Promotion of Mesenchymal Stem Cell Differentiation by Collagen Micropatterns and Plasma Polymerized Anti-Corrosion Thin Films

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Abstract

This presentation will be composed by 2 parts: modulation of stem cell differentiation and applications of plasma thin film.

The first part of presentation reports how to apply collagen microislands with different aspect ratios, areas, and symmetries by photolithography method to guide Wharton's Jelly mesenchymal stem cells (WJ-MSCs) differentiation. The adipogenic differentiation and osteogenic differentiation of WJ-MSCs will be elucidated on the microislands with different shape and size. In addition, the photobiomodulation will be discussed on the effects of WJ-MSCs differentiation, which can be applied in tissue engineering and regenerative medicine.

The second part of the presentation will focus on the plasma polymer thin film deposition. An effective and dry process to deposit plasma polymerized hexamethyldisilazane (ppHMDSZ) thin film on Ti and SS to evaluate the corrosion behavior will be reported. Meanwhile, the long-term efficacy of ppHMDSZ coatings on metals to prevent corrosion were studied at environment with higher temperature to create accelerating corrosion conditions.