

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Lipid Nanodiscs as potential carriers of enzymes: a light scattering study** KIRIL STRELETZKY, GHAITH TAWALBEH, MEKKI BAYACHOU, Cleveland State University — The structure and dynamics of discoidal phospholipid protein complexes (nanodiscs) with and without endothelial nitric oxide synthase (eNOS) were studied with multiangle polarized and depolarized light scattering. Nanodiscs present a mobile system that is similar to enzyme's native microenvironment which allows to explore the potential effect of membrane phospholipids on the activity of eNOS. Light scattering revealed at least two different size distribution modes for empty nanodiscs, and nanodiscs loaded with eNOSoxy. In both cases, the first mode was diffusive (linear  $\Gamma$  vs  $q^2$  with a small intercept) with apparent  $R_h = 4.5$  nm for empty nanodiscs and 4.9nm for loaded nanodisc, sizes consistent with nanodisc dimensions. The second mode contributed only about 20% to the intensity and showed non-diffusive behavior which might correspond to coalesced nanodiscs present in solution. Studied concentration dependencies and depolarized scattering measurements on enzyme free and enzyme loaded nanodiscs corroborated these findings. Also, the specific activity of nanodiscs-bound eNOS was found to be significantly lower than the specific activity of free eNOS.

Kiril Streletzky  
Cleveland State University

Date submitted: 16 Nov 2014

Electronic form version 1.4