

Liposomal drug delivery has been at the forefront of nanoparticle drug delivery systems for nearly 30 years. These liposomes and their components, including lipids, must be highly characterized to provide the ideal conditions for effective drug delivery. Among the commonly used lipids in liposome formation are ceramides and sphingolipids. Recent discoveries regarding bacterial ceramide synthesis have created opportunities to incorporate novel, previously uncharacterized, bacterially derived sphingolipids into these synthetic membranes. Here, we report on the development of various analyses to characterize the effects that novel sphingolipids have on membrane biophysical properties, as well as our efforts to purify and characterize the novel *C. crescentus* lipid, Ceramide Poly-Phosphoglycerate (CPG2).