Abstract Submitted
for the OSF19 Meeting of
The American Physical Society

Fluorescence cross correlation spectroscopy (FCCS) to reveal molecular mechanism of lipolysis SONALI GANDHI, CHRISTOPHER KELLY, Wayne State University — The dynamics of lipids and proteins are crucial in the mechanisms of cellular functions. We aim to develop novel methods for revealing the interactions between lipolysis associated proteins adipose triglyceride lipase (ATGL), perilipin (PLIN), and alpha beta hydrolase domain-containing protein 5 (ABHD5). We have applied fluorescence cross-correlation spectroscopy to study the interactions between these lipids and proteins. We focus a super-continuum laser (400-700 nm) to excite fluorophores within a small detection volume, the fluorescent proteins that diffuse through the diffraction limited spot will emit a fluctuating signal. The fluorescence emission is chromatically spread by passing via prism and collected by a CMOS. The intensity vs time of each color channel are extracted through linear least-square fitting of each camera frame and temporally correlated to reveal the characteristic dynamics of the proteins. From auto- and cross-correlation functions, we measure the diffusion rates and fraction correlated. We use model membranes of giant unilamellar vesicles (GUVs) locked inside agarose gel to study characteristic and interaction between these proteins in presence of phospholipid with and without the ligand. Results from this study will enable us to understand lypolysis.

Sonali Gandhi
Wayne State University

Date submitted: 20 Sep 2019 Electronic form version 1.4