

Microscopic BioArt

Zara Jaffe and Dr. Jamel Ali

Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering

Introduction

- BioArt is a movement that combines biology and artistic expression.
- It uses tissues at their root to present new mediums and types of art at its most basic expression.
- Microscopic BioArt specifically delves into the small aspects of organisms and draws out the beauty of what is not conventionally considered so.
- In this project, a _____ microscope attached to a Nikon camera is used to capture high-resolution images. These are then altered with various platforms such as DaVinci Resolve and Adobe Design to add color and visually appealing depth. The aim of this project specifically is to draw out the beauty of the eyes of mammals, letting viewers contemplate the line between art and biology.

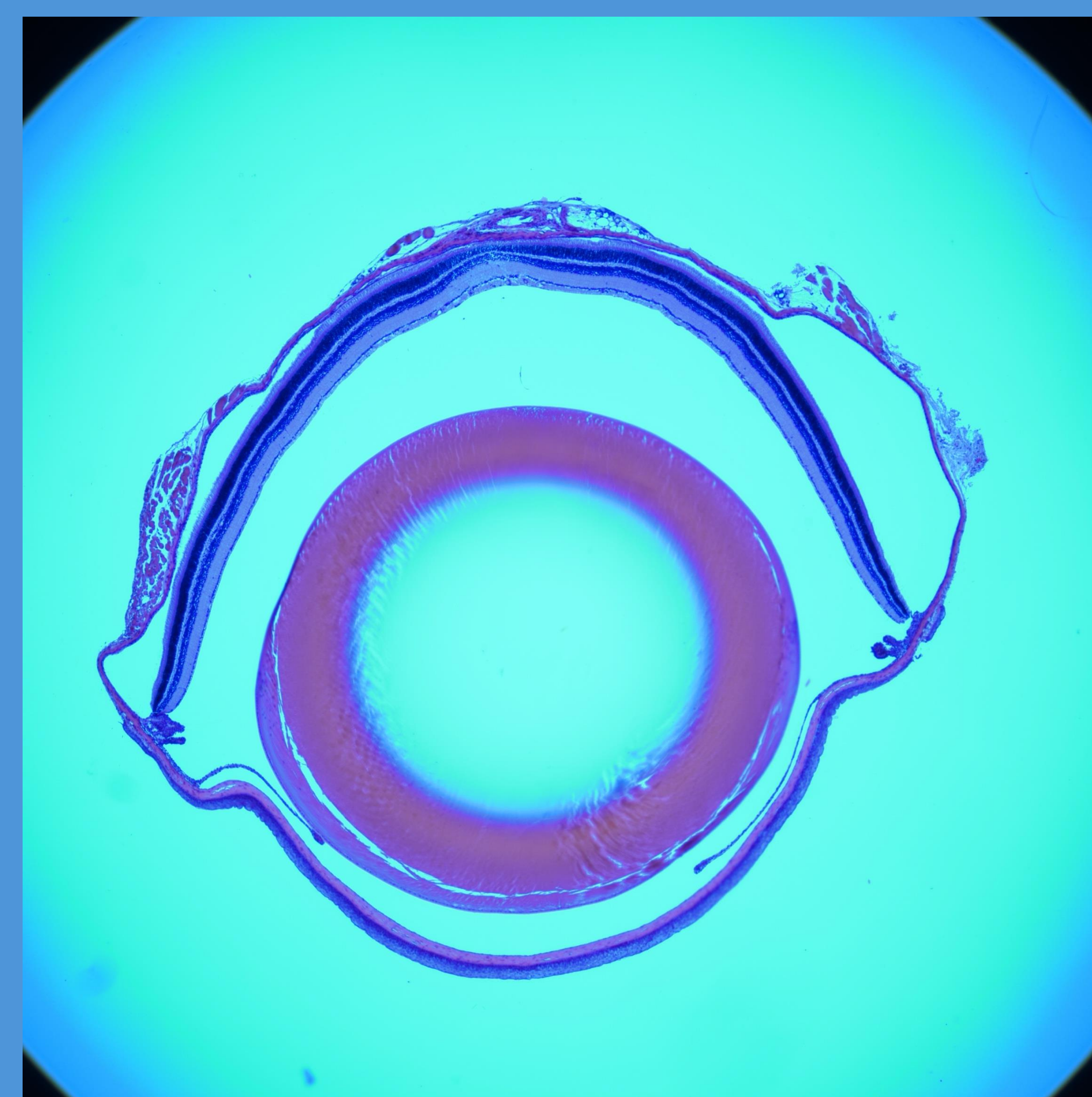
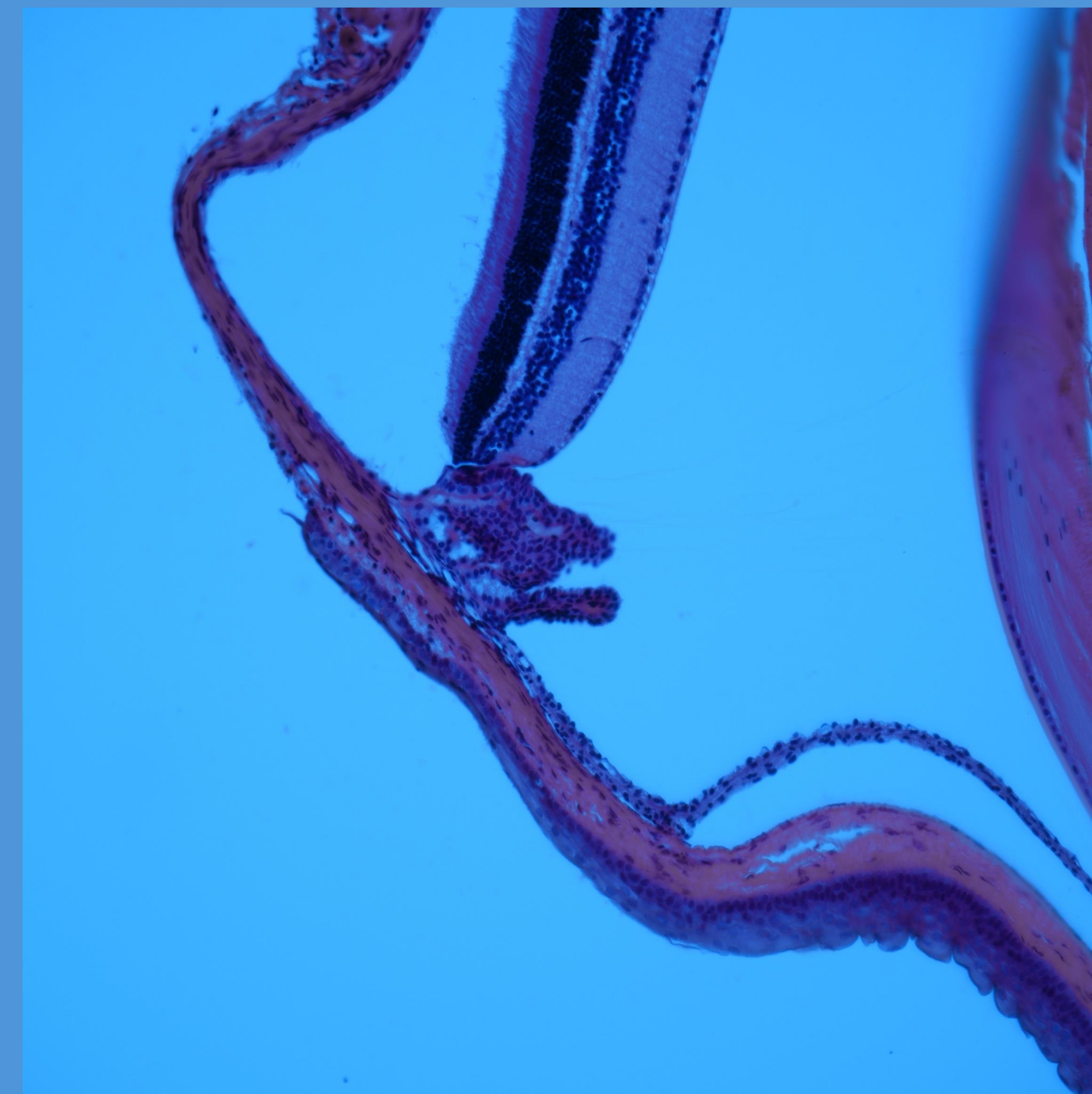
Methods

The “subject” of this study are biological samples. Specifically, looking at Mammal Eye Medium. Using an Electron Scanning Microscope with a Nikon Camera attachment we will:

- Sample Selection: Samples are selected due to the complexity and lack of knowledge surrounding mammalian eyes.
- Microscopy Setup: An Electron Scanning Microscope is equipped with a Nikon camera, allowing photos to be taken of the samples. Magnification levels are raised to achieve more in-depth, visual components.
- Capturing the Image: Images are taken under various lightfields.
- Image Processing Software: Using image processing software, the saved images are then processed and enhanced more. Through this process, we achieve a final image depicting the unknown beauty of a sample.
- Selection: For submission, we evaluate which images are most clear, impactful, and compelling. These are then prepared accordingly for Nikon Small World Competition submission.

The primary form of analysis conducted is qualitative visual analysis. By identifying which settings on an SEM created the most visually compelling images, which image processing software enhanced such, and the relationship between sample and artistic interpretation, we identify qualitatively which images are submitted to the Nikon Small World Competition.

Images



Results

- Top row: Mammal Eye Medium, Brightfield, 20x Magnification
- Bottom row: Mammal Eye Medium, Brightfield, 4x Magnification, taken on Nikon Ni-U Camera
- This explores microscopy through various forms of digital photography – specifically the study of the eye within a mammal.
- The Nikon Ni-U Camera proved more efficient in capturing these images and transferring them from the microscope to image.
- This demonstrates how interdisciplinary studies of arts and sciences can promote the interactions between both fields.

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Resources

- Cogdell, Christina. “From BioArt to BioDesign.” *American Art*, vol. 25, no. 2, 2011, pp. 25–29. *JSTOR*, <https://doi.org/10.1086/661966>. Accessed 2 Nov. 2025.
- Yetisen, Ali K., et al. "Bioart." *Trends in biotechnology* 33.12 (2015): 724-734.