



**PennState**

**AGRICULTURAL AND  
BIOLOGICAL ENGINEERING**

**Spring 2018 Seminar Series**

**“Bacterial Cellulose Chewing Gum  
with Extended Xylitol Release”**

Risk for dental caries is correlated with exposure time in acidic environments. A chewing gum that releases xylitol over an extended time is desired for maximizing beneficial effects. Data has yet to be collected about the time release properties of xylitol sweetened chewing gum made from a bacterial cellulose gum base. Furthermore, it is unknown if the release time can be extended by incorporating pectin within the bacterial cellulose pellicles. In this experiment, bacterial cellulose was produced from *G. xylinum* ATCC 53582. The harvested cellulose pellicles were freeze dried then rehydrated in different solutions. The first solution contained xylitol, the second contained xylitol and pectin, the third contained xylitol and xyloglucan. The physical properties were collected and compared using an Instron universal strength testing machine. Next, the gums were placed in distilled water and solution samples were taken at one-minute intervals. Xylitol concentrations were determined using high-pressure liquid chromatography. It is presumed that gum containing pectin will have a significantly longer xylitol retention time. The results may indicate that bacterial cellulose based chewing gum with carbohydrate additives extends the release time of xylitol than the same gum without additives. If produced for consumer consumption, cellulose-based gum with carbohydrate additives may provide longer lasting benefits improving oral cavity health by extending the release time of xylitol.

**Presented By  
Tyler Kane**

**Senior in the Schreyer Honors College**

Tyler Kane is a senior in the Schreyer Honors College pursuing a degree in biological engineering (food and bioprocess option) and a minor in biomedical engineering. After graduation, he will be attending dental school at the University of Pennsylvania.

**Wednesday, February 28, 2018**

**12:00 PM**

**304 FOREST RESOURCES LAB**