Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Aggregation of Phosphoinositides at Phisiological Calcium Concentrations[1] ADOLPHE KAZADI BADIAMBILE, Physic Department, Syracuse University,, MARTIN B. FORSTNER, Syracuse Biomaterials Institute, Syracuse University — Phosphoinositides play a crucial role in many cellular functions such as calcium signaling, endocytosis, exocytosis and the targeting of proteins to specific membrane sites. To maintain functional specificity, it has been suggested that phosphoinositides are spatially organized in "pools" in the cellular plasma membrane. A possible mechanism that could induce and regulate such organization of phosphoinositides is their interaction with Ca2+ ions. Understanding the physicochemical mechanism that can regulate membrane structure is a crucial step in the development of adaptive biomimetic membrane systems. Using Langmuir monolayers, we investigated the effect of bivalent calcium and magnesium cations on the surface pressure-area/lipid isotherm of monolayers of phosphatidylinositol (PI), phosphatidylinositol bisphosphate (PIP2) and dioleoylphosphatidylglycerol (DOPG) and dipalmitoylphosphatidylcholine (DPPC). It is found that the decrease of area per lipid, i.e. the increase in aggregation, is dependent on both the lipid's head group charge, the bivalent cation and temperature. However, electrostatics are not sufficient to account for all experimental observations. Thus additional interactions between ions and phosphoinositides need to be considered.

[1]The National Science Foundation (NSF)

Adolphe Kazadi Badiambile
Physic Department, Syracuse University

Date submitted: 29 Dec 2011 Electronic form version 1.4