

# Ophthalmology

with Professor Machele Pardue  
and her research team

## Talking points

### Knowledge

1. What is myopia?
2. What are two factors that influence eye growth and myopia development?

### Comprehension

3. Why is light exposure important in refractive development?
4. How are retinal dopamine and retinoic acid involved in eye growth and myopia?

### Application

5. Why do you think collaboration between scientists from different disciplines, such as cell biology, genetics, neuroscience, physiology and engineering, is advantageous for solving problems about myopia development or other eye conditions and diseases?
6. If you had a chance to meet Machele and her research team, what questions would you ask them about their research and career pathways?

### Analysis

7. How does Machele's team use mouse models to investigate the mechanisms behind myopia development? What are some advantages and disadvantages of using mouse models in research?
8. What has Machele's lab discovered about retinal and scleral mechanisms in myopia, and how do you think these findings have advanced the research field?

### Evaluation

9. Why do you think it is important to understand the underlying mechanisms of a disease? How does it help scientists to develop treatments for the disease?
10. Machele's research team consists of scientists with different research backgrounds and expertise. What do you think are the opportunities and challenges of exploring different research fields? To what extent would you want to explore different research fields?

## Activity

### Test your vision!

Are you myopic (near-sighted) or hyperopic (far-sighted)? Do you have 20/20 vision? The term 20/20 vision means that, when standing 20 ft from an eye chart, you can read what the 'average' person can read at that distance.

You can test your own eyesight by printing an eye chart, sticking it to a wall, standing 20 ft (6.1 m) away, and seeing which sized letters you can read.

Design and conduct an experiment to explore the range of vision among your classmates. What is the average vision in your class? How many people are myopic and how many are hyperopic? If necessary, how do these people correct their vision?

You can download a printable eye chart, and find eyesight-related activity suggestions, at [www.teachengineering.org/activities/view/cub\\_human\\_lesson06\\_activity1](http://www.teachengineering.org/activities/view/cub_human_lesson06_activity1)

## More resources

- The NEI has fun resources and videos to learn about the eye and vision: [www.nei.nih.gov/learn-about-eye-health/nei-for-kids](http://www.nei.nih.gov/learn-about-eye-health/nei-for-kids)
- Find more resources about myopia and current myopia treatment options: [www.mykidsvision.org/en-US/knowledge-centre](http://www.mykidsvision.org/en-US/knowledge-centre)
- The American Academy of Ophthalmology provides information about eye health and eye diseases: [www.aao.org/eye-health](http://www.aao.org/eye-health)
- Learn more about the ophthalmology research being conducted at Emory University School of Medicine: [www.med.emory.edu/departments/ophthalmology/ophthalmic-research](http://www.med.emory.edu/departments/ophthalmology/ophthalmic-research)