



Academy of Prosthodontics Annual Scientific Session Naples, Florida | May 3 – 6, 2023

Program Speaker – Steve Sadowsky

Title

The Dental Application of Novel High-Performance 3D Printed Polymers

Abstract

In 2007, a number of investigators reported poor prosthetic stability of both the provisional and definitive complete arch fixed implant prostheses. Both veneer fracture and tooth wear were common mechanical complications. A low-cost highly durable substitute for methyl methacrylate with a digital workflow was needed. The evolution of a commercially available polymer using additive manufacturing will be discussed from ideation to research to clinical trials. Other dental applications will also be reviewed. From the materials perspective, the challenge was to develop photopolymers that offer substantially increased strength with simultaneously enhanced toughness, which are typically contradictory property targets. Formulations in which crosslinked polymers are reinforced via strong noncovalent coordinating interactions are successfully addressing these needs. Ongoing studies have identified related new 3D printable materials that further extend the bounds of polymeric material performance with excellent potential to contribute to the continued evolution of digital dentistry.

Learning Objectives

1. Identify unmet needs in dentistry for material science advancement
2. Summarize the research that has led to high performance polymers using additive manufacturing
3. Discuss present and future applications of new polymers

Biography

Dr. Sadowsky is professor in the Department of Preventive and Restorative Dentistry at the University of the Pacific Arthur A. Dugoni School of Dentistry. He is past-president of the American Prosthodontic Society and the Pacific Coast Society for Prosthodontics, as well as a fellow of the Academy of Prosthodontics and the American College of Prosthodontists (ACP). Dr. Sadowsky is Abstract Editor of the International Journal of Prosthodontics and has been appointed to the Editorial Council of The Journal of Prosthetic Dentistry. He has published more than 40 articles in peer-reviewed journals. He has coauthored 3 patents on polymer chemistry. Dr. Sadowsky has edited a book, titled Evidence-based Implant Treatment Planning

and Clinical Protocols. In 2021, the ACP selected him for the Distinguished Service Award. In 2022, Dr. Sadowsky's article, "Are Teeth Superior to Implants" was selected for the Judson Hickey Award for the best research article.

