Organic Photochemistry with the Harbron Group
Photochemists use light…

• to do chemistry

[Image of chemical reaction]

• to interrogate molecules

• or to do both

[Graph showing absorbance vs. wavelength with pre-irrad., post-UV irrad., and post-VIS irrad. curves]

[Graph showing normalized intensity vs. wavelength with pre-irrad., post-UV irrad., and post-VIS irrad. curves]
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)

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

You?
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