

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spontaneous Differentiation of Dental Pulp stem cells on Dental polymers

ANEEL BHERWANI, Oral Biology and Pathology, Stony Brook University, GIULIA SUARATO, SISI QIN, CHUNG-CHEH CHANG, Materials Science, Stony Brook University, AARON AKHAVAN, Ramban Mesizta High School, JOSEPH SPIEGEL, VLADIMIR JURUKOVSKI, MIRIAM RAFAILOVICH, Materials Science, Stony Brook University, MARCIA SIMON, Oral Biology and Pathology, Stony Brook University — Dental pulp stem cells were plated on two dentally relevant materials i.e. PMMA commonly used for denture and Titanium used for implants. In both cases, we probed for the role of surface interaction and substrate morphology. Different films of PMMA were spun cast directly onto Si wafers; PMMA fibers of different diameters were electro spun onto some of these substrates. Titanium metal was evaporated onto Si surfaces using an electron beam evaporator. In addition, on some surfaces, P4VP nanofibers were spun cast. DPSC were grown in alpha-MEM supplemented with 10% fetal bovine serum, 0.2mM L-ascorbic acid 2-phosphate, 2mM glutamine and 10mM beta-glycerol phosphate either with or without 10nM dexamethasone. After 21 days samples were examined using confocal microscopy of cells and by scanning electron microscopy (SEM) and Energy dispersive X-ray Analysis (EDAX). In the case of Titanium biomineralization was observed independent of dexamethasone, where the deposits were templated along the fibers. Minimal biomineralization was observed on flat Titanium and PMMA samples. Markers of osteogenesis and specific signaling pathways are being evaluated by RT-PCR, which are up regulated on each surface, to understand the fundamental manner in which surfaces interact with cell differentiation.

Aneel Bherwani
Oral Biology and Pathology, Stony Brook University

Date submitted: 12 Nov 2011

Electronic form version 1.4