**Why did my filling fall out?**

*Investigations of the Resin-Dentin Bond in Dental Composites Using Raman Spectroscopy*

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**Friday, November 7, 2014**  
2:00 PM  
A121 Science Building

**Abstract:** Clinically, polymer fillings bonded to the dentin in a tooth are not as long-lived as those bonded to the enamel. The stability of the resin-dentin bond can be compromised either during its formation or during its use. A better understanding of these contributing factors in the failure of the resin-dentin bond is critical in order to improve dentin adhesive performance. The resin-dentin bond is created by the incorporation of acrylate monomer(s) with a free-radical photoinitiator system into the demineralized collagen matrix. This resin system is then photopolymerized using visible light to provide an interface for the resin composite filling. Raman spectroscopy provides a highly sensitive means of detecting chemical bonds and their changes during reaction and/or over time. Here, this spectral information is used to characterize the extent of monomer conversion in the adhesive resin layer and the component concentrations across the resin-dentin interface in different storage media. Understanding these results enables recommendations for changes in adhesive materials and/or application methods to provide better results for this type of dental restorations.

**Biography:** Dr. Julie L. P. Jessop is an Associate Professor of Chemical & Biochemical Engineering at the University of Iowa. She received her B.S. in 1994 and her Ph.D. in 1999, both in Chemical Engineering from Michigan State University. Dr. Jessop’s research interests include spectroscopy, epoxide/acrylate photopolymerizations, dental resins, electron-beam polymerizations, and polymers from renewable resources. She has received a National Science Foundation CAREER award and the College of Engineering Faculty Excellence Award for Service. She is active in the American Chemical Society Division of Polymeric Materials: Science & Engineering as a Past Chair and Current Councilor, in RadTech as a standing member of the Technical Conference Review Committee, and for Project Lead the Way as an Affiliate Professor. She was selected to participate in the National Academy of Engineering’s Frontiers of Engineering Education (FOEE) and the American Society for Engineering Education’s Virtual Community of Practice (VCP). She enjoys teaching chemical engineering, and as an alumna of FOEE and VCP, has been championing active learning principles and experimenting with “flipped classrooms.”

**Faculty, staff and students are cordially invited to attend**