

Supplementary data

Title: Development of mechano-responsive polymeric scaffolds using functional silica nano fillers for control cellular functions

Griffin M,¹ Nayer L.¹, Butler P.E.^{1,2}, Palgrave R.G.³, Seifalian A.M., Kalaskar D. M.*¹

¹*UCL Centre for Nanotechnology and Regenerative Medicine, Division of Surgery & Interventional Science, University College London, London, United Kingdom*

²*Royal Free London NHS Foundation Trust Hospital, London, United Kingdom*

³*Department of Chemistry, University College London, 20 Gordon Street, London, WC1H 0AJ.*

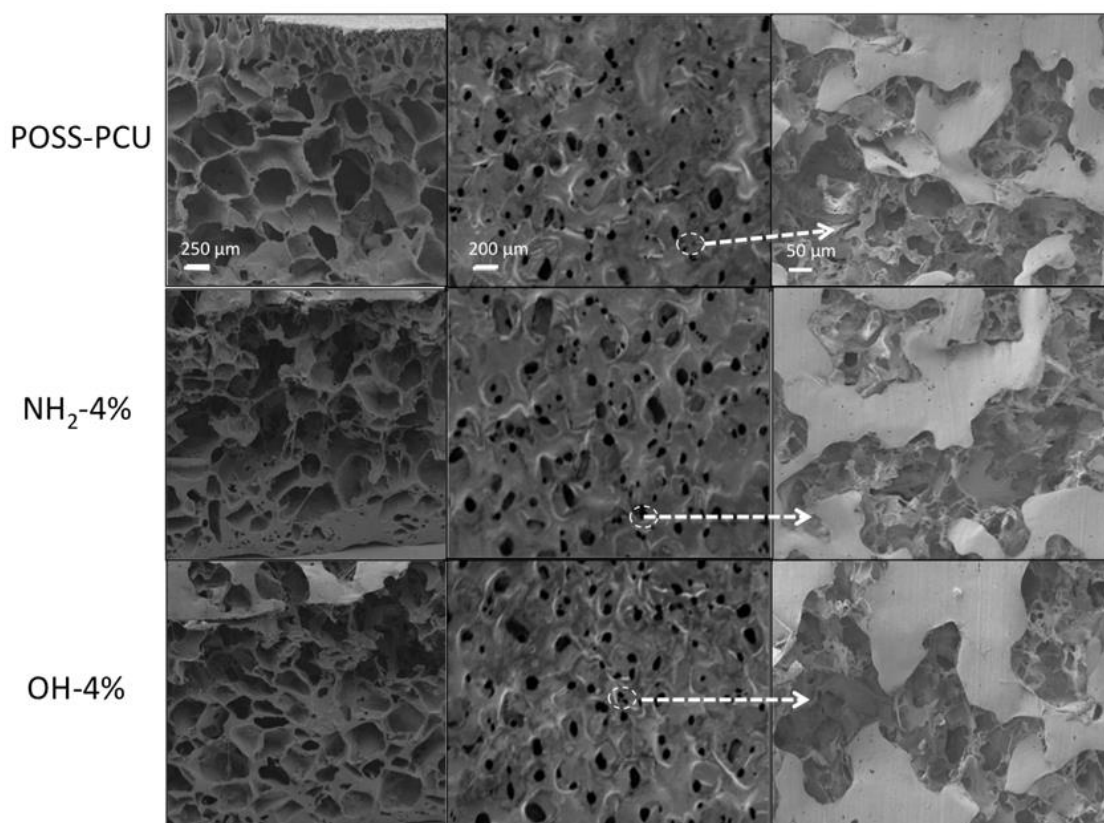


Figure S1. Scanning electron microscopy images of the scaffolds after modification with the fumed silica nanoparticles and fumed silica nanoparticles functionalized with amine nanoparticles (n=3). Key; NH₂: POSS-PCU modified with amine nanoparticles OH: POSS-PCU modified with fumed silica nanoparticles POSS-PCU: Unmodified scaffolds.

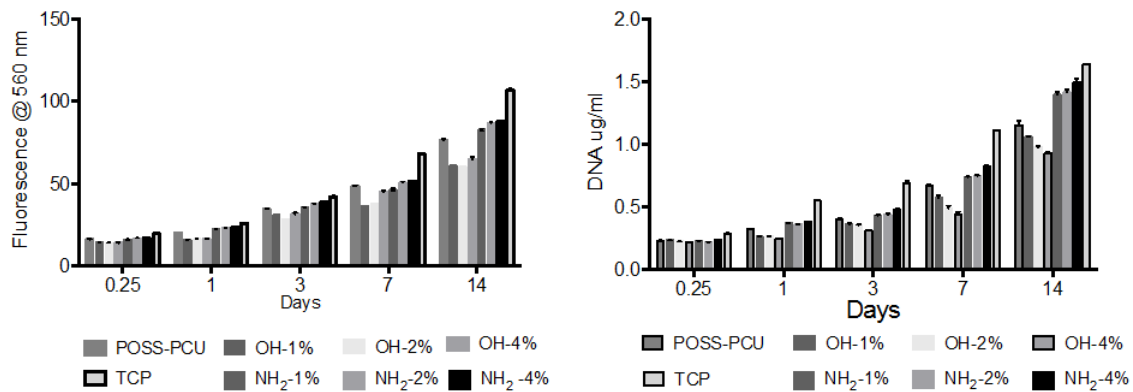


Figure S2. Human dermal fibroblast behaviour over 14 days on the modified scaffolds with increasing amounts of silica nanoparticles. (A) Cell viability using alamar blue assay (n = 6). (B) Total DNA assay (n = 6). HDFs showed a similar cell viability and growth on the modified scaffolds over a 14 day period. Key; NH₂: POSS-PCU modified with amine nanoparticles OH: POSS-PCU modified with fumed silica nanoparticles POSS-PCU: Unmodified scaffolds.

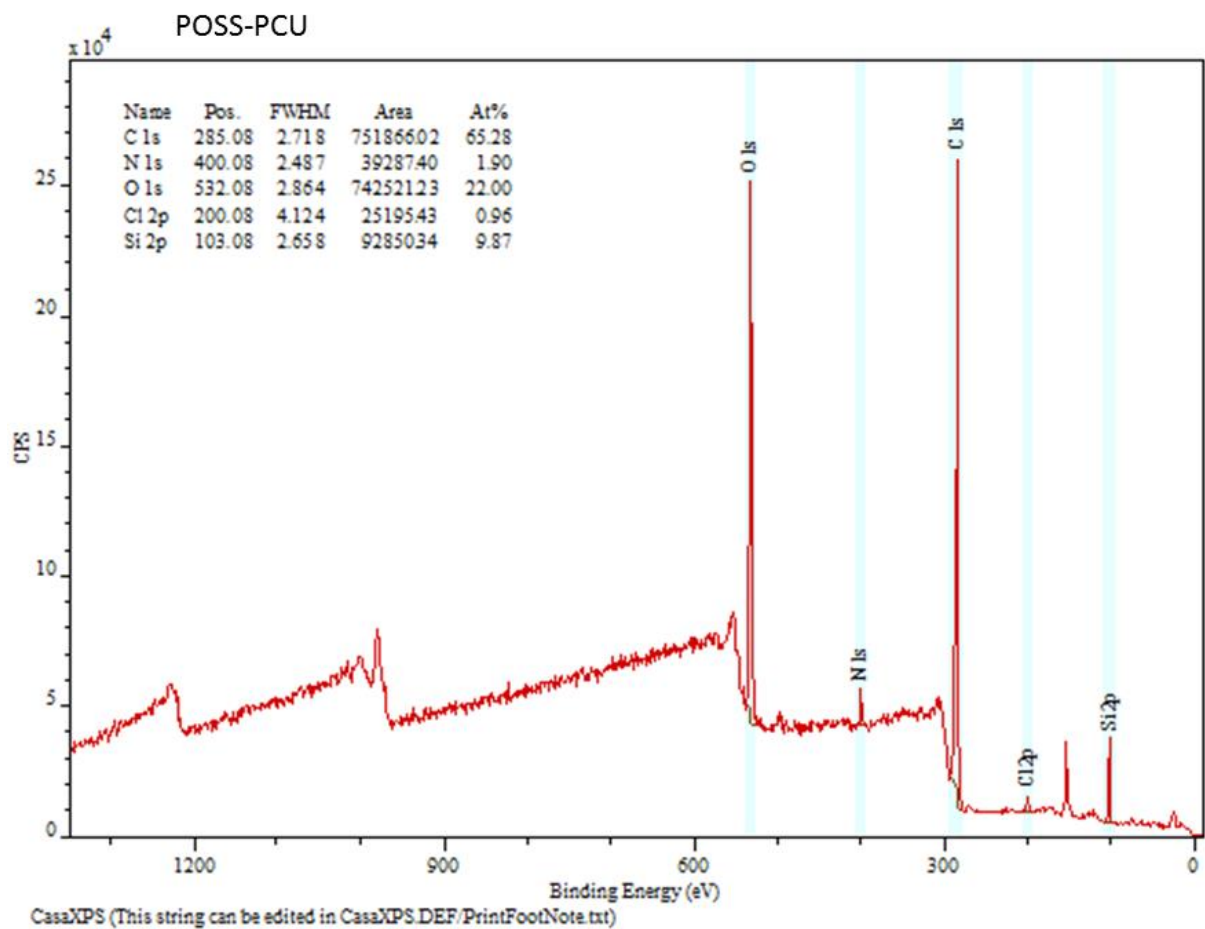


Figure S3. X-ray photoelectron spectroscopy (XPS) survey spectra of POSS-PCU.

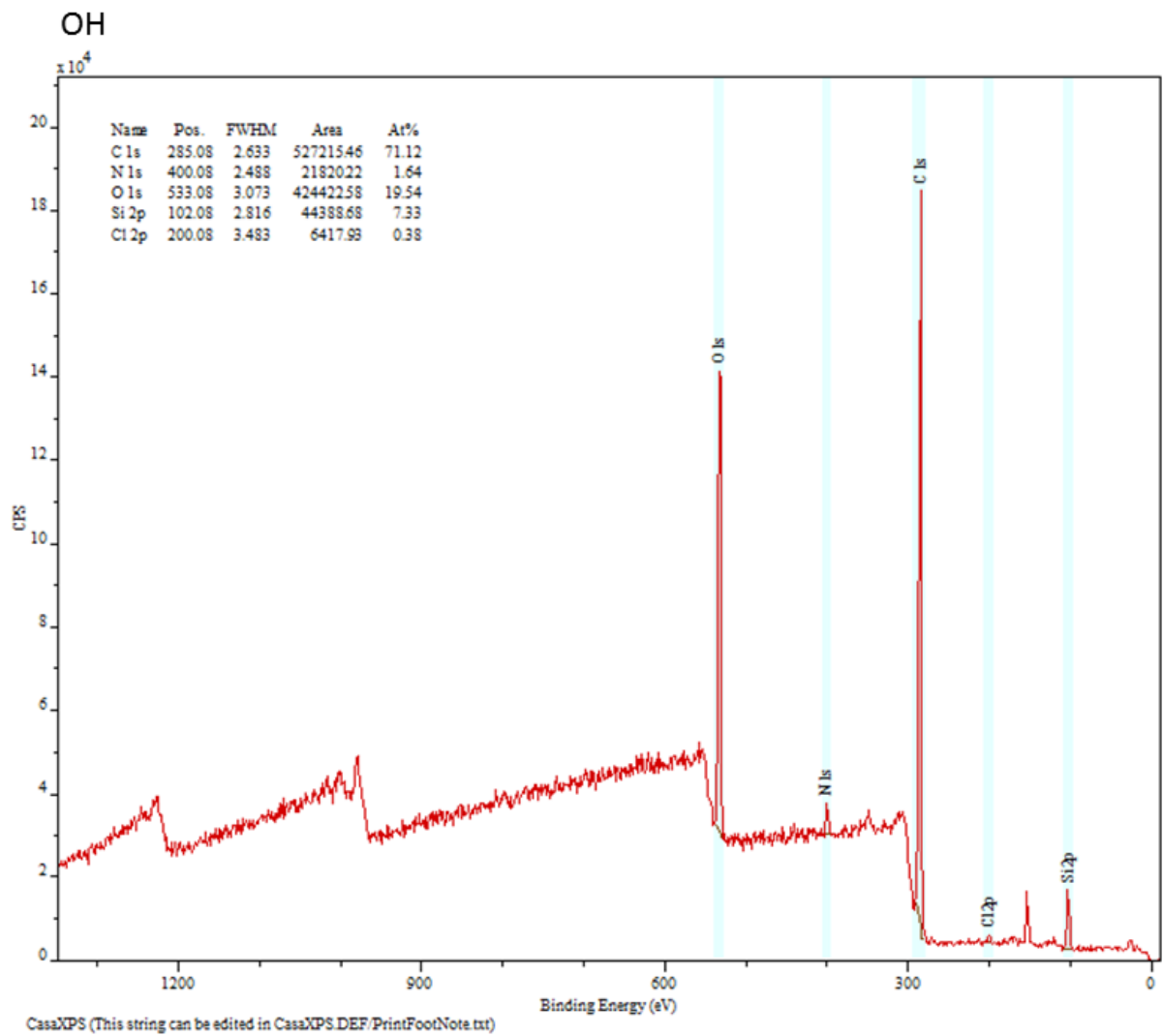


Figure S4. X-ray photoelectron spectroscopy (XPS) survey spectra of POSS-PCU modified with fumed silica nanoparticles .

NH₂

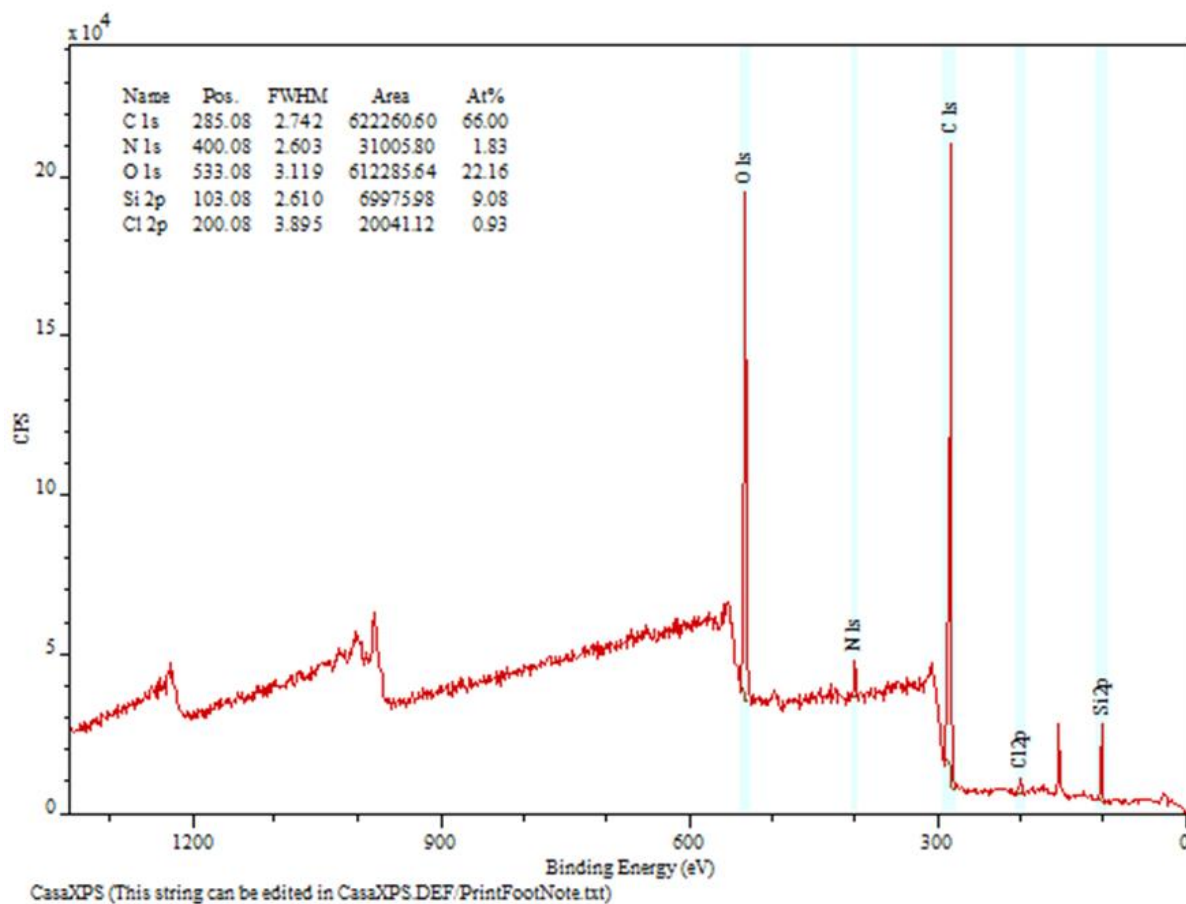


Figure S5. X-ray photoelectron spectroscopy (XPS) survey spectra of POSS-PCU modified with fumed silica nanoparticles functionalized with amine groups (NH₂).

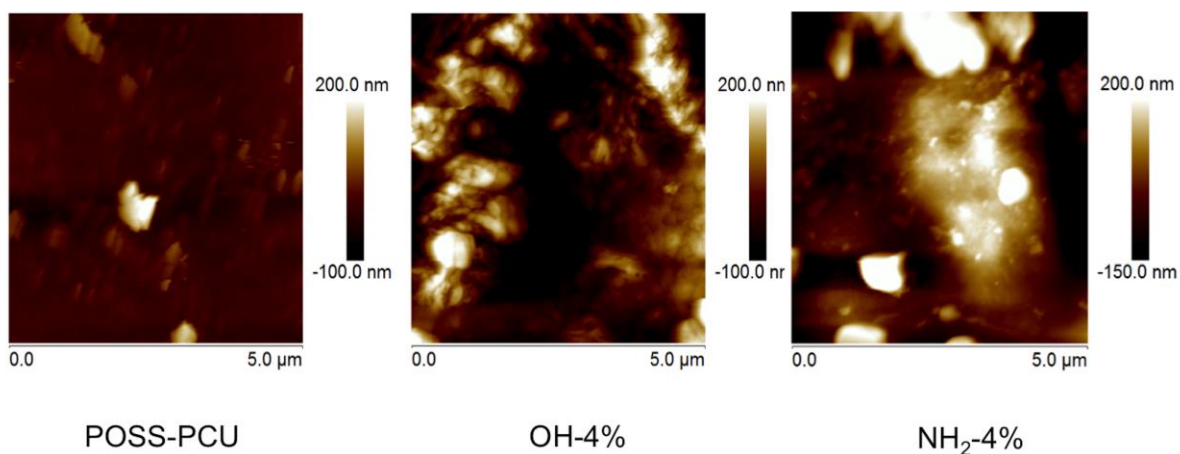


Figure S6 Atomic Force Microscopy Images of the POSS-PCU scaffold and POSS-PCU modified with 4% fumed silica nanoparticles (OH) and 4% fumed silica nanoparticles modified with amine (NH₂).

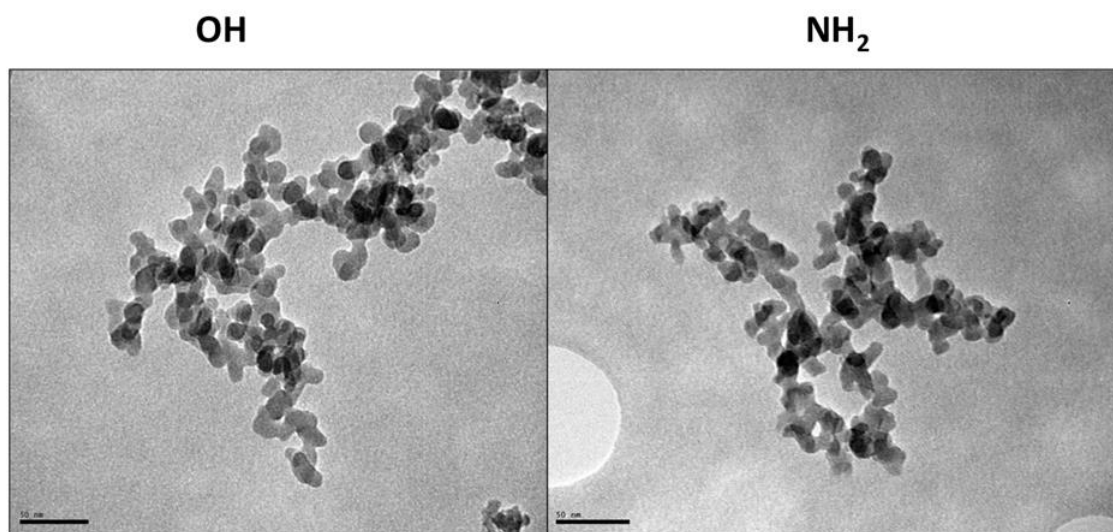


Figure S7. Transmission Electron Microscopy (TEM) of the fumed silica nanoparticles (OH) and fumed silica nanoparticles modified with amine (NH₂).