

# Microscopic BioArt

Sofia West<sup>1</sup>, Jamel Ali<sup>2,3</sup>

<sup>1</sup>Department of Biological Science, Florida State University

<sup>2</sup>FAMU-FSU College of Engineering

<sup>3</sup>National High Magnetic Field Laboratory

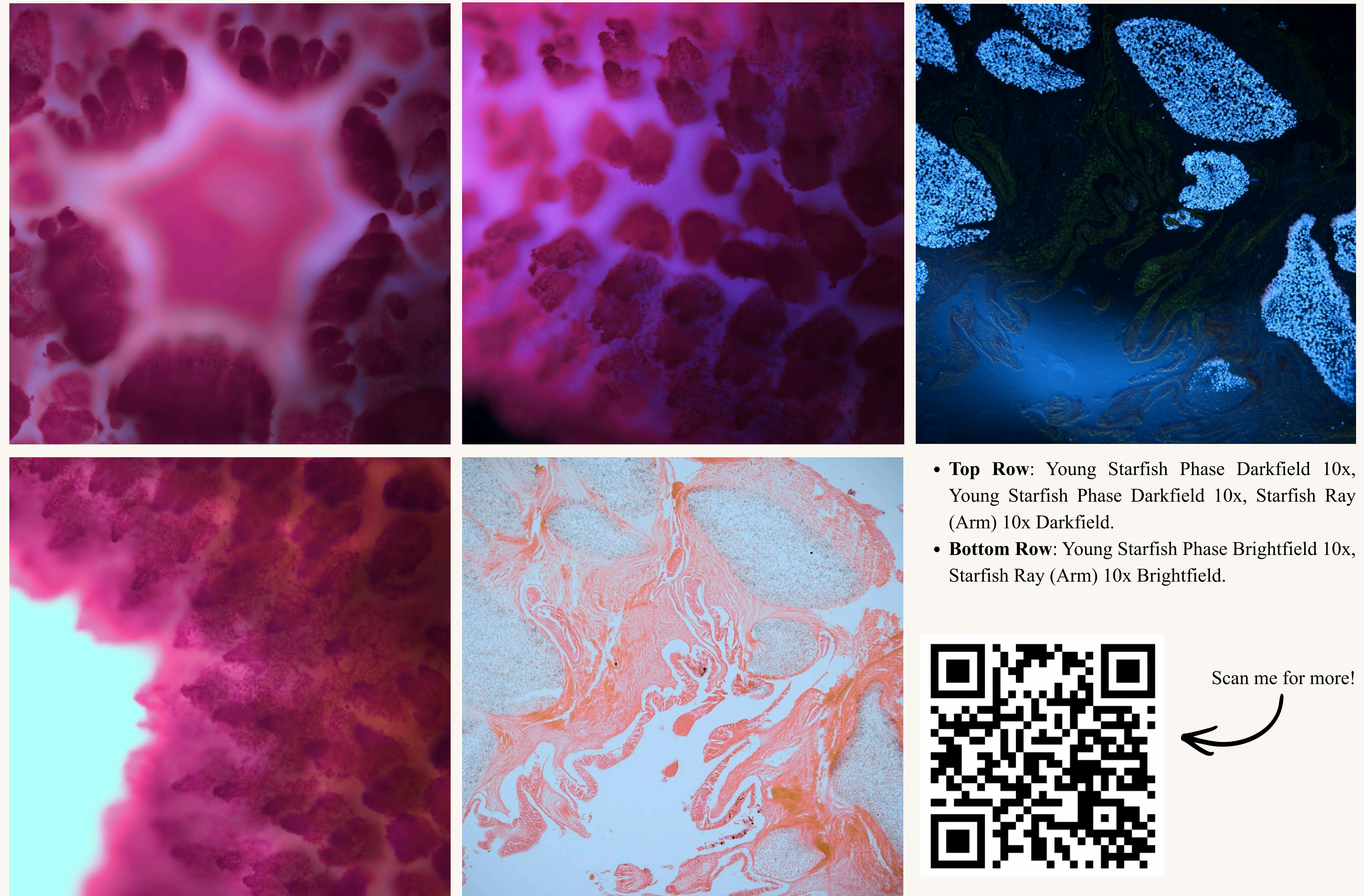
## Background

- **BioArt** - Artistic practice that uses living organisms or biological materials as creative media.
- **Microscopic BioArt** - Artistic presentation of microscopic structures using magnification and digital enhancement.
- Focus of this project: young starfish and starfish ray structures as subjects for microscopic imaging.
- Starfish contain intricate surface textures, skeletal ossicles, and repeating structural patterns that are not visible to the naked eye.
- These microscopic details are often overlooked in traditional scientific images but reveal structural complexity important to marine biology and development.
- **Bright-field microscopy** - Light passes directly through the specimen to produce a clear image against a bright background.
- **Dark-field microscopy** - Scattered light produces a bright specimen against a dark background to enhance contrast.
- Images were selected based on:
  - Structural clarity
  - Surface texture visibility
  - Visual depth and pattern definition
- By combining **microscopy** with **digital enhancement**, this project highlights the hidden structural beauty of marine organisms and presents scientific imagery from an artistic perspective.

## Methods

- Used light microscopy techniques to image young starfish and starfish ray samples.
- Selected either a compound microscope or stereomicroscope depending on specimen size and detail required.
- Visualized specimens using transmitted or reflected visible light and lens magnification.
- Carefully focused and adjusted illumination before capturing images with a mounted microscope camera.
- Applied bright-field or dark-field microscopy to enhance contrast and highlight specific structures.
- Imported images into imaging software for detailed observation, analysis, and measurement.

## Results



- **Top Row:** Young Starfish Phase Darkfield 10x, Young Starfish Phase Darkfield 10x, Starfish Ray (Arm) 10x Darkfield.
- **Bottom Row:** Young Starfish Phase Brightfield 10x, Starfish Ray (Arm) 10x Brightfield.

## References

- “What Is Microscopy?” MyScope Training, Microscopy Australia, [https://myscope.training/Concepts\\_What\\_is\\_Microscopy](https://myscope.training/Concepts_What_is_Microscopy)
- Buiani, Roberta. “Representing the Microscopic: New Ecological Thinking in Art and Science.” Artnodes, no. 13, 2013, <https://doi.org/10.7238/a.v0i13.1997>.

## Acknowledgements

Thank you to Dr. Ali for giving me the opportunity to further explore my passions for biology and art in ways that I had never before considered, to the other research assistants who made the environment positive and welcoming, and to the Undergraduate Research Opportunity Program for this educational experience. All the work was performed at the National High Magnetic Field Laboratory, which is supported by National Science Foundation Cooperative Agreement No. DMR-2128556 and the State of Florida.