Mentor's Name | Dr. Frank A. Norris  
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Research Subject Area | Photodynamic effect, laser-mediated therapies and teaching lab development

A. **Briefly describe overall research program at your laboratory.** I am developing methods for evaluating compounds for their potential for photodynamic effect based therapies for the treatment of cancer and infectious disease.

B. **Briefly describe specific project(s) for your teacher:** Non-toxic light absorbing compounds when excited with laser light can transfer energy to molecular oxygen and produce highly toxic reactive oxygen species (ROS). This phenomenon is called the photodynamic effect (PDE). As this toxic effect is limited to location of laser illumination, PDE based therapies can be treat tumors and infections without harm to surrounding healthy tissue. With the help of a recent undergraduate student interested in education, we have recently begun to develop methods suitable for high school and undergraduate teaching labs that can used to a develop greater understanding of light, energy, oxidation, and cell structures. These methods use low-power red lasers, student-friendly cells (sheep red blood cells and baker’s yeast) and a non-toxic model compound, methylene blue. We would benefit from a collaboration with a teacher this summer to help us develop these methods for teaching laboratories.

C. **Will any other people (post docs, grad students, undergraduate students, colleagues, etc.) be involved directly with your teacher?** The teacher would work with me and possibly a high school student.

D. **Will you require any advanced reading/preparation for the teacher? If yes, please briefly describe.** Yes, the teacher would read about photodynamic effect based therapies for cancer and infectious disease.