

Selected research topics in Biomedical Engineering: Developments in Dental Research

Location: Kleiner Hörsaal, Universitäres Zentrum für Zahnmedizin Basel (UZB)

Date and time: Thursday, February 28, 2019, 12:00-13:30

Enamel of Mice and Men - Unique Structures and Properties

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Abstract. This lecture will discuss how enamel is put together, how it works, how it comes apart, the importance of its preservation, and how we can best use it in restorative dentistry. Topics will include the linkage of genes to masticatory function, the mantra of genes expressing proteins, their assembly into matrices that guide biomineralization, the miracle of biofabrication. Unlike other hard tissues, the enamel proteinaceous matrix is removed and the formative cells senesce and die. The organizational hierarchy from nanometer-scale to macroscopic organization will be described. Although enamel is almost completely composed of hydroxyapatite crystallites, it is much tougher and softer than its constituent – how does this happen? The remarkable dentinoenamel junction unites dissimilar bioceramics, flexible dentin and stiff enamel, born of different germ lines, for a lifetime or a millennium – how does this happen? Avoidance of Man's grief and pain will be addressed, strategies for remineralization and restoration will be described. Is Molar Incisor Hypomineralization (MIH) really a developmental disorder or is it simply due to rapid carious demineralization after eruption, and act of God or of diet? Finally, enamel will be described as an immutable biomarker of allostatic stress received during tooth development to allow identification of the vulnerable.

Curriculum. Shane N. White graduated from dental school at Trinity College, Dublin, Ireland. He spent several years in private practice and part time teaching in Dublin. He then completed residencies in Prosthodontics and Endodontics at UCLA, and a PhD in Craniofacial Biology at USC. He enjoys teaching in DDS, specialty, and advanced degree programs; he is interested in curriculum and faculty development. His research focuses upon dental biological materials, principally genetic-structural relationships in enamel; he also works on patient-centered clinical outcomes. He has authored over 120 research papers, given over 300 invited lectures, and held a handful of NIH grants. He is a Professor at the UCLA School of Dentistry, where he served as Chairman of the Section of Endodontics. He served the University of California system in various leadership positions including chair of UC Academic Council and Faculty Representative to the Board of Regents. He surfs whenever he can.