Pegah Esmaeilzadeh et al., J Nanomed Nanotechnol 2017, 8:6(Suppl)
DOI: 10.4172/2157-7439-C1-058



## A smart cell carrier nanosystem made from thiolated polysaccharides

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Mimicking the functions of macromolecules, nanotechnology approaches have made great efforts to synthesize adaptive and stimuli-responsive biointerfaces for new therapeutic functions in medical implants or supporters for tissue growth/regeneration. Here, we introduce a switchable medical coating system made of 5 bilayers of thiolated- chitosan and thiolated-chondroitin sulfate biopolymers. This synthesized foundation were structured by bottom-up layer by layer technique. The idea of this study is a new cyclical methodology that enables forward and reverse surface reconstructions of cell-adhesive properties of multilayers by switching from oxidation to reduction direction (Oxi-to- Re) [figure 1] and in opposite from reduction to oxidation direction (Re-to-Oxi). While the rearrangements of surface charge, content of free thiol-groups and wettability characteristics after cyclical manipulations were tested by zeta potential, UV–Vis, and water contact angle techniques, monitoring the human dermal fibroblast cell– coating interactions confirms the smart multifunctionality of this novel coating model towards switchable protein adsorption/desorption and cell attachment/detachment rules.


Figure 1. The representative infographic displays the effect of Oxi-to-Re surface reconstructions of our designed nanosystems on fibroblast cell line. (Oxi: Oxidation environment, Re: reduction environment.)

### Biography

Pegah Esmaeilzadeh's M.S. researches in the field of synthesis and characterization of single-walled natural protein nanotubes, and their byproduct architectures such as protein nanofibers, nanospheres, and nanoparticles have been successfully developed in nanotechnology section of RIPI of Tehran (Research Institute of Petroleum Industry). She was also active in different research projects on ZnO quantum dots as novel antibacterial, antifungal, or anticancer drugs. She is currently PhD student in institute of pharmacy in Martin Luther University Halle Wittenberg in Germany, and receiving new experiences in medical nanocoatings/interfaces/thin films and particularly cell studies.

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