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Structure of Hydrophobically Modified Phytoglycogen Nanoparticles JOHN ATKINSON, University of Guelph, JONATHAN NICKELS, Oak Ridge National Laboratory, JOHN DUTCHER, University of Guelph, JOHN KATSARAS, Oak Ridge National Laboratory — Phytoglycogen is a highly branched, polysaccharide nanoparticle produced by some varieties of plants including sweet corn. These particles are attractive candidates for cosmetic, industrial and biomedical applications. Many of these applications result from phytoglycogen's unique interaction with water: (1) high solubility; (2) low viscosity and high stability in aqueous dispersions; and (3) a remarkable capacity to sequester and retain water. Neutron scattering measurements of native phytoglycogen revealed that the particles have uniform size, uniform radial particle density, and a high level of hydration. Hydrophobically modifying the outer surface of the hydrophilic nanoparticles opens up new applications in food and biomedicine, such as solubilizing and stabilizing bioactive compounds. One such modification is octenyl succinate anhydride (OSA), where the hydrophobicity can be tuned by adjusting the degree of substitution. I will present the results of small angle neutron scattering (SANS) measurements of aqueous dispersions of OSA-modified phytoglycogen with two different degrees of modification. Contrast series SANS measurements have yielded information about the radial density profile, providing insight into the nature of the chemical modification of the particles.

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