

From High School to Vision Science

Exploring Careers in the Field

Linjiang Lou, PhD

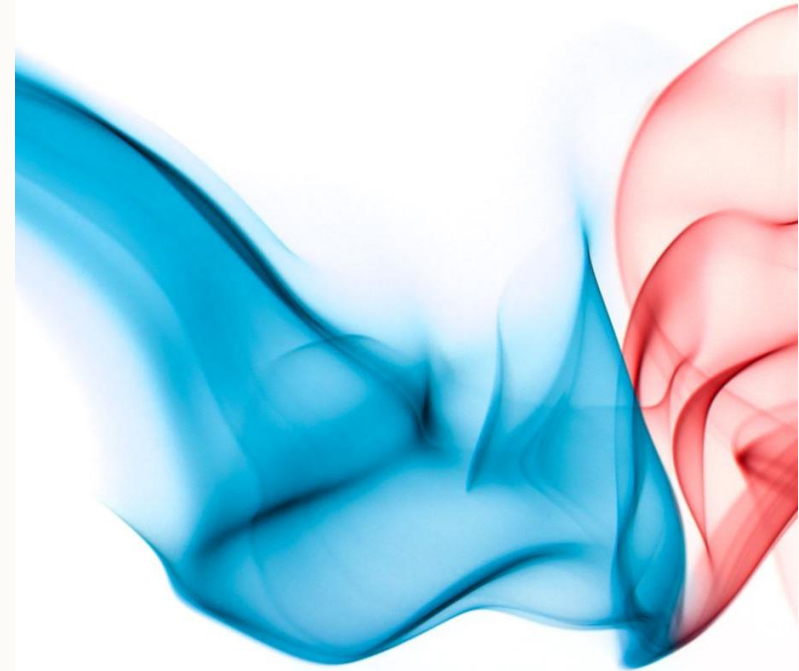
Research Scientist

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Pathway from high school to college

Subjects to take in High School



- Biology
- Chemistry
- Math
- Physics

College Degrees and Majors



- **Bachelor of Science (B.S.)**
 - **Neuroscience**
 - **Biomedical engineering**
 - Physiology
 - Anatomy and cell biology
 - Biology
 - Biochemistry

Courses to take in college

Required courses for most biological science majors

- Cell and molecular biology
- Chemistry
- Calculus
- Physics
- Organic chemistry

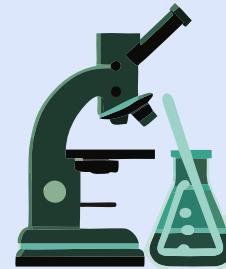
Other required or optional courses depending on the major

- Biochemistry
 - Genetics
 - Neuroscience
 - Physiology
 - Anatomy
 - **Computer science**
 - **Statistics**
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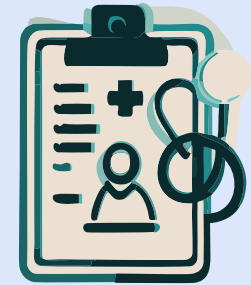
Exploring vision science research in college

- Most college programs have opportunities to conduct undergraduate research for course credit
- Find a lab that does research that interests you
- **Are you interested in...**

**Basic
Science**



**Clinical
Research**



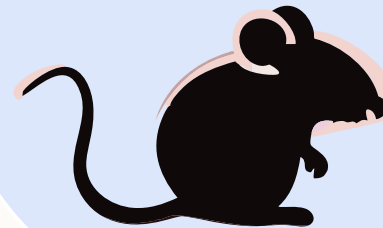
Wet lab



Dry lab



Animals



Humans



Pathway to vision science/ophthalmology after college

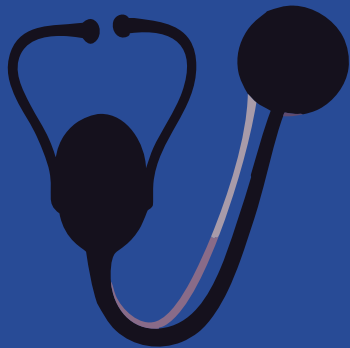
Clinician
Scientist

Research



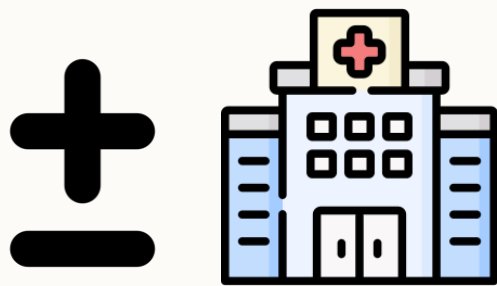
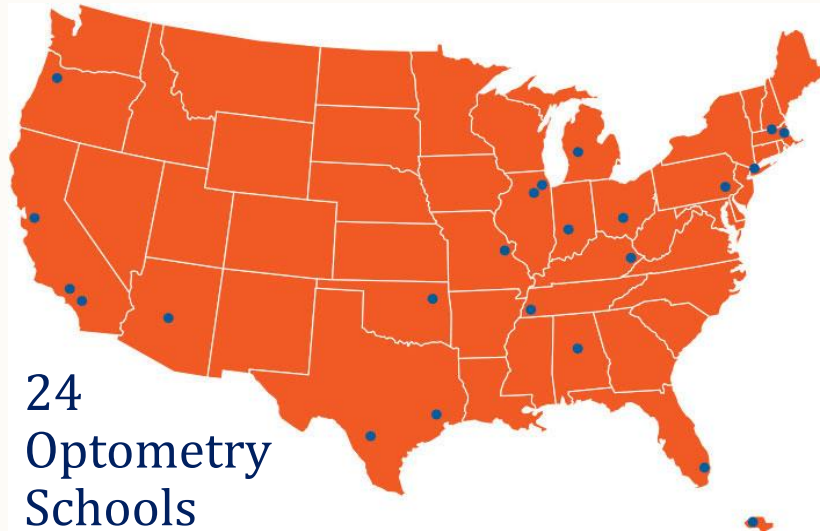
- **Graduate school (M.S. and/or Ph.D.)**
 - Basic research, translational research, clinical research
 - Programs: vision science/physiological optics, neuroscience, biomedical engineering
 - Length: M.S. – 2 years; Ph.D. – typically 4-6 years

Clinician

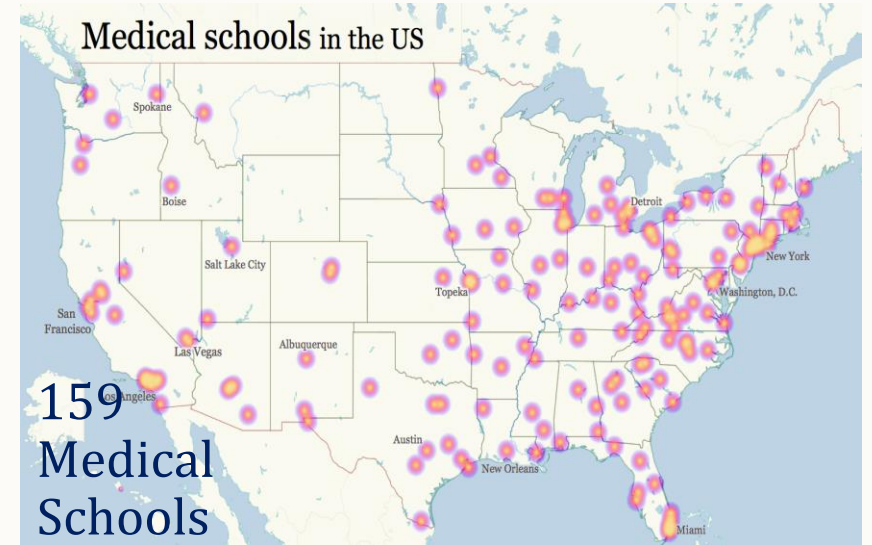


- **Medical school (M.D.)**
 - Ophthalmologist
 - Length: 4 years
- **Optometry school (O.D.)**
 - Optometrist
 - Length: 4 years

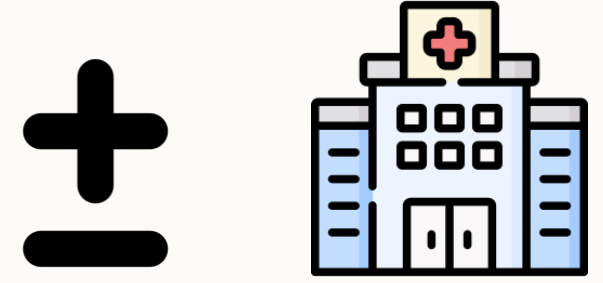
Clinical Careers



Residency: **1 Year**



Residency: **4 Years**



Fellowship: **1-2 Years**

Clinical Careers

Optometry

Eye care professionals

- Vision testing and correction.
- Provide vision therapy and low-vision rehabilitation.
- Monitoring simple eye diseases and referring to ophthalmologists for further management.

Ophthalmology

Eye physicians and surgeons

- All optometrist services +
- Performing eye surgery (cataract surgery, LASIK, etc.)
- Diagnosing and treating complex eye diseases (e.g., diabetic retinopathy, macular degeneration, glaucoma).

Research Careers

Academia



- **Focus:** Understanding of the eye and vision.
- **Work:** Research projects, often focused on a specific area (e.g., why myopia develops).
- **Tasks:** Conducting experiments, analyzing data, writing research papers, presenting findings at conferences (like here at ARVO!)



Industry



- **Focus:** New drugs for eye diseases.
- **Work:** Research and development (R&D) teams, focusing on practical applications.
- **Tasks:** Participating in clinical trials, developing prototypes for new devices, testing the effectiveness of new medications.

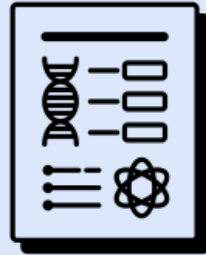


Other Eye-related Careers

Teaching



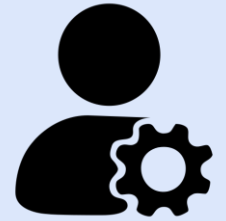
Scientific Writing



Science Policy



Administration



Thank You
