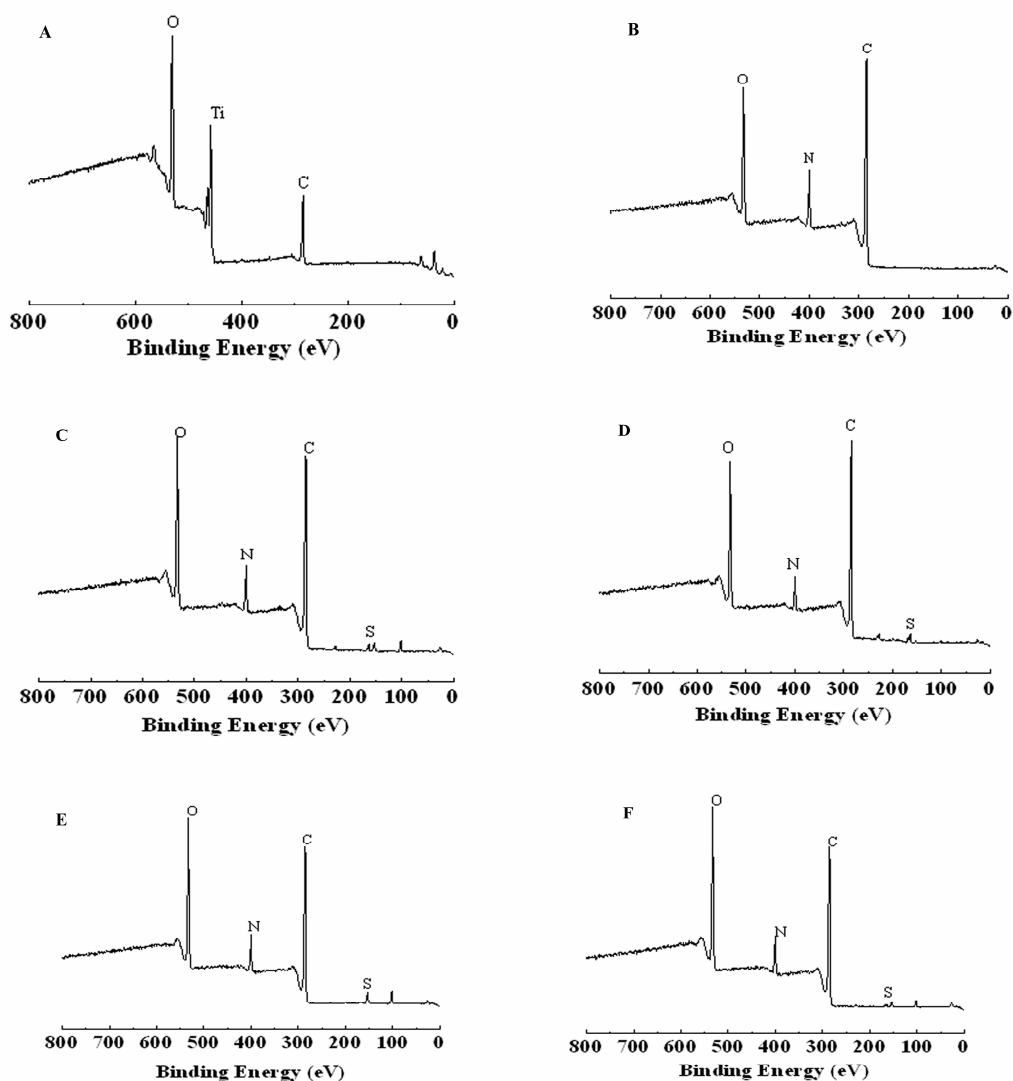


Figure S2. High-resolution C (1s) XPS spectra of Ti surface before and after modification. (A) The bare Ti surface; (B) PEAC-modified surface; PEAC-modified Ti further modified by (C) MPA, (D) MPD, (E) DDT and (F) GSH through thiol-ene photochemical reactions.

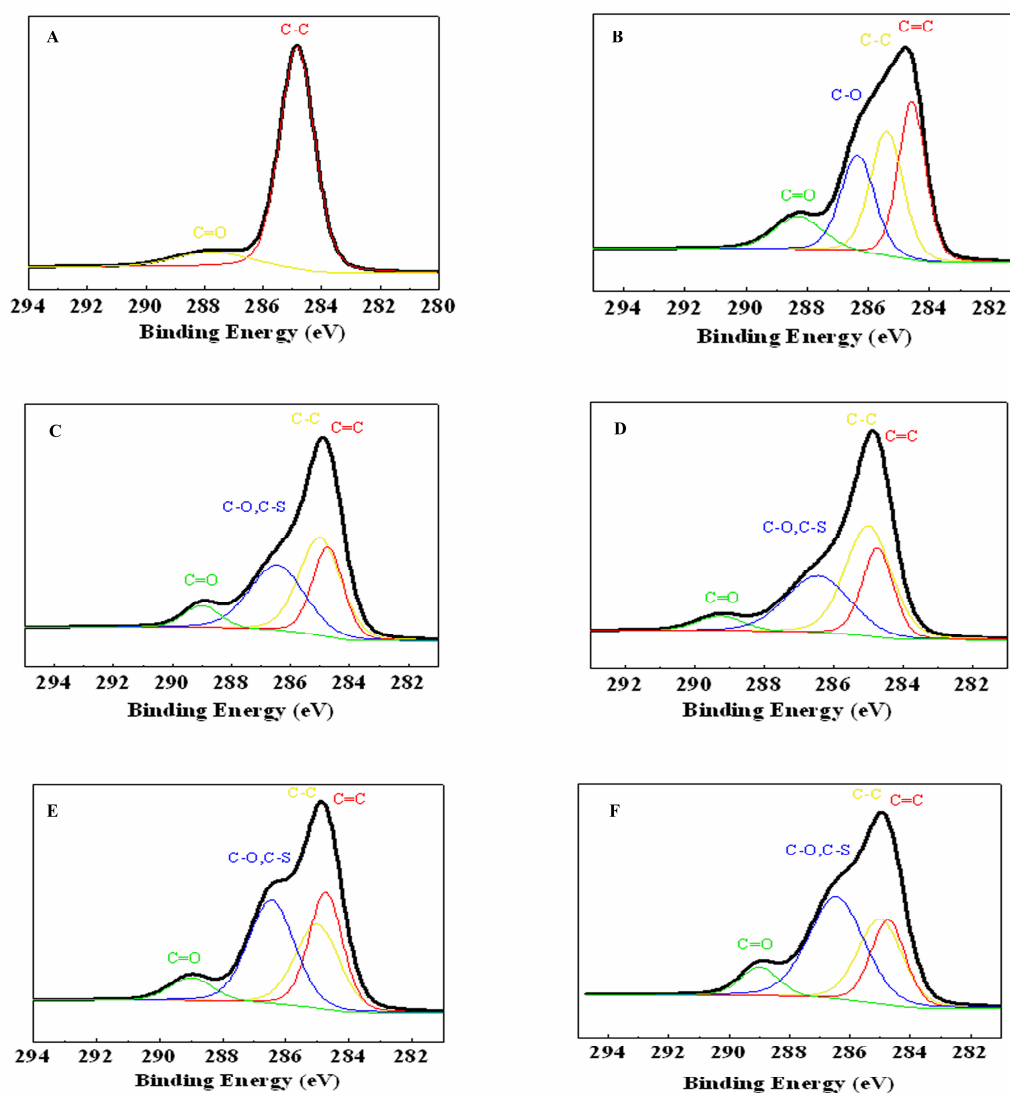


Figure S3. High-resolution N (1s) XPS spectra of Ti surface after modification. (A) PEAC-modified Ti; PEAC-modified Ti further modified by (B) MPA, (C) MPD, (D) DDT and (E) GSH through thiol-ene photochemical reactions.

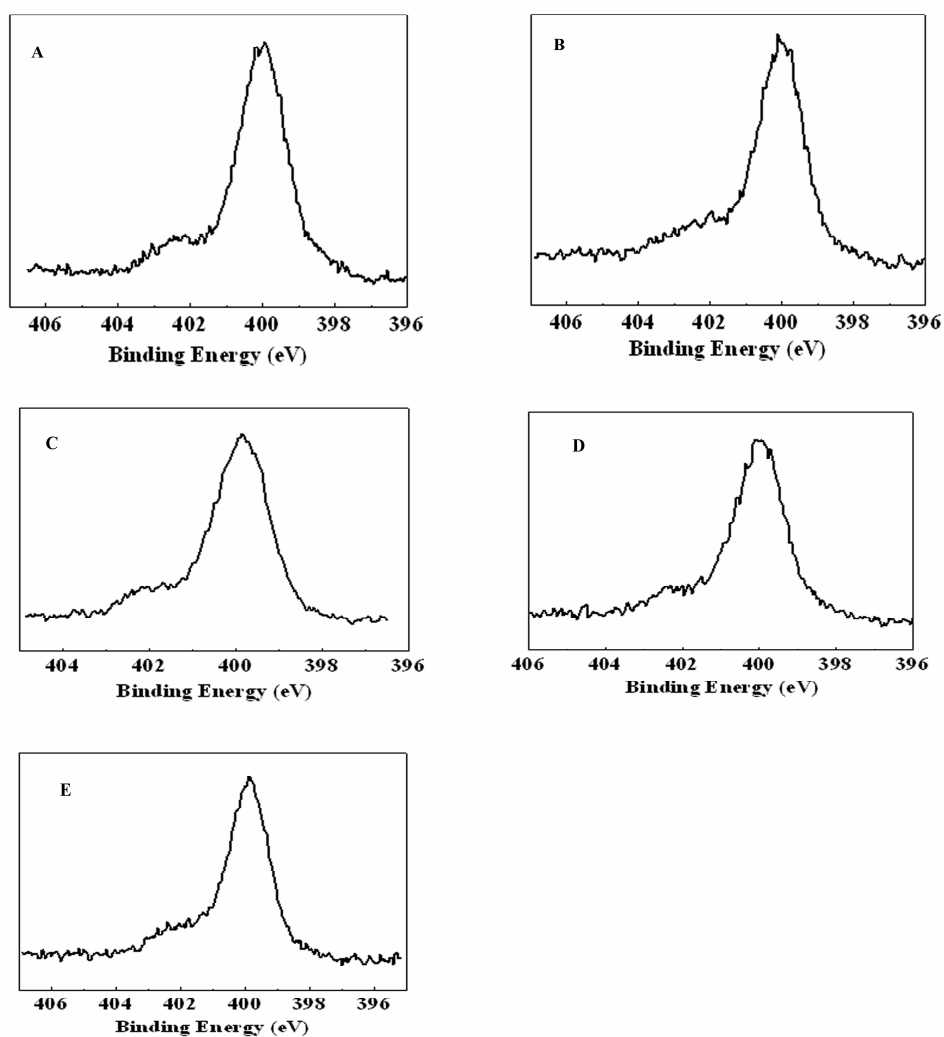


Figure S4. High-resolution S(2p) XPS spectra of PEAC-modified Ti further modified by (A) MPA, (B) MPD, (C) DDT and (D) GSH thiol-ene photochemical reactions.

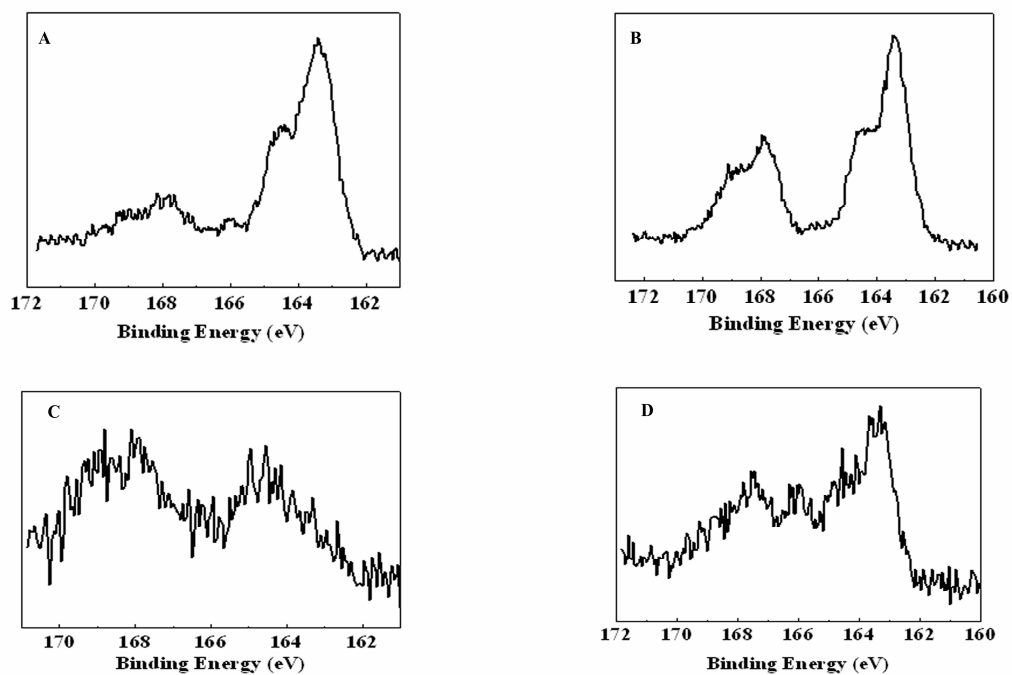


Figure S5. XPS survey spectra of glass surface before and after modification. (A) The bare glass surface; (B) PEAC-modified surface; PEAC-modified glass further modified by (C) MPA, (D) MPD, (E) DDT and (F) GSH through thiol-ene photochemical reactions.

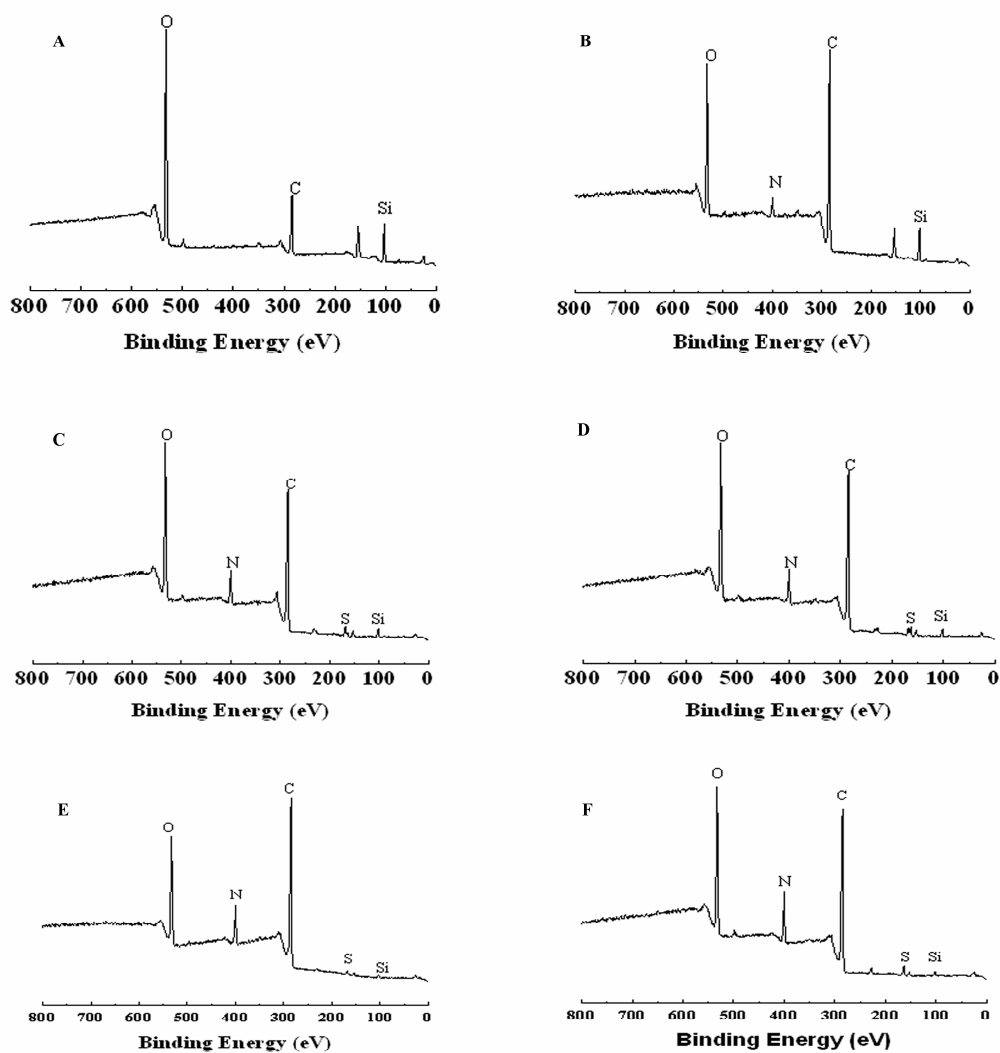


Figure S6. High-resolution C (1s) XPS spectra of glass surface before and after modification. (A) The bare glass surface; (B) PEAC-modified surface; PEAC-modified glass further modified by (C) MPA, (D) MPD, (E) DDT and (F) GSH through thiol-ene photochemical reactions.

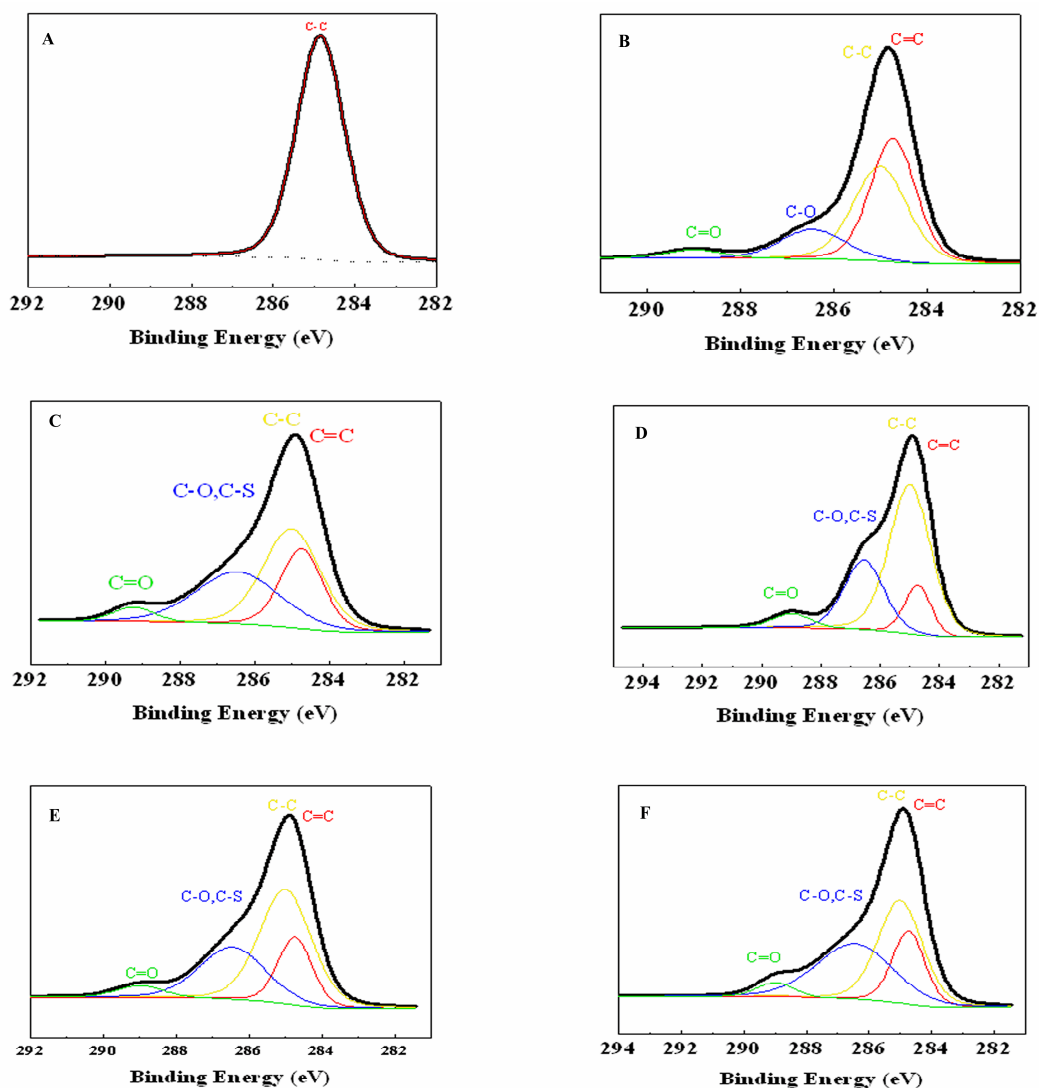


Figure S7. High-resolution N (1s) XPS spectra of glass surface after modification. (A) PEAC-modified glass; PEAC-modified glass further modified by (B) MPA, (C) MPD, (D) DDT and (E) GSH through thiol-ene photochemical reactions.

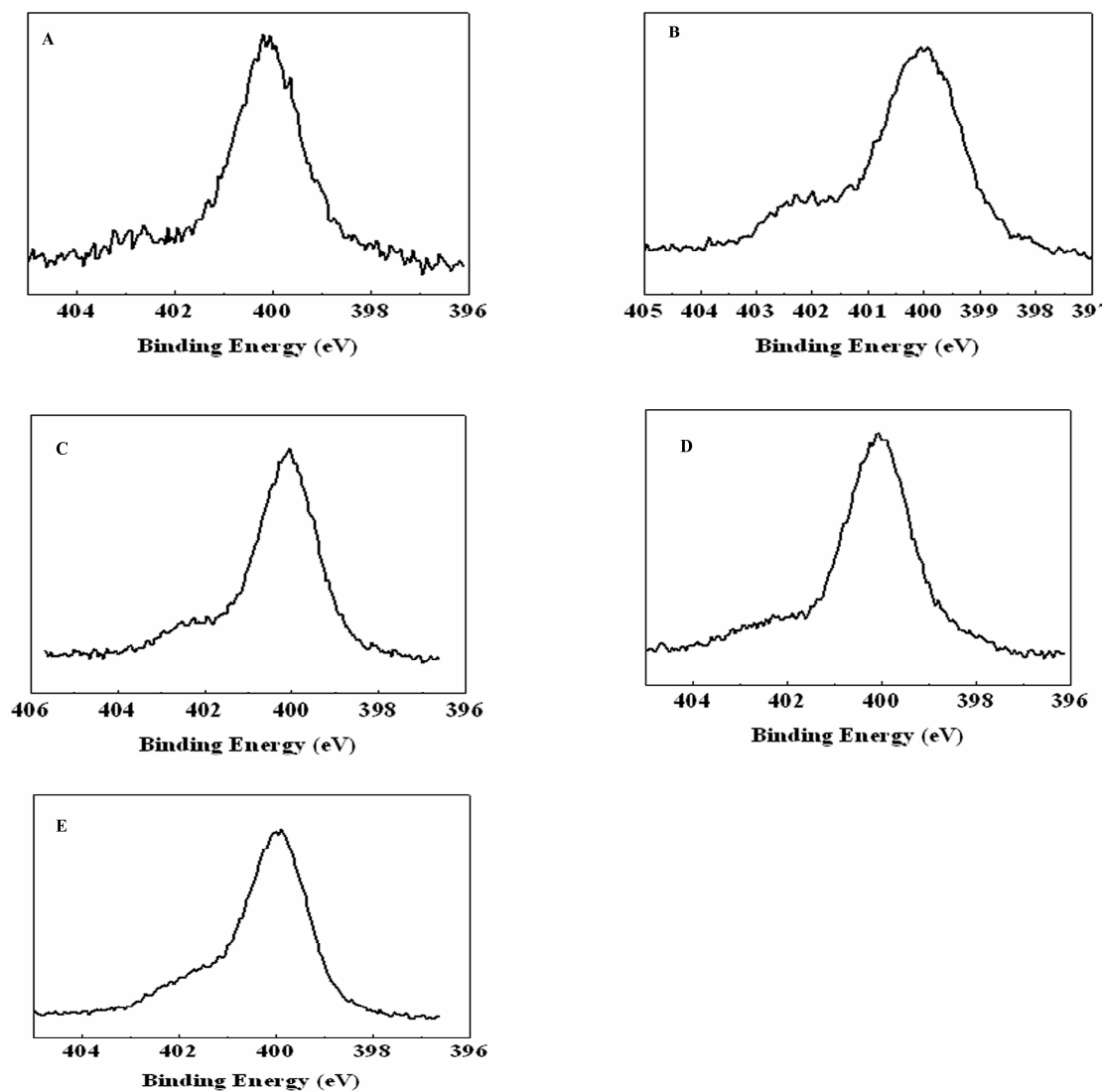


Figure S8. High-resolution S(2p) XPS spectra of PEAC-modified glass further modified by (A) MPA, (B) MPD, (C) DDT and (D) GSH thiol-ene photochemical reactions.

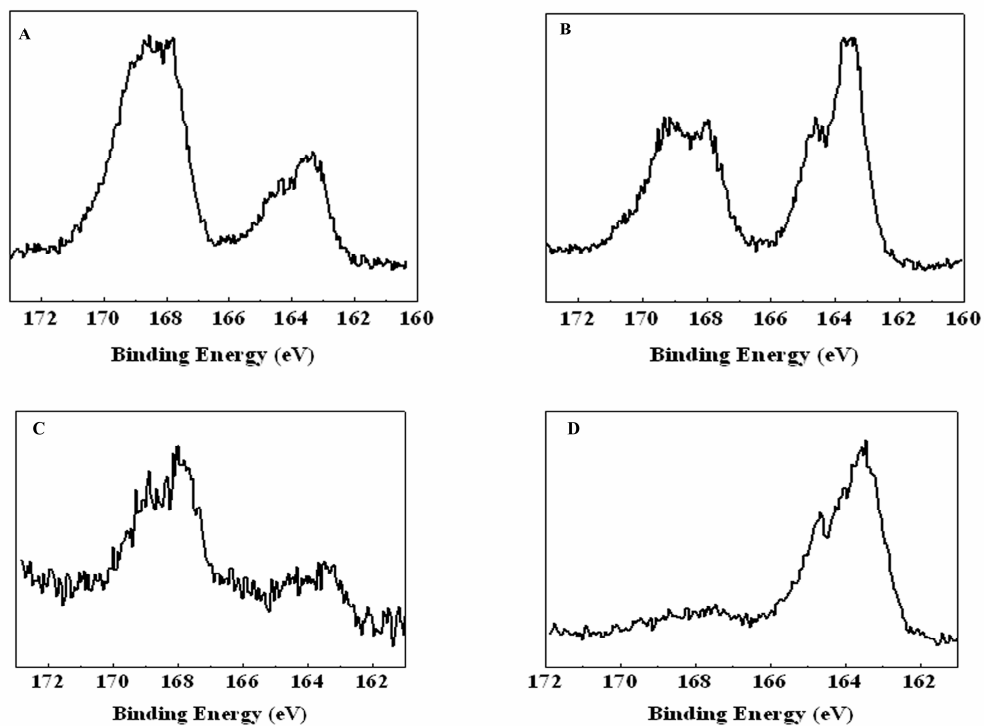


Figure S9. XPS survey spectra of PEAC-modified PTFE further modified by (A) MPD, (B) DDT, and (C) GSH through thiol-ene photochemical reactions.

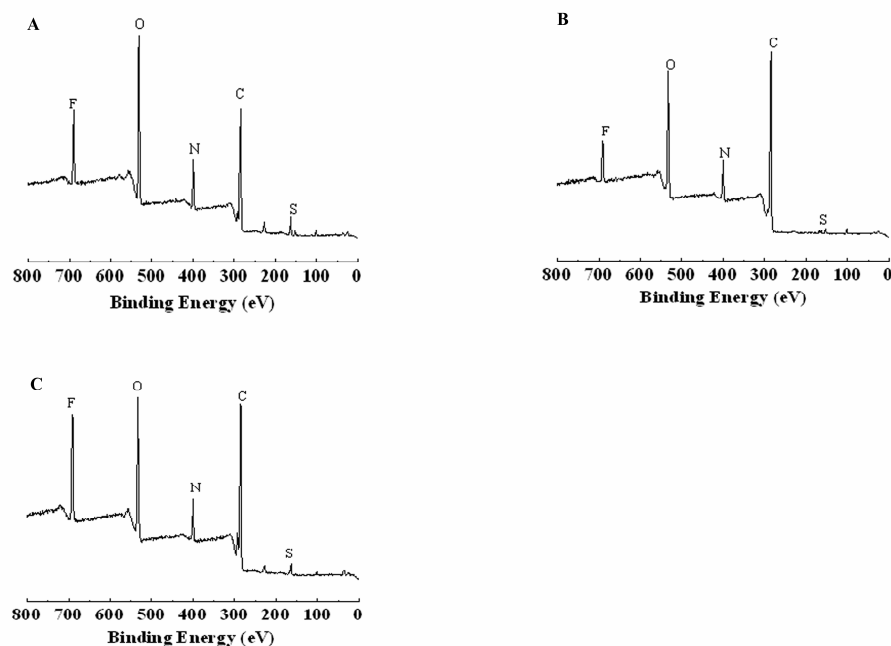


Figure S10. High-resolution C (1s) XPS spectra of PEAC-modified PTFE further modified by (A) MPD, (B) DDT, and (C) GSH through thiol-ene photochemical reactions.

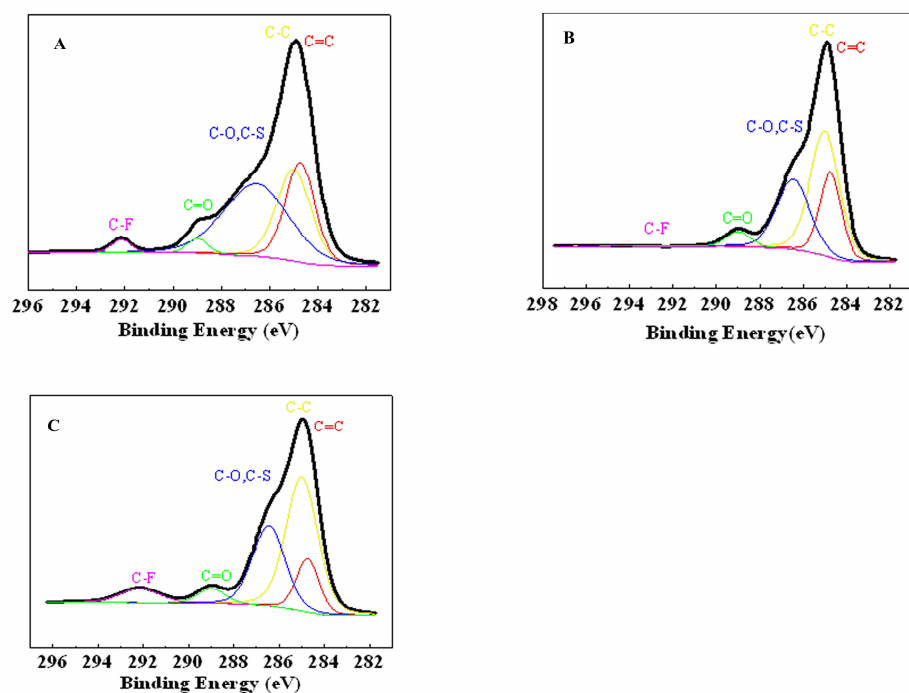


Figure S11. High-resolution N (1s) XPS spectra of PTFE surface treated by PEAC (A), and further modified by (B) MPA, (C) MPD, (D) DDT and (E) GSH through thiol-ene photochemical reactions.

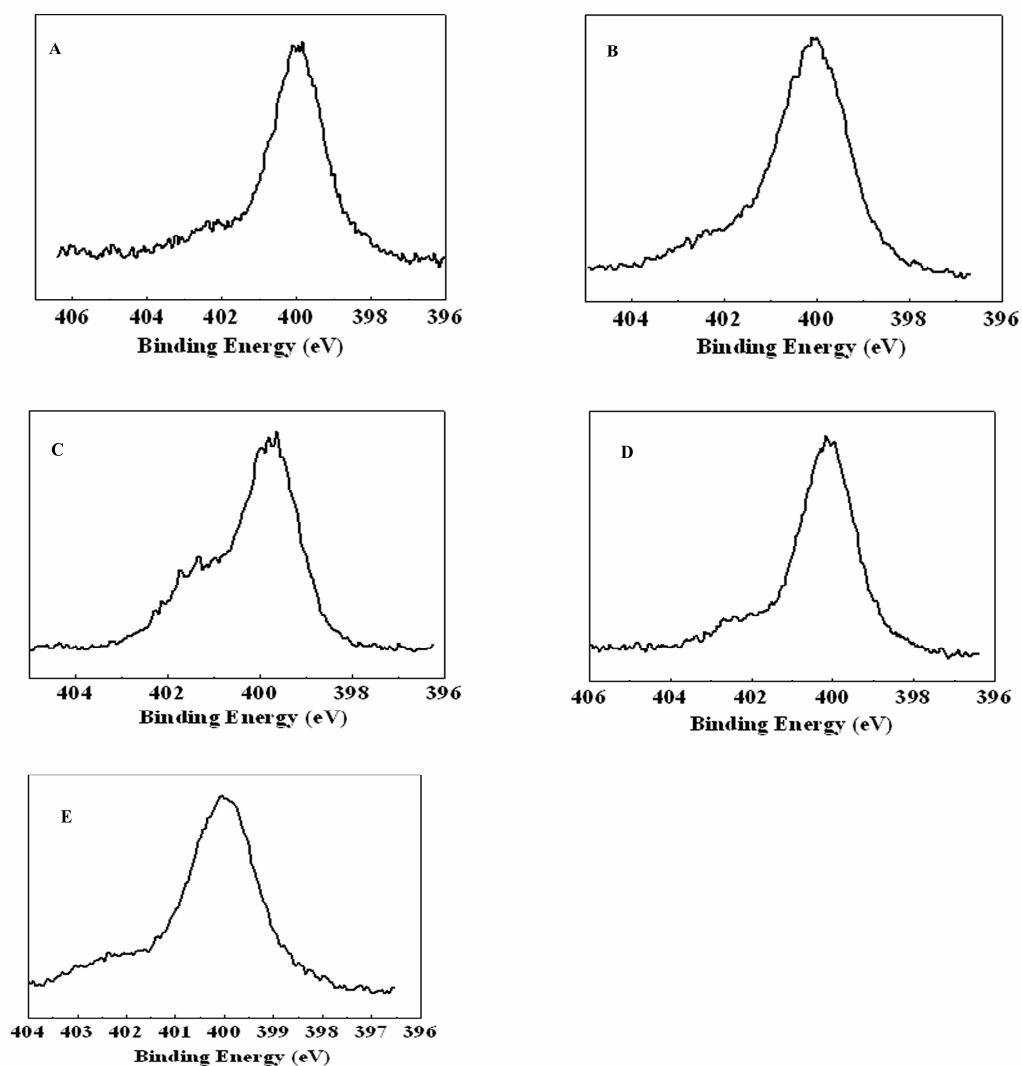


Figure S12. High-resolution S (2p) XPS spectra of PEAC-modified PTFE modified by (A) MPA, (B) MPD, (C) DDT and (D) GSH through thiol-ene photochemical reactions.

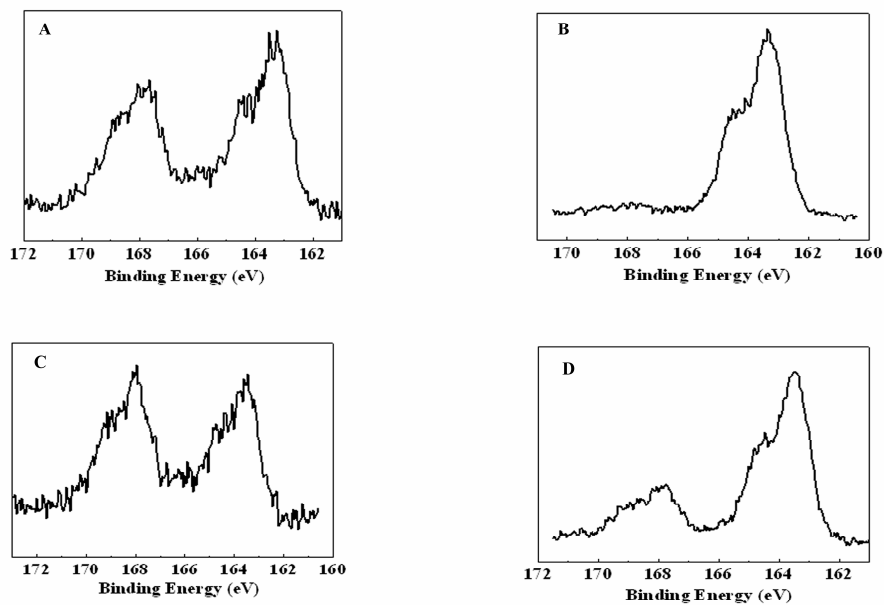


Figure S13. The optical image of DDT immobilized onto the PEAC-modified surface with regular growth patterns. For producing such patterns, a 400 mesh (37 μm hole, 25 μm bar) copper grid was used as a photomask. A few drops of a freshly prepared solution of DDT (30 mM) and Irgacure 651 (15mM) in absolute ethanol were spread on the PEAC-modified surface directly contacted with a TEM grid and irradiated with UV light for 5 minutes. The grid was then removed and the sample was washed with ethanol.

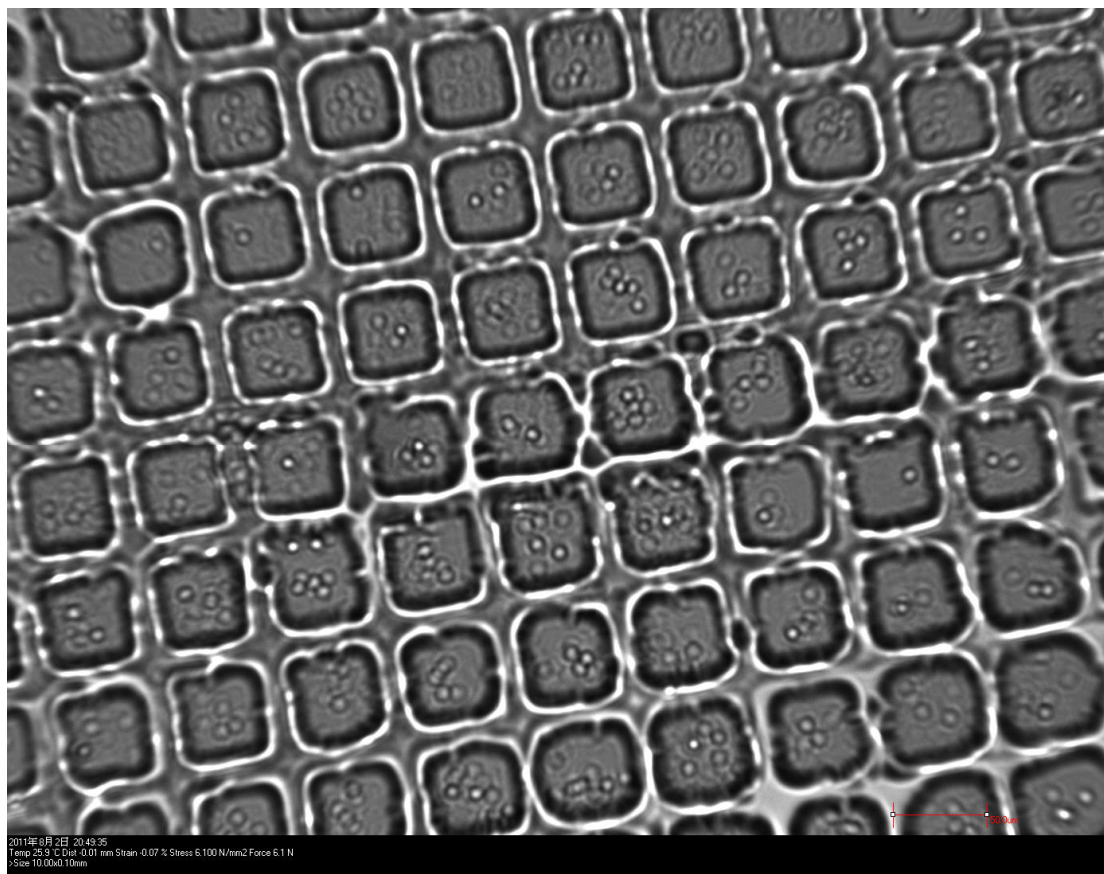
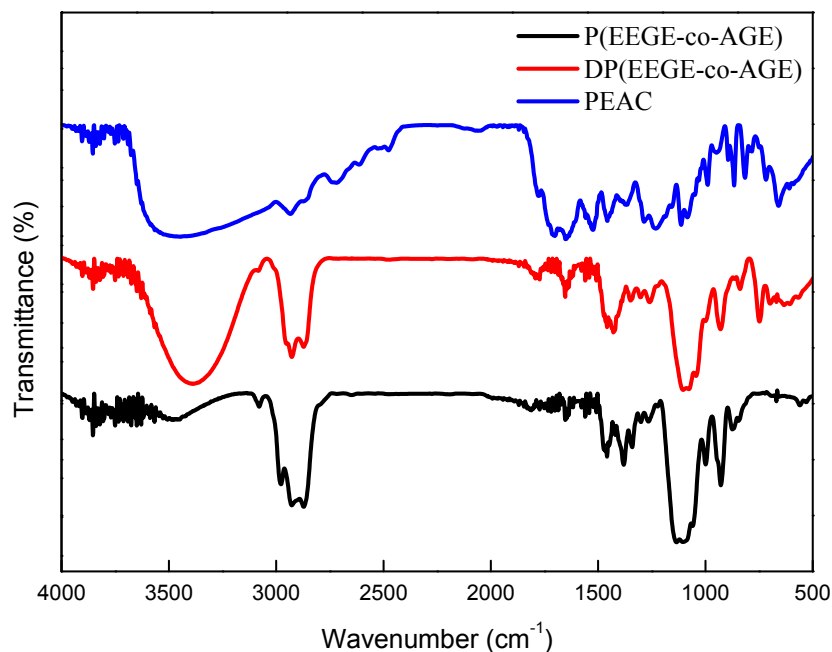


Figure S14. The FT-IR spectra of the three synthesized polymers: P(EEGE-co-AGE), its deprotection [DP(EEGE-co-AGE)] and PEAC.



In FT-IR spectra, there is a strong absorption peak around 3400 cm⁻¹ after the removal of protection of hydroxyl groups of P(EEGE-co-AGE). When the deprotected polymer further was modified by DOPA (PEAC), the peak around 3400 cm⁻¹ became wide and strong and the characteristic peaks of benzene ring appeared (1608, 1525 and 1462 cm⁻¹).

Figure S15. The photographs of the cell adhesion assay observed after 3T3 fibroblast cell culturing for 4 hrs at 37 °C by inverted fluorescence microscopy on the bare (A), PEAC-modified (B) and further thiol (MPA) modified (C) substrate surfaces of glass. All the figures have the same scale bar as in Figure 5 in the main text.

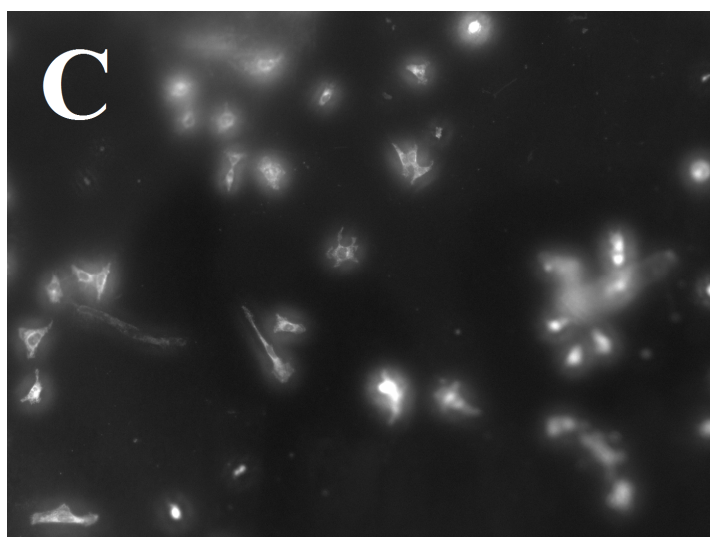
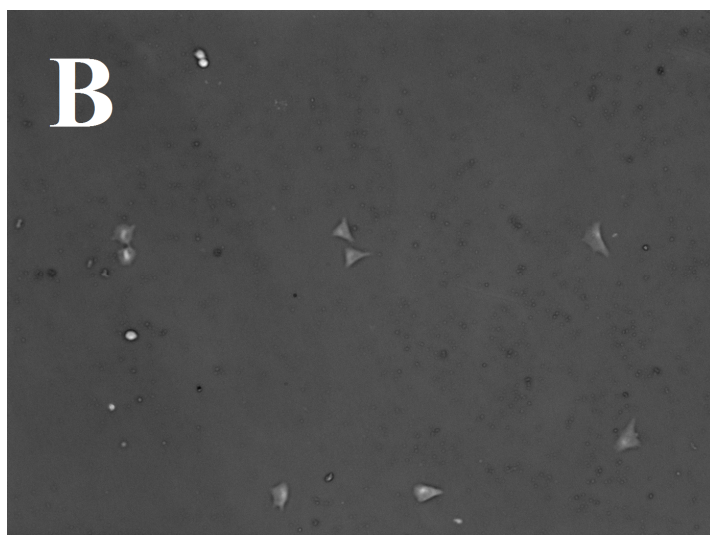


Figure S16. The photographs of the cell adhesion assay observed after 3T3 fibroblast cell culturing for 4 hrs at 37 °C by inverted fluorescence microscopy on the bare (A), PEAC-modified (B) and further thiol (MPA) modified (C) substrate surfaces of Ti. All the figures have the same scale bar as in Figure 5 in the main text.

