



Date: Monday, November 10, 2014, 2:00pm - 3:00pm
Location: Latrobe 106
Speaker: Van Thompson PhD, DDS
Professor of Biomaterials, Biomimetics & Biophotonics
King's College London Dental Institute
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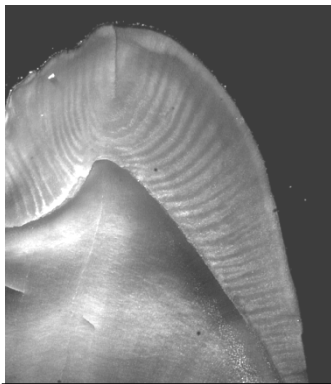
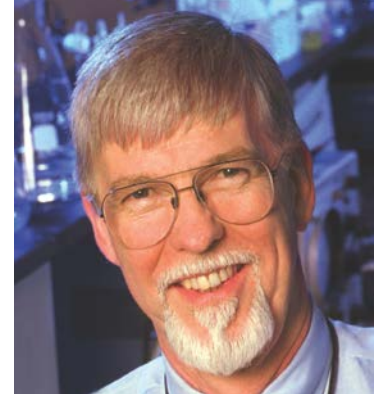


Fig. Human molar enamel cusp in reflected polarized light. Light lines are decussation of prisms at 40 degrees toward the viewing surface. Dark zones those oriented away from viewing surface. All prisms bundles align at the enamel outer surface.

Dental Enamel- a Multi-Scale Modelling Challenge

The tooth is a unique functionally graded composite structure at several levels providing a hard and apparently self-healing enamel external shell bonded to a dynamic and resilient dentin core both supported by a vascular and neural network in the tooth pulp. Tooth enamel is nature's cell derived method for production of a high elastic modulus (~ 90 GPa), hard, wear, and fatigue resistant structure. This presentation will review the micro and meso structure of human teeth as well as studies on their Hertzian contact and Vickers indentation response. The fracture toughness measurements of enamel and dentin by several groups and the need to further explore mechanical response with enamel location and orientation are discussed. Emphasis will be on the role of decussation on enamel properties and likely mechanisms for enamel self-repair of microcracks when teeth are fatigued.

About the Speaker

Van P Thompson, DDS, PhD, is currently, Professor of Biomaterials, Biomimetics and Biophotonics at King's College London Dental Institute and was previously Chair, Biomaterials and Biomimetics, NYU College of Dentistry. Known for his work on adhesion and bonded bridges at the University of Maryland he has published many articles and made numerous presentations on dental biomaterials in the U.S. and internationally. His current research areas include dentin caries activity, all-ceramic crown fatigue and fracture, modifications of dentin for bonding, engineering tissue response via scaffold architecture and practice based research (PEARL Network).

Faculty Host: Prof. Somnath Ghosh, Latrobe 203, 410-516-7833, sgghosh20@jhu.edu

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