

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Versatile Long-Term Super-Resolution Imaging of Protein Structures by Using Transient Binding of Single Fluorescent Molecules

PhD Preliminary Research Examination

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Abstract:

We present a method, transient amyloid binding (TAB) microscopy, to image amyloid structures with nanoscale resolution using standard amyloidophilic dyes such as Thioflavin T. TAB imaging does not require covalent labeling or immunostaining of amyloids. Continuous transient binding of dye molecules to amyloid structures generates photon bursts for single-molecule localization over hours to days with minimal photobleaching. We show that TAB super-resolution microscopy can visualize various amyloid structures including aggregation intermediates hypothesized to be the most toxic to neurons and cause Alzheimer's disease. We also demonstrate that TAB can resolve the nanoscale remodeling of fibrillar amyloids over a period of ~2 days by the compound epi-gallocatechin gallate (EGCG). In the future, TAB imaging with an engineered optical microscope may reveal fine structural details of amyloid aggregates by measuring the binding orientation of amyloidophilic dyes.

DATE: Tuesday, January 22, 2019
TIME: 3:00 p.m.
PLACE: Green Hall, Room 0120

Thesis advisor:
Dr. Matthew Lew

This seminar is in partial fulfillment
of the Doctor of Philosophy degree

 Washington University in St. Louis
SCHOOL OF ENGINEERING & APPLIED SCIENCE