Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Porphyrin Induced Laser Deactivation of Trypsinogen-Trypsin Conversion[1] JOANNA PERIDO, Undergraduate Researcher, LORENZO BRANCALEON, Professor, PI — Pancreatitis is caused by the inflammation of the pancreas, where the digestive enzyme trypsin is activated from the precursor enzyme trypsinogen while still in the pancreas. The presence of trypsin in the pancreas causes auto-activation of trypsinogen, resulting in greater inflammation and autodigestion of the pancreas. In severe cases, this cascade effect can lead to organ failure, diabetes, and pancreatic cancer. Our hypothesis is that if trypsinogen is prevented from auto-activating into trypsin, then this cascade can be stopped. We propose to do this by inducing conformational changes in trypsinogen when bound to a photoactive porphyrin dye. Porphyrins are comprised of four linked heterocyclic groups forming a flat ring, and bind well with proteins such as trypsinogen. In this study we used spectroscopic techniques to probe the binding of meso-tetrakis (4-sulfonatephenyl) porphyrin (TSPP) to trypsinogen in vitro, as a preliminary step to then prompt and characterize conformational changes of trypsinogen through irradiation. If conformational changes are detected the trypsinogen will be tested for trypsin inactivation. This investigation may provide promising initial results to the possible use of porphyrins as an inhibitor of the self-activation of trypsinogen into trypsin, and a potential inhibitor of pancreatitis.

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Date submitted: 21 Oct 2014 Electronic form version 1.4