



Academy of Prosthodontics Annual Scientific Session Ritz-Carlton, Sarasota Florida April 25 – April 29, 2017

Program Speaker - Dr. Cortino Sukotjo

Title

Biofunctionalization of Collagen Membrane with Thin Film of TiO₂ Deposited using Atomic Layer Deposition Technique

Abstract

Collagen membrane has traditionally been used in dentistry as a tissue scaffold during dental surgeries. However, acceleration of bone healing and new bone formation using native collagen membrane as bone-grafting material still remains a challenge. In this study, collagen membrane was coated with thin film (< 50 nm) of titanium dioxide (TiO₂) utilizing room temperature Atomic Layer Deposition (ALD) technique. A novel precursor-oxidizer system (tetrakis (dimethylamino) titanium or TDMAT as titanium precursor and ozone as oxidizer) for this process has been used to deposit TiO₂ thin film. This TiO₂-ALD coated collagen membrane has been characterized further to assess its activity as a biomaterial. Our results revealed that TiO₂ coating improved in-vitro bioactivity of collagen membrane in terms of increased biocompatibility, better mechanical property and ability to attract Calcium (Ca) and Phosphorous (P) from aqueous solution.

Learning Objectives

1. To understand the function of Atomic Layer Deposition (ALD) technique
2. To understand the application of ALD on dental material
3. To understand the effect of TiO₂ coating on collagen membranes

Biography

CORTINO SUKOTJO, DDS, PhD, MMSc, FACP

is a tenure Associate Professor at the University of Illinois at Chicago (UIC), College of Dentistry and an adjunct associate professor in the Department of Biomedical Engineering at UIC. Dr. Sukotjo received his DDS Degree from the Padjadjaran University, Indonesia, followed by Ph.D in Oral Biology from UCLA and Certificate in Prosthodontics-MMSc from Harvard School of Dental Medicine. Currently, he is pursuing a Master of Health Professional Education at Department of Medical Education, College of Medicine, UIC. He is a Diplomate of the American Board Certified Prosthodontics, Fellow of the American College of Prosthodontists (ACP), Associate Fellow of the Academy of Prosthodontics, ADEA/William J. Gies Foundation Education Fellow, and Past President of the IADR/AADR Prosthodontic Research Group. He was recently awarded as the Clinician/Researcher Award by ACP, Best Research Mentor of the year by UIC-COD and the past recipient of the ACP Young Prosthodontist Innovator Award. Dr. Sukotjo has co-authored 110 peer-reviewed articles and 4 book chapters.