Organic Photochemistry

with the

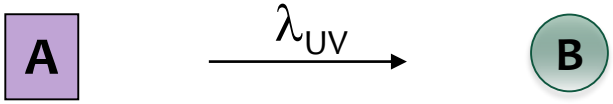
Harbron Group

WILLIAM & MARY

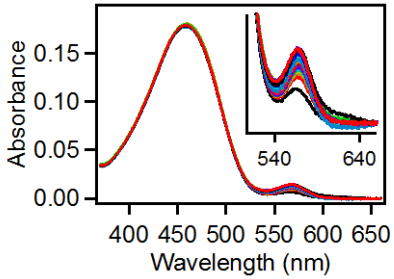
CHARTERED 1693

Photochemists use light…

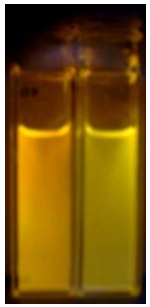
- to do chemistry

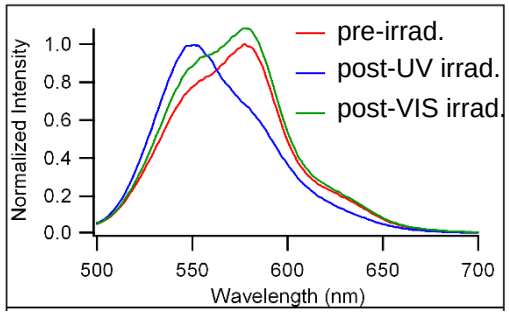


- to interrogate molecules



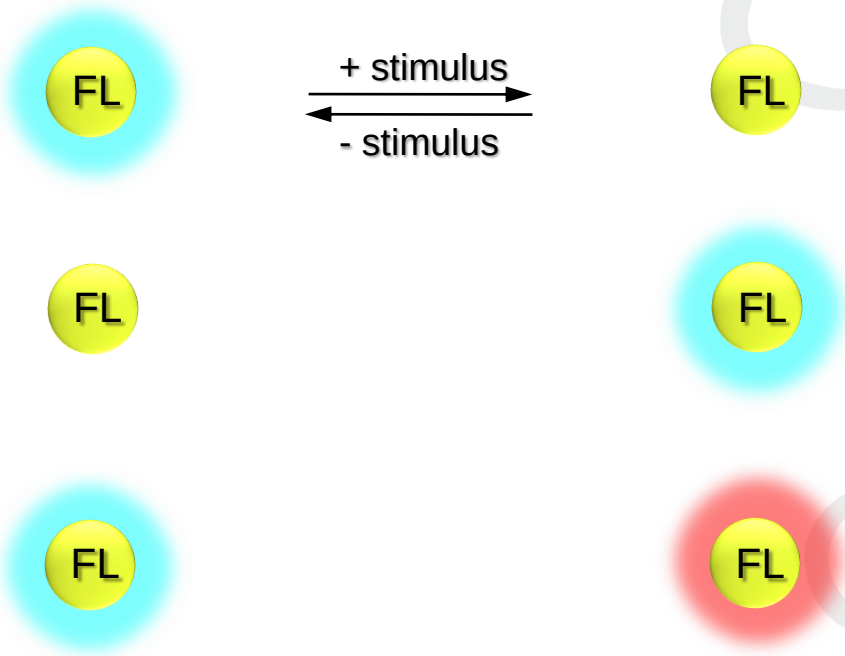
- or to do both





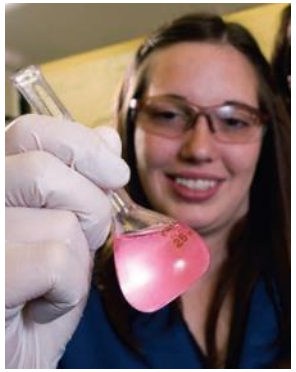
Our Focus

- Stimulus-responsive fluorescence

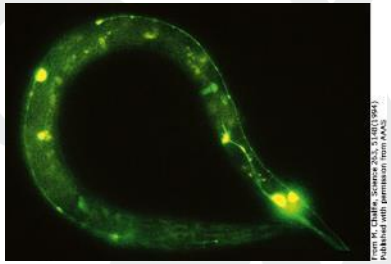


Fluorophores range from small molecules to macromolecules

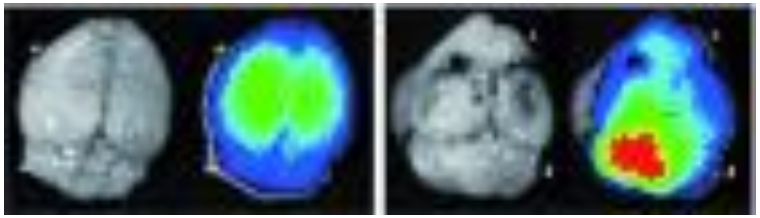
- rhodamine B



- green fluorescent protein (2008 Nobel Prize)

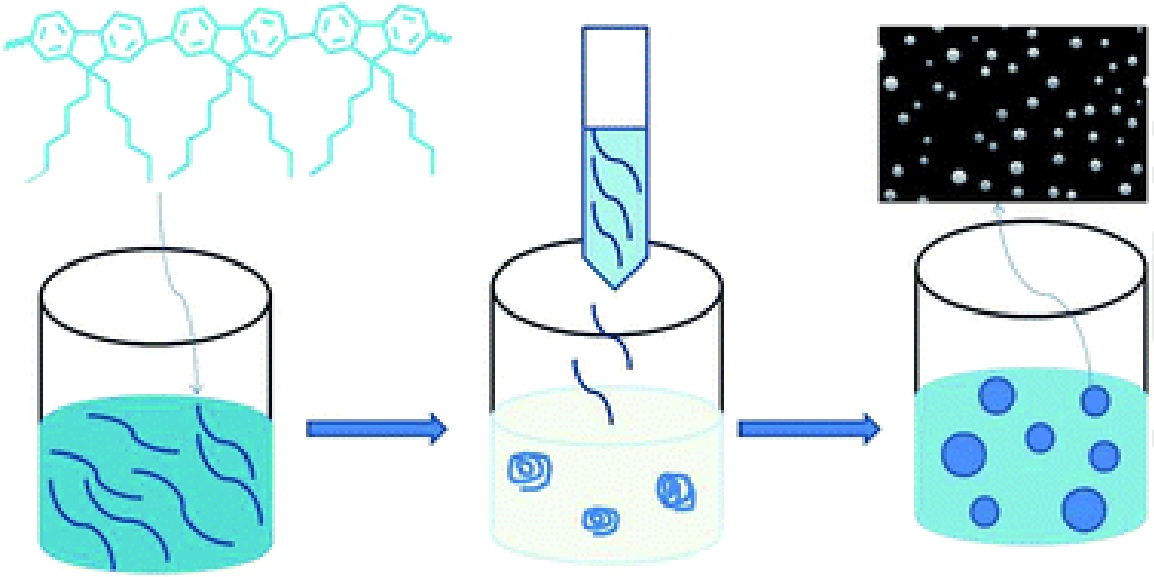


- conjugated polymer nanoparticles (**CPNs or Pdots**)



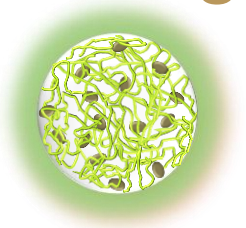
McNeill, Chiu, et al. *Angewandte Chemie Int. Ed. Engl.* **2011**, *50*, 3430

CPNs are small, spherical, and highly fluorescent



Tuncel & Demir *Nanoscale* **2010**, *2*, 484

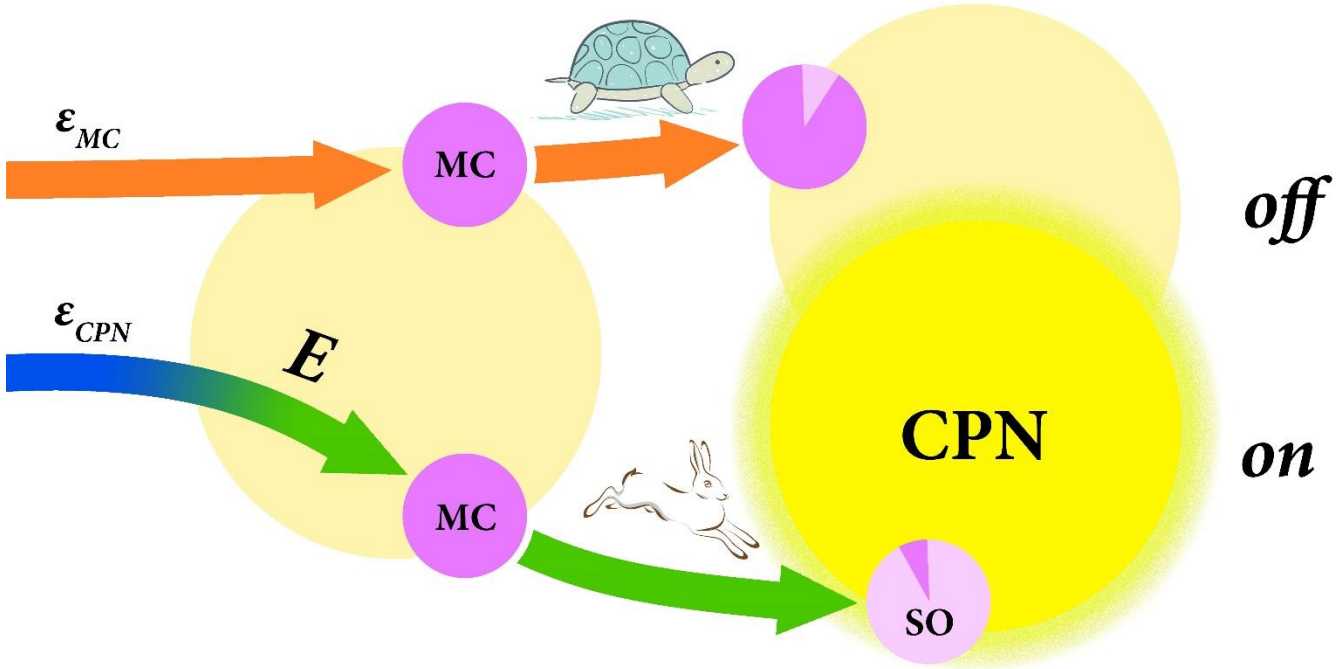
CPNs possess key advantages for sensing and imaging



- stably suspended in water
- can be functionalized with dyes or other polymers
- low cytotoxicity
- photophysical properties
  - exceptional brightness
  - outstanding photostability
  - light harvesting capability

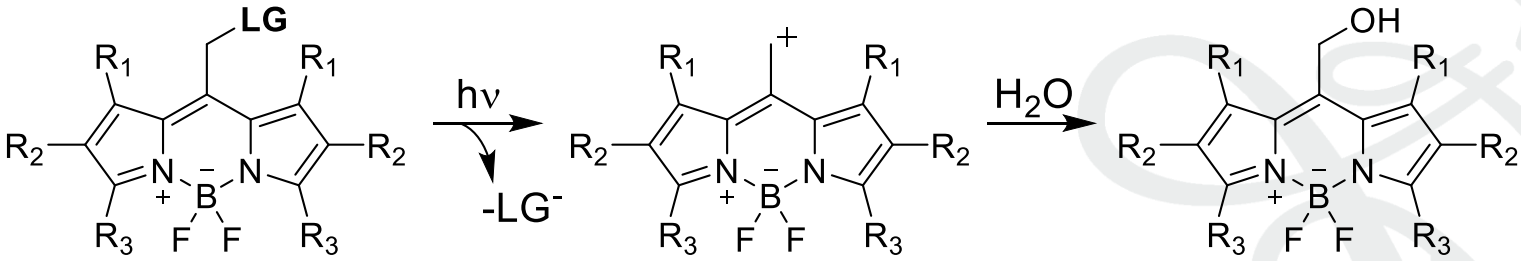
Our Focus

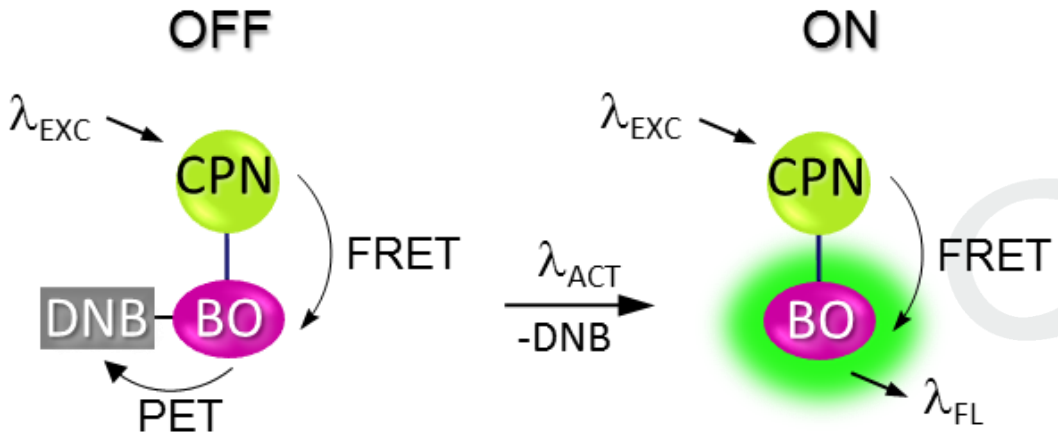
- CPNs as reaction amplifiers
  - Fundamental photophysics



Current Project Areas

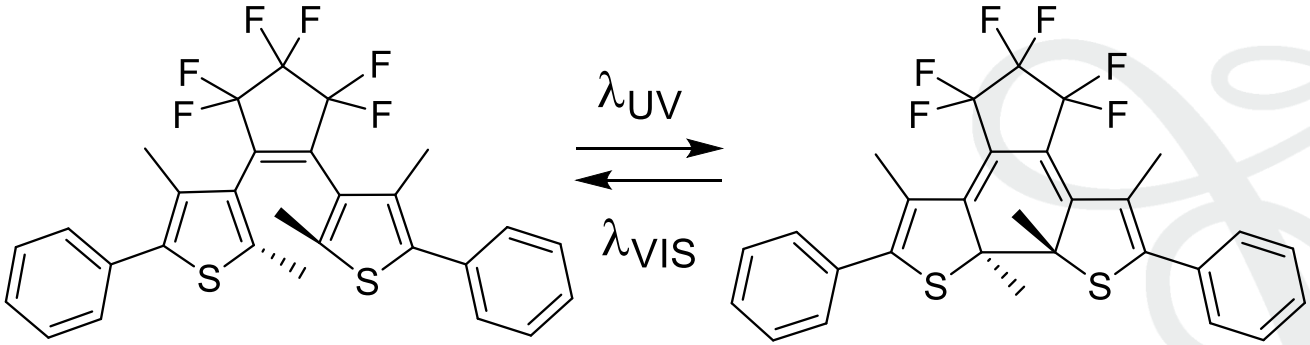
- Photoremovable protecting groups

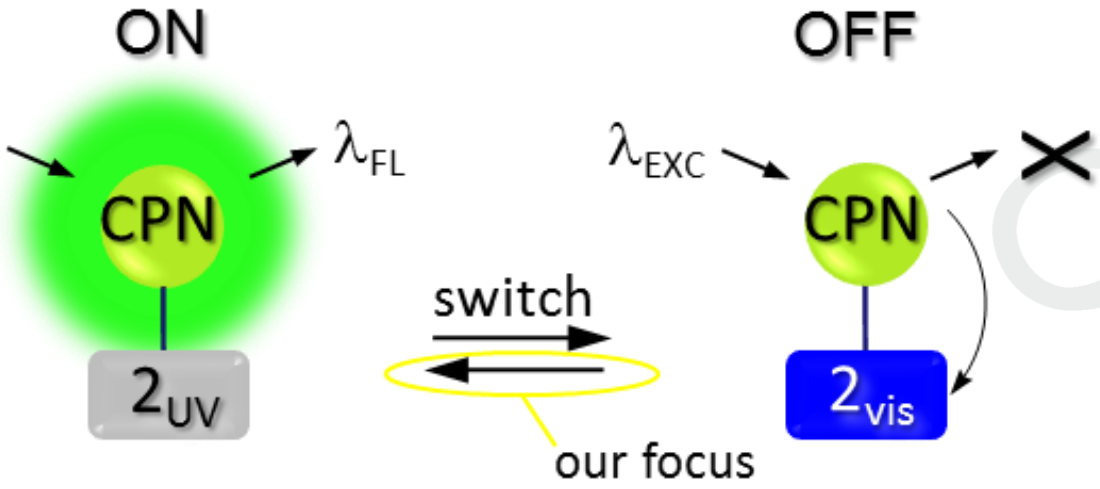




Current Project Areas

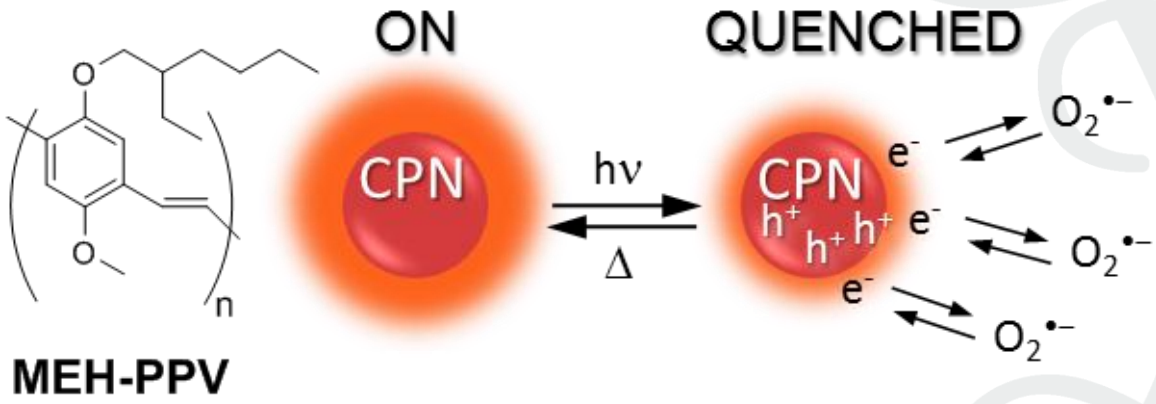
- Optimizing CPNs as reaction amplifiers



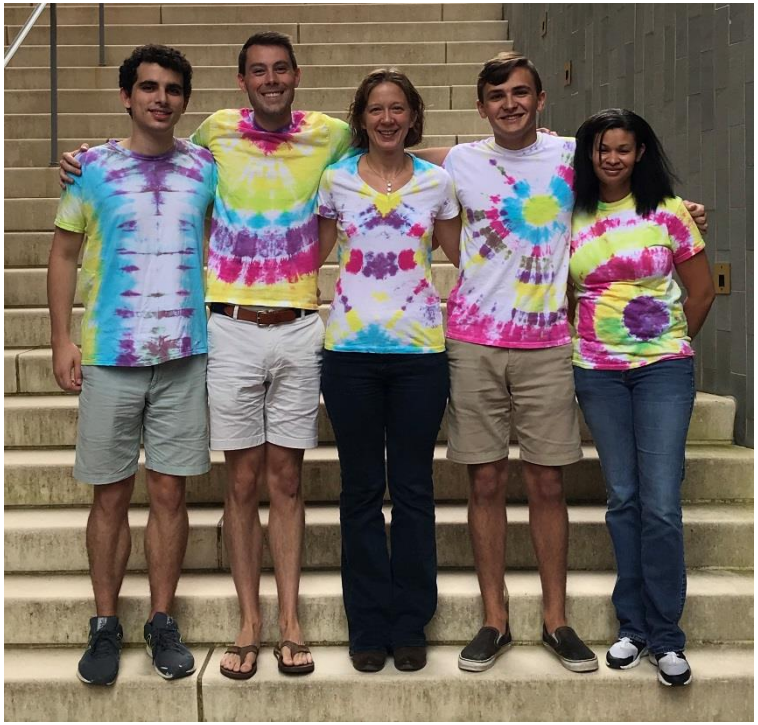


Current Project Areas

- Determining structure-dosage-property relationships for the production of reactive oxygen species

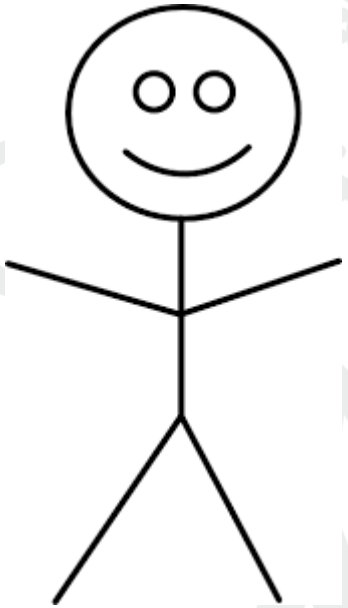


Harbron Research Lab



Andrew Dahik ‘19, Matt McCarron MS ‘18,
Matthew Goodwin ’21, Lisa Graves MS ’19

+



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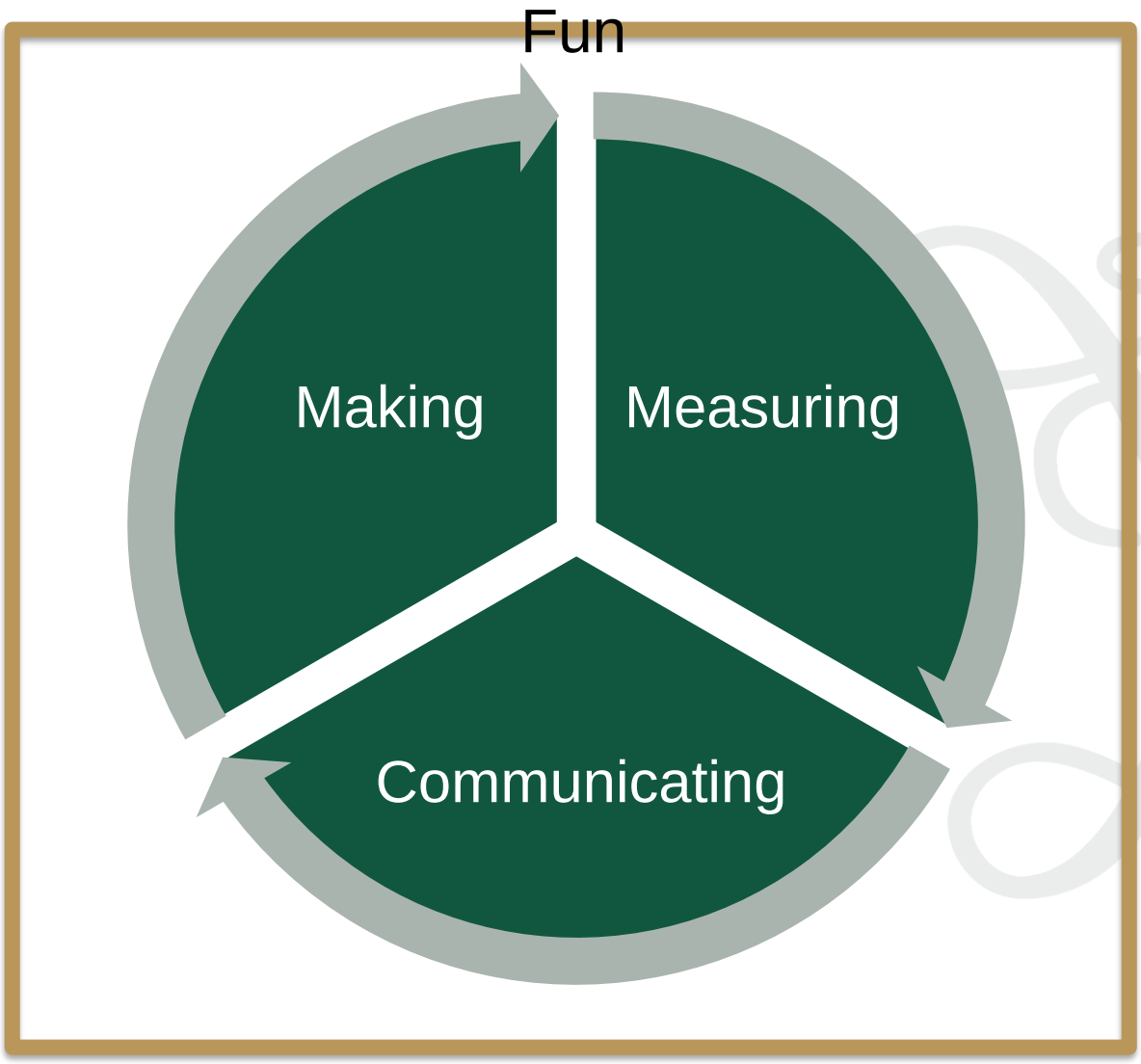
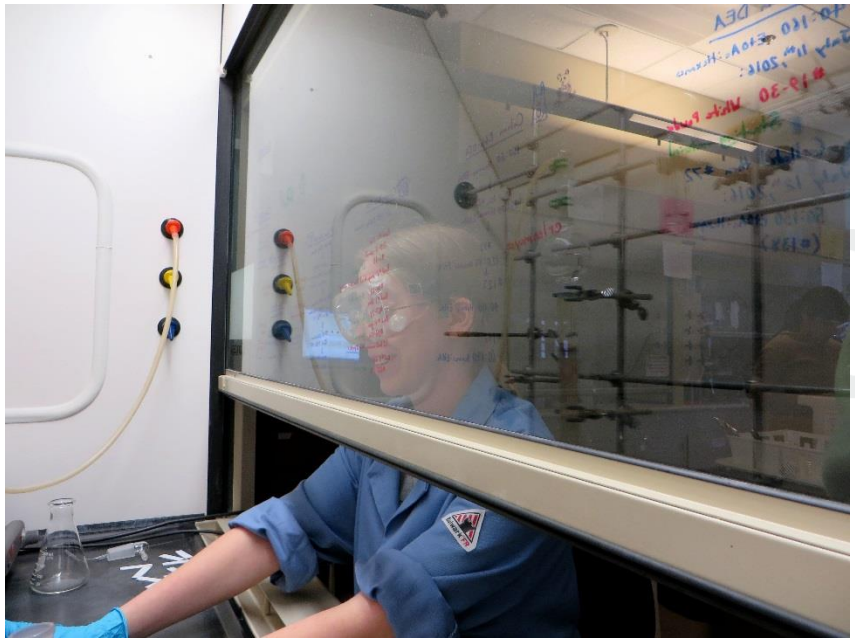
You?

Lab Life

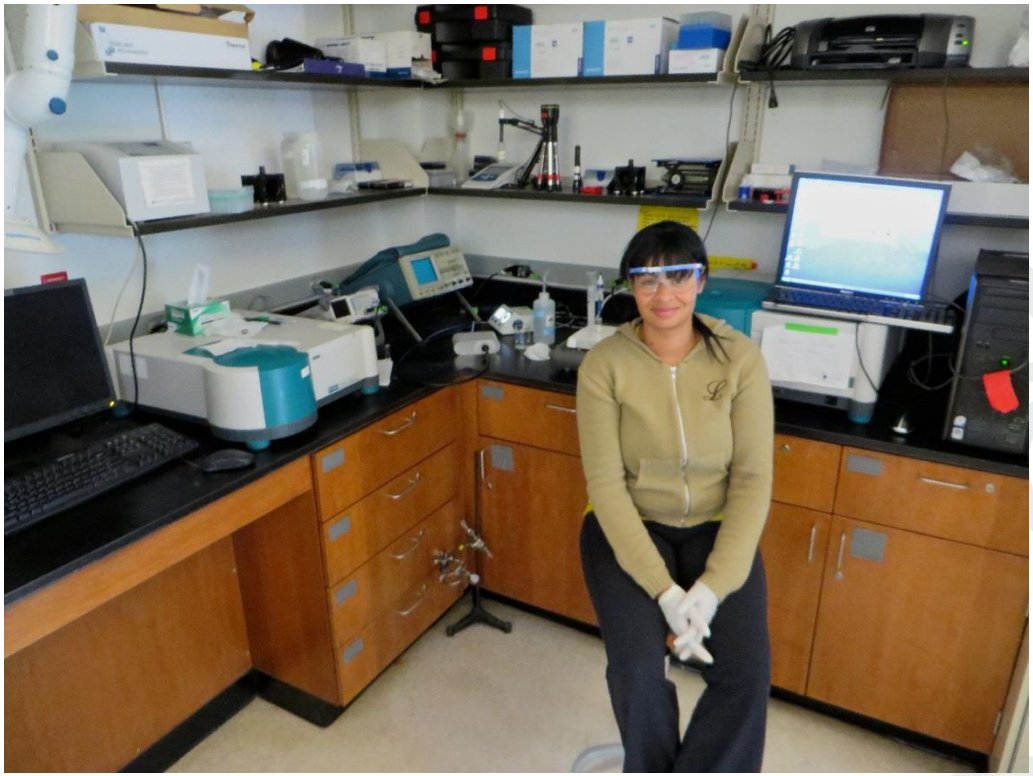


Making



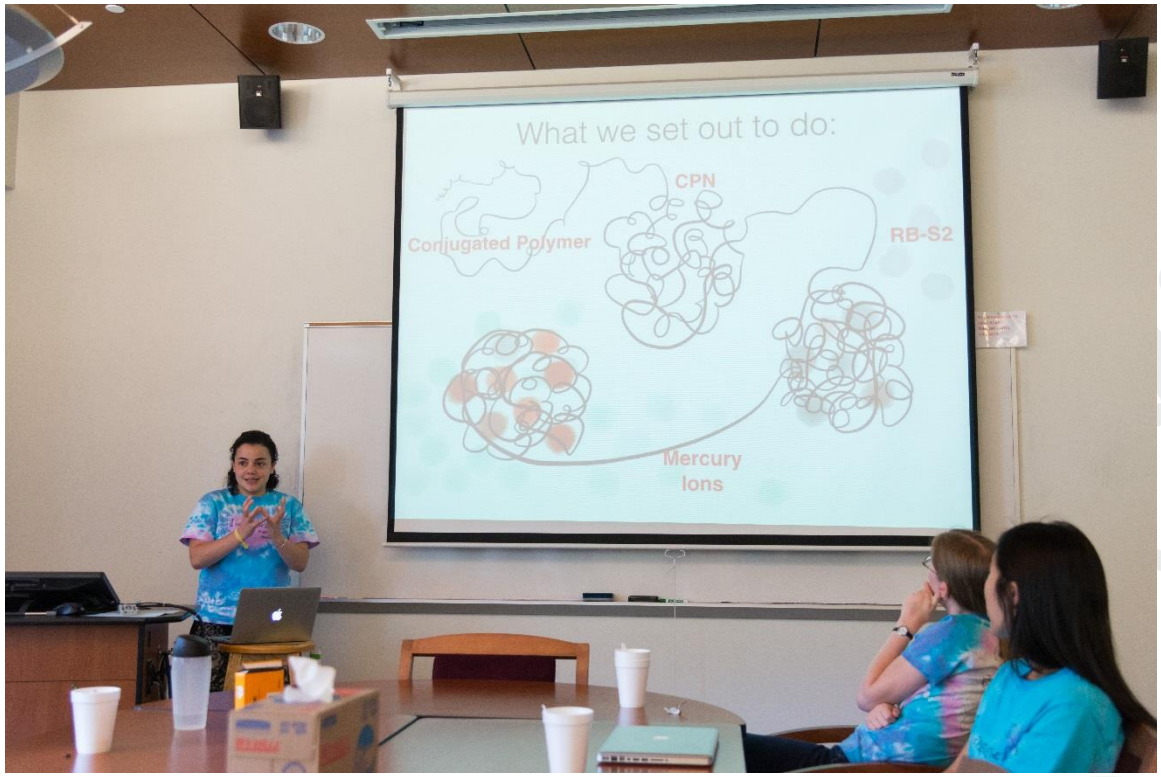
- Organic synthesis
- Purification (chromatography)
- Characterization (NMR)
- Nanoparticle preparation

Measuring



- Absorption and fluorescence
- Response to stimulus (we have lights! lasers!)

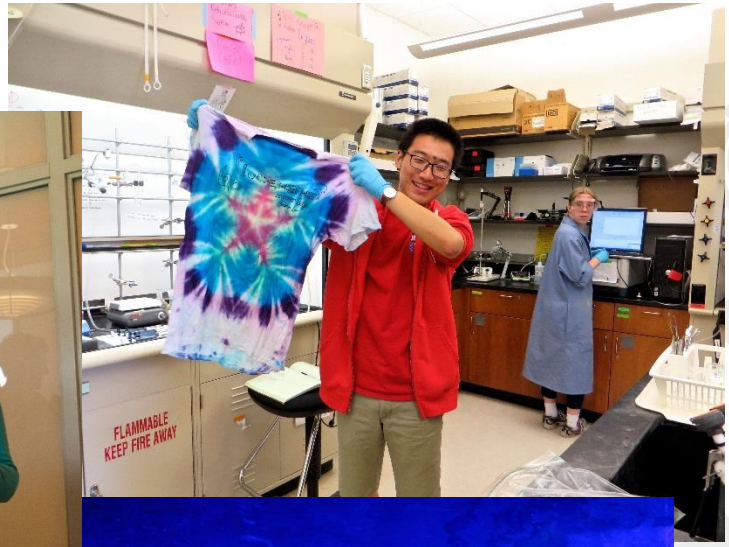
Communicating



- Group meeting
- Undergraduate research symposium

#labhood


Schrodinger's
Kitty Litter Crunch


FLAMMABLE
KEEP FIRE AWAY