# Erin R. Neely

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## Objective

I aim to be the best physics student I can be, so that someday I can apply my skills to research (and training the next generation of researchers) that will solve the scientific and practical problems we face.

## Education

### Emory University, August 2017--May 2021

- BS in Physics with honors (projected)
- BA in Philosophy (projected)
- AA from Oxford College of Emory University
    - Oxford College is a branch campus where about ⅛ of Emory students begin their education. It is meant to provide a smaller, more intimate environment for a liberal arts education within a large research university.
- GPA 3.95
- Major GPA 3.82

## Research Experience

### Student Researcher, Emory University, May 2020--April 2021

- Presently conducting original research in experimental and computational biophysics under the direction of PI Dr. Kurt Warncke and his graduate student Wei Li
- Investigating the behavior of beta-casein, an intrinsically disordered protein, to see how it compares to previously-studied ordered proteins
- Analyzing data from EPR studies done with proteins and spin probes
- Running simulations of system behavior on Matlab in order to find a model of best fit for experimental system behavior
- Will present work to the Conference of Undergraduate Women in Physics in January
- Will present a report to the Honors Committee in April

### Young Scientist, Washington University in St. Louis, June-July 2016

- Worked as a Summer Focus Scholar under graduate student Vivian Lee
    - Performed 40 hours of research per week, for 8 weeks
    - Took a class in technical writing and presented work orally to the program supervisors
    - Project investigated a mouse model of the M292R mutation in the *Lox* gene, which causes aortic aneurysms and early death
- Abstract of project:
    - The M292R mutation in the lysyl oxidase gene *Lox* is one of many known causes of familial aortic aneurysm (FAA). Ordinarily, lysyl oxidase (LOX) is secreted from the cell to cross-link collagen and elastin in the aortic wall. However, the protein product of the M292R mutation

(mLOX) is not properly secreted from the cell, leading to FAA. Antibody staining of elastin in the aortic walls of wild-type ($Lox^{+/+}$), heterozygous mutant ($Lox^{+/M}$), homozygous mutant ($Lox^{M/M}$) and homozygous knockout ($Lox^{-/-}$) mice revealed that $Lox^{M/M}$ mice have disorganized elastin globules similar to those of $Lox^{-/-}$ mice, and $Lox^{+/M}$ mice have fragmented elastin sheets as opposed to the stable elastin sheets of $Lox^{+/+}$ mouse aortas. Antibody staining of LOX and the various organelles in its secretory pathway revealed that mLOX does aggregate inside the cell, but not in the Golgi apparatus. Similarity between mLOX and ER patterns in LoxM/M cells strongly suggests that mLOX is not properly transported out of the ER. However, further testing is needed for a definitive conclusion.

# Teaching Experience

## Tutor, Oxford College of Emory University, August 2018--May 2019

- Helped students in the introductory class with their homework problems
- Held review sessions before exams
- Worked once or twice a week for a couple hours, depending on when the students needed me
- Learned how to explain physics concepts to those who may struggle, and to walk people through problem-solving

## Lab Assistant, Oxford College of Emory University, August 2018--May 2019

- Helped students in the introductory classes work through their labs
- Became familiar with the applicable lab equipment each week and met with instructor to brainstorm solutions to likely problems
- Learned how to troubleshoot equipment/experiments and teach others to do the same

# Honors and Awards

- Phi Beta Kappa honor society
- U.S. Presidential Scholar
- Oxford Dean's List
- Outstanding Student in Logic

# Skills

- Programming ability in Matlab and Python
- Experience with computational modeling
- Experience with the IBM quantum computer
- Experience with lab equipment including basic mechanical setups, electromagnetic circuits, interferometers, lasers, and microfluidic chips
- Experience with the Emory University radio telescope
    - Astronomical coordinate conversion (galactic, equatorial, horizontal)
    - Operating the telescope via remote computer terminal
    - Reading and interpreting measurements
- Scientific writing and presentations
    - Commended by program supervisors at the Young Scientist Program
- Fluent in Spanish

# Interests

- Physics in medicine

- Nuclear energy
- Cosmology and relativity
- Quantum mechanics
- Science and society