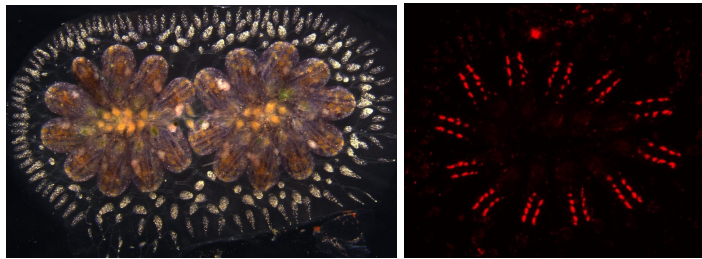


Elucidating the Role of Macrophages during Key Biological Processes in *Botryllus schlosseri*

Shambhavi Singh, Dr. Anthony De Tomaso, Rafael Solorzano

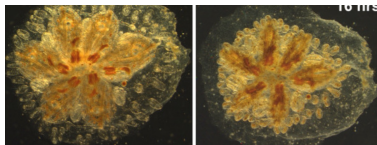
Botryllus schlosseri



- Extracorporeal Vasculature with translucent tunicate that allows for easy, open access of ampullae
- 7-day-long blastogenetic cycle (B.C.) where the animal begins to undergo “takeover,” a process of turning over new zooids, where macrophages are intensely involved
- Ventral **Phagocytic Islands**: primary “staging” area where phagocytes seem to reside on the animal

Hypothesis

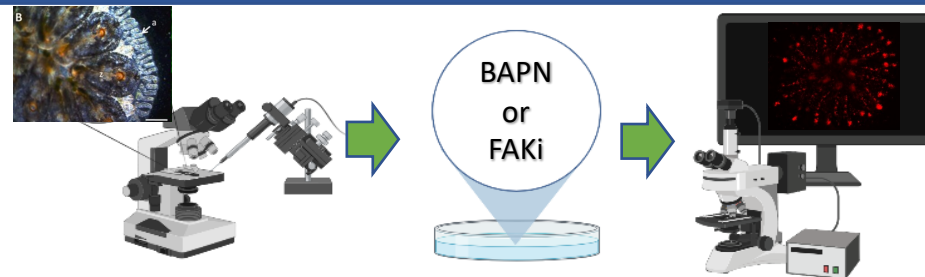
What Role do Phagocytes Play in Vascular Regression?



TIME →

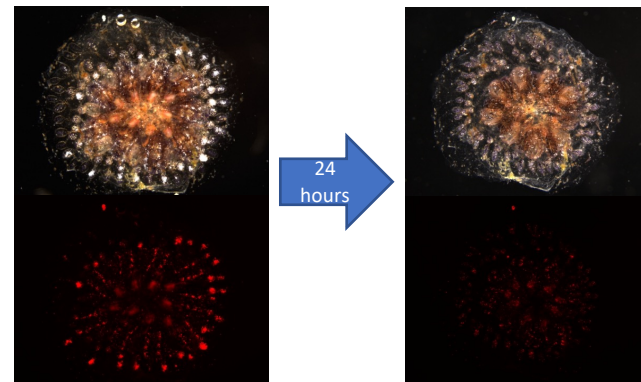
There is natural vascular regression during the later stages of the blastogenetic cycle, and given the heavy phagocytic involvement in this cycle, we would like to further investigate the involvement of phagocytes in the regression of the extracorporeal vasculature.

Methods



1. **Microinjection of pHrodo Red Bioparticles directly into the ampullae of animals that are in early stages of their B.C. : 2uL per system**
2. **Induce Vascular Regression: Put injected animals in BAPN or FAKi seawater solution for 24 hrs**
3. **Darkfield & Fluorescent 24 hour Time-Lapse in solution**
4. **Image injected animals 24 hours after injection**

Results



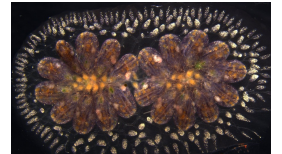
Decreased Density of Phagocytic Islands indicates that phagocytic populations decreased in activity during induction of vascular regression. This was an unexpected result that has been deemed to be due to a mistake in staging many of the animals to be in later stages of their B.C. than they should be. Animals in late stages of their B.C. are focusing all of their energy into development and undergoing “takeover,” so they do not respond well to our induction of vascular regression, or injections of Bioparticles, which is further seen in the increased noise in our fluorescent images.

Moving Forward

~~End of B.C.~~



Start of B.C.



Moving forward, we hope to better stage the animals used, in order to ensure the phenomena observed is due to our induction of vascular regression, and not due to the animals natural B.C.

Acknowledgments

I would love to give an enormous shout-out to Dr. Samantha Davis & Timnit Kefela, from **CSEP**, for making this entire research project a dream come true.

I would also like to thank the entire crew in the **De Tomaso lab** for being incredibly patient, welcoming, and helpful throughout this project. Aside from doing beautiful science, the group truly embodies what it means to be a scientist – doing brilliant work for the sake of being curious.