

7th World Congress on

BIOPOLYMERS AND POLYMER CHEMISTRY

June 04-06, 2018 Osaka, Japan

Responsive polymers brushes as effective tools for modulating bio interfaces

Mohaddeseh Kahram^{1,2} and Justin Gooding^{1,2}¹The University of New South Wales, Australia²ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, Australia

Smart surfaces have recently aroused interest because of their wide applications in different fields of science and technology. In such surfaces, the surface properties are altered by applying stimuli such as pH, light and electrical potential and regenerated by removing it or applying an alternative trigger. One of the interesting applications of these surfaces is developing substrates that can mimic the dynamic properties of biological systems in response to applied stimuli. Electrical potentials and ionic strength have been shown as active stimuli that trigger specific conformational transitions in the surface-bound molecules to facilitate rapid and reversible switching. The idea these switchable surfaces is modifying an electrode surface with a polymer brush which is anchored to the surface via “grafting to” method which contains charged all over its polymeric backbone. Then, applying the same or opposite polarity of the potential, or different ionic strength causes the polymer to repel or attract to the surface respectively. This concept has been previously used successfully to switch the cell adhesion on the surface using GRGDS peptides in the monolayer. In this current work, we promoted the idea to be able to mimic and use larger biological components using polymer as a switching element. Also, gold nanoparticles are being used as platforms for putting down the receptors of interest on the surface. So, this surface will ultimately be able to mimic different biological events like T cells activation by choosing the right size of the polymer and gold nanoparticles.

m.kahram@unsw.edu.au