

## NANO-BME Seminar

**Time: 4:00PM Thursday, Feb 24**

**Location: EP253 and <https://sdsmt.zoom.us/j/94046899625>**

### Biology vs. Biomaterials: A Battle as Old as Time in Dentistry

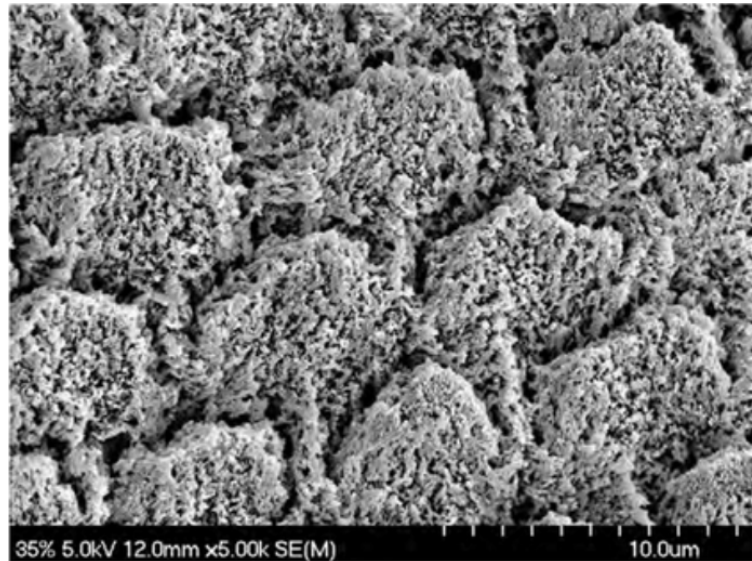
Dr. Trey Sauvage, DDS

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**Abstract:** My aim for this presentation is to provide the audience a basic understanding of dentistry and the daily struggles encountered trying to find equilibrium between biology and biomaterials. Some of the common biomaterials seen on a daily basis in the realm of general dentistry are dental amalgam, resin composite, resin modified glass ionomer, zirconia, lithium disilicate, gold and titanium. With many applications of materials in the dental field, all of these materials are tried and true, but also have downsides that make their applications difficult within the oral cavity, leaving room for further research and development.

Furthermore, biomedical applications aside from materials will be touched on, such as 3D imaging, 3D printing and modeling, digital intraoral scanning and guided surgical implant placement. When compared to the history of dentistry, many of these concepts are very modern, and a few, ahead of their time. As with the materials, all of these applications would be greatly benefited from further research and development and advancement. Research and advancement from whom? Biomedical engineers are a great start!

\*Additional topics regarding BME and dentistry will be addressed as seen fit by the presenter



**Figure:** SEM image of enamel etched with 35% phosphoric acid for 15 seconds. Acid etching of enamel increases porosity depth and quality of enamel surface, allowing for stronger bonding between the tooth and composite resin.

**About the speaker:** Dr. Sauvage received an MS in Biomedical Engineering from SDSMT in '17 and his Doctorate in Dental Surgery (DDS) from the University of Minnesota in '21. He is currently an associate dentist at Swanson Dental Group in Rapid City, SD. Dr. Sauvage also serves as the only practicing dentist within the Pennington County Jail system.

