



Academy of Prosthodontics Annual Scientific Session Sofitel Hotel, Chicago, Illinois May 9-12, 2018

Program Speaker - Dr. Konstantinos Michalakis

Title

Biocompatibility and Antimicrobial Effect of Ti Surfaces Modified with Ag Nanoparticles

Abstract

Biofilm has been related with post-operative implant-associated infections. The aim of this study was to develop a biocompatible nanosilver-doped Ti-surface with antibacterial properties. Silver nanoparticles of 8 and 30nm were incorporated on Ti-6Al-4V substrates via electrochemical deposition in three concentrations (100ppm, 200ppm, 300ppm). The presence of silver was confirmed by scanning electron microscopy SEM/EDX analysis. The release of silver from the surfaces to cell culture media was assessed by atomic adsorption spectroscopy. MTT and BRDU viability assays conducted on human osteosarcoma cell lines in three time-points (24h, 48h, 72h), showed no signs of toxicity. Increased metabolic activity was observed, whilst proliferation rates were significantly reduced, especially at groups with high silver concentrations (300ppm). There was a concentration-dependent antibacterial effect against *P.gingivalis* and *P.intermedia* periopathogens. The results of this study indicate that nanosilver-implanted titanium surfaces are promising and biocompatible materials, which could be utilized for the prevention of implant-associated infections.

Learning Objectives

1. Recognize the impact of nanotechnology on dental implant design.
2. Distinguish the difference between this and previous research on this topic.
3. Recognize the critical concentration and size of nanoparticles that can inhibit implant-related infections.

Biography

KONSTANTINOS MICHALAKIS

Konstantinos Michalakis graduated from the Aristotle University of Thessaloniki, in 1989. He then attended the postgraduate Prosthodontics program at Tufts University. He completed his doctorate in 2001. He became board certified in 2004, and in 2008 he was awarded the MSc degree from the Department of Bioengineering of Strathclyde University, UK. He was recently awarded a certificate in Executive Leadership for Healthcare Professionals from Cornell University. He has lectured extensively and has authored numerous articles in peer-reviewed journals. He is currently an Adjunct Associate Professor at Tufts University, and a tenured Associate Professor and Director of the Graduate

Prosthodontics program at the Aristotle University. He maintains a private practice limited to Prosthodontics in Thessaloniki, Greece. He regularly reviews manuscripts for numerous journals. He is also an external examiner at the University of Otago. He is a fellow of the ACP, a member of the ICP, AAFP, EPA and IADR.