

Surface Engineering of Titania for Excellent Fibroblast 3T3 Cell-Metal Interaction

Roshasnorlyza Hazan^{1,*}, Srimala Sreekantan¹, Adilah Abdul Khalil²,
Ira Maya Sophia Nordin² and Ishak Mat²

¹School of Materials and Mineral Resources Engineering,
Engineering Campus, Seri Ampangan 14400 Nibong Tebal, Seberang Perai Selatan
²Advanced Medical and Dental Institute, Universiti Sains Malaysia, Suite 121 & 141,
Kompleks EUREKA, 11800 Universiti Sains Malaysia, Pulau Pinang, Malaysia

*Corresponding author: roshasnorlyza@gmail.com

Abstract: *The present study is focussed on clarifying the influence of different surface structures (nanotubes, thin film and foam) of titania (TiO₂) on the cell interactions of fibroblast (3T3) cells. The nanotubes were prepared by an anodisation process; thin film, by a sol-gel method, and foam, by the sacrificed polymeric sponge method. Their in vitro bioactivity was investigated by soaking the sample in complete growth medium (RPMI-1640/DMEM) with 3T3 cells. Field Emission Scanning electron microscope (FESEM) micrograph and optical density results showed that self-arrayed TiO₂ nanotubes strongly enhanced cellular activities, followed by the foam structure and the thin film. Atomic Force Microscope (AFM) results provided evidence that the enhanced cell interaction in nanotubes is associated with the roughness of the surface.*

Keywords: surface engineering, TiO₂ nanotubes, TiO₂ thin film, TiO₂ foam, cell-metal interaction