

ERIC CONSTANT, Dept of Natural Science and Art, University of Charleston, Charleston, WV, 25304, and MARK WATSON, Dept of Natural Science and Art, University of Charleston, Charleston, WV, 25304. Strength of Bacterial Nanocellulose Based on Type of Saccharide Present During Formation

Bacterial nanocellulose (BNC) is produced by an interaction of a symbiotic colony of bacteria and yeast (SCOBY) in conjunction with a sugar source and the appropriate pH and temperature. BNC is sought after for its diverse uses from wound dressings and drug delivery to a food additive. This is based on different chemical and physical properties from the crystallinity to the diameter of the fiber within the SCOBY. It can be used for many different applications, specifically tissue engineering, where strength comes into play. In this study, the strength of the BNC was measured depending on the sugar type added to the media and if it was a monosaccharide or a disaccharide. The SCOBY was grown in a fermented black tea media. The average wet weight yield for the glucose, fructose, maltose, and lactose were taken and found glucose had the highest yield. After the drying cycle, samples were tested for ultimate tensile strength and the dry thickness was gauged. The glucose was found to be 34% thicker and 32% stronger than fructose. It was found that monosaccharides outperformed disaccharides in the thickness and strength. The information from knowing the sugar that produces strongest SCOBY can lead to advances in the different uses such as tissue engineering.