OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Pharmaceutics & Novel Drug Delivery Systems
April 08-10, 2013 Hilton Chicago/Northbrook, USA

Demethoxycurcumin-containing colloidal chitosan hybrid coating with nanotopographically-controlled texture for modulating the growth and proliferation of vascular smooth muscle and endothelial cells

Yen-Jen Wang
National Chiao Tung University, Taiwan

Biofunctionalization of scaffolds frequently employed different biomolecules or active substances to enhance the preferential growth, proliferation, or differentiation of specific cells. However, a subtle change in the distribution, activity, and density of such active substances over a giving surface may alter the biological behavior of localized cells. In this work, a facile nano-topographical control over a stainless steel surface via an electrophoretic deposition of colloidal amphiphilic chitosan (termed CHC) for preferential growth, proliferation, or migration of vascular smooth muscle cells (VSMCs) and endothelial cells (HUVECs) was evaluated. Atomic force microscopy (AFM) revealed that both cells demonstrated distinct morphogenesis, adherent responses, and biochemical properties on the surfaces of various nanotopographical textures; termed as "sharp" (i.e., high peak-to-valley texture) surface, S-CHC and "flat" (i.e., low peak-to-valley texture) surface, F-CHC, indexed by "Kurtosis" value. Further incorporation of an effective antioxidant drug, demethoxycurcumin, a synergistic effect as a result of interplay between the drug and the nano-topographical morphology on the cellular behaviors of VSMCs was observed. This work highlighted a promising development of such an assembly of nano-topographic functionalized surface together with therapeutic drug upon which a cell-specific therapeutic strategy can be easily manipulated with improved therapeutic performance.

qqw1220@gmail.com