Advancements in Sustainable Packaging Materials and Processes, using PHA produced from Food Wastes

Young Teck Kim[1*] Haibo Huang[2], Zhiwu Wang[3]

[1]Department of Sustainable Biomaterials, Virginia Tech, USA

[2] Food Science and Technology, Virginia Tech, USA

[3]Biological Systems and Engineering, Virginia Tech, USA

Young Kim; ytkim@vt.edu

Abstract:

Biological or technical circularity of sustainable packaging materials is one of the core approaches in the circular economy. Adopting sustainable packaging materials is a promising solution to replace non-sustainable packaging polymers. Due to the recent global pandemic and lifestyle changes oriented toward convenience and safety, single-use plastic consumption has increased, aggravating environmental and health problems such as white pollution and microplastics. There is a strong societal demand for sustainable packaging, driving advancements and developments in the following areas: 1) Producing more sustainable and renewable materials from agricultural and food waste, 2) Advancing biomanufacturing processes to improve the potential for commercialization, and 3) Developing appropriate target applications that enable commercialization without compromising key properties such as home compostability and ocean biodegradability. Based on these technical trends, this presentation will demonstrate how our team has successfully developed home-compostable polyhydroxyalkanoates (PHAs) from food waste and how we address the technical challenges of using bioplastics in diverse packaging applications by developing new biomanufacturing processes.