

Interaction of spherical fullerenes with lipid monolayers and bilayers

STEVEN O. NIELSEN¹, CHI-CHENG CHIU¹, RUSSELL H. DEVANE², AND WATARU SHINODA³

¹ *Department of Chemistry, The University of Texas at Dallas, 800 West Campbell Road, Richardson, Texas 75080, United States (steven.nielsen@utdallas.edu)*

² *Corporate R&D, Modeling and Simulation, The Procter and Gamble Company, Cincinnati, Ohio 45069, United States*

³ *National Institute of Advanced Industrial Science and Technology (AIST), 1-8-31 Midorigaoka, Ikeda 563-8577, Japan*

Abstract

The behavior of spherical fullerenes in lipid membranes is of interest from both fundamental and health viewpoints. For example, it has been suggested that fullerene toxicity is attributable to particle aggregation, which can thus be approached from a colloidal stability perspective¹. Aggregation will be examined using several molecular simulation approaches². In addition, spherical fullerenes can affect the folding, or buckling, properties of lipid membranes. This topic will be explored in both lipid monolayers and bilayers^{3,4}.

¹ Chi-cheng Chiu, Russell H. DeVane, Michael L. Klein, Wataru Shinoda, Preston B. Moore, and Steven O. Nielsen, *J. Phys. Chem. C* **116** 23102-23106 (2012).

² Chi-cheng Chiu, Russell H. DeVane, Michael L. Klein, Wataru Shinoda, Preston B. Moore, and Steven O. Nielsen, *Journal of Physical Chemistry B* **114** 6394-6400 (2010).

³ Arben Jusufi, Russell H. DeVane, Wataru Shinoda, Michael L. Klein, *Soft Matter* **7** 1139 (2011).

⁴ Chi-cheng Chiu, Wataru Shinoda, Russell H. DeVane, and Steven O. Nielsen, *Soft Matter* **8** 9610-9616 (2012).