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# Variability of Grazing by Appendicularians on Prochlorococcus

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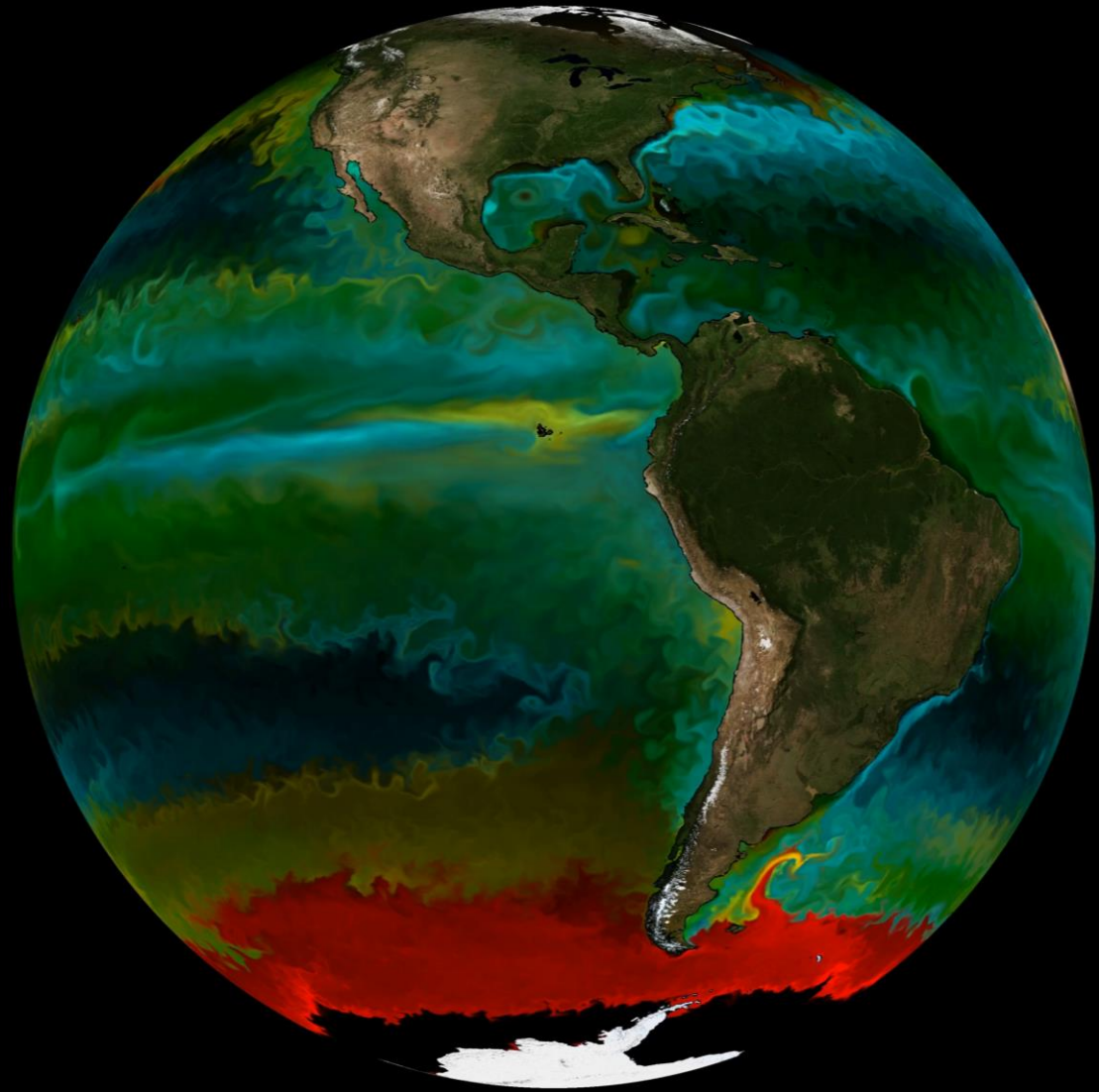
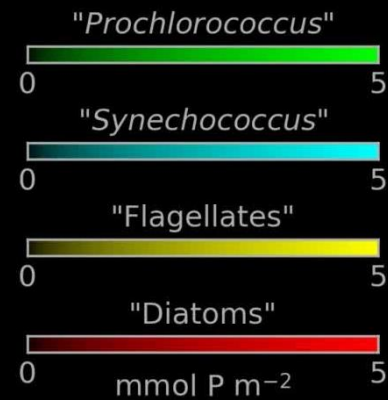
A microscopic image showing a predator, likely a ciliate, with a bright yellow-green body and a long, curved, translucent appendage. The predator is positioned on the left, and its appendage is extended towards the right, where it is consuming a cluster of small, green, spherical cells, identified as Prochlorococcus. The background is dark and out of focus, highlighting the predator and its prey.

# Predation of Appendicularians on *Prochlorococcus*

Carey Sweeney  
Portland State University  
Student Research Symposium  
May 8<sup>th</sup>, 2024

# *Prochlorococcus*

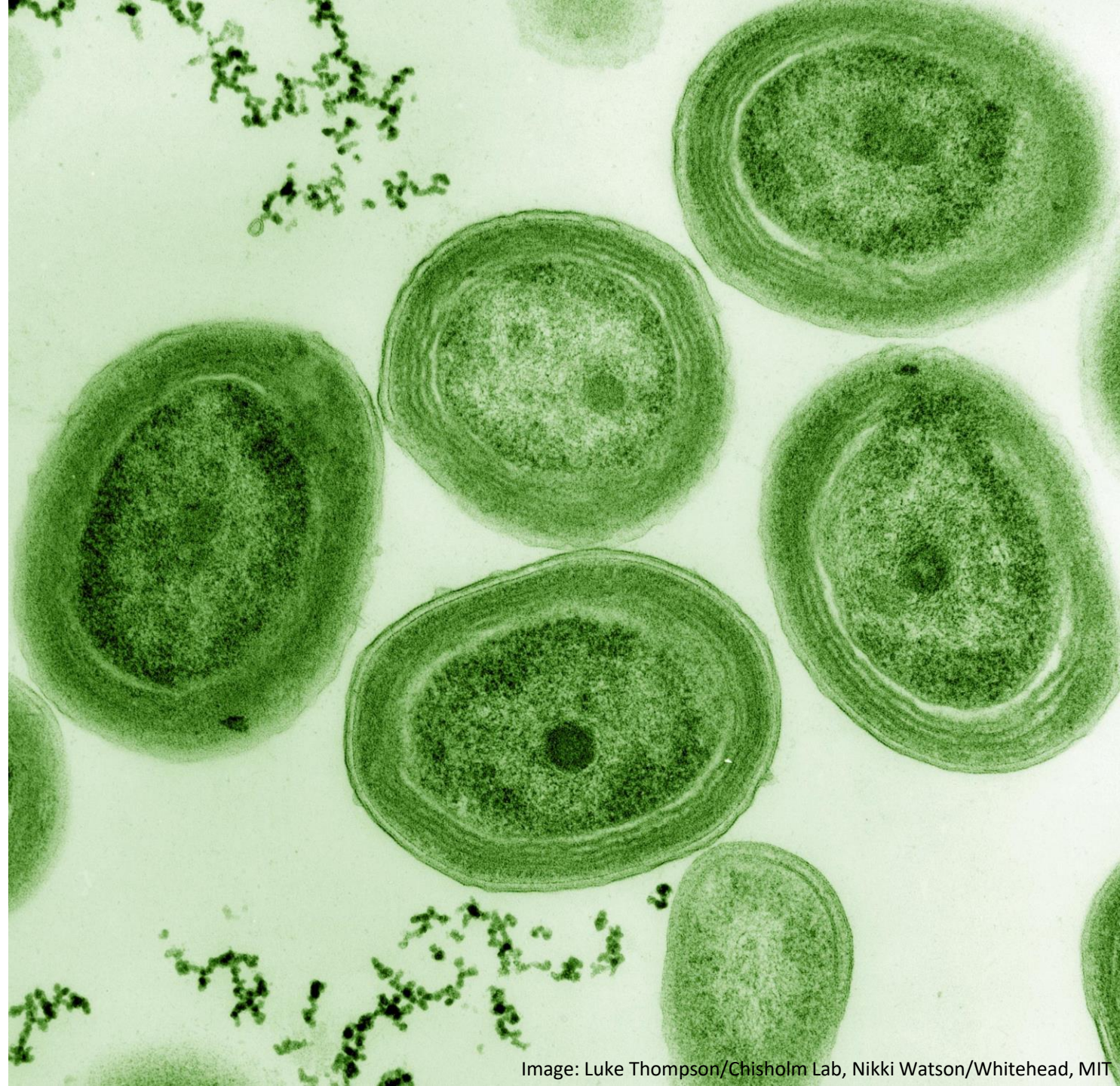
The most abundant photosynthetic cell on Earth



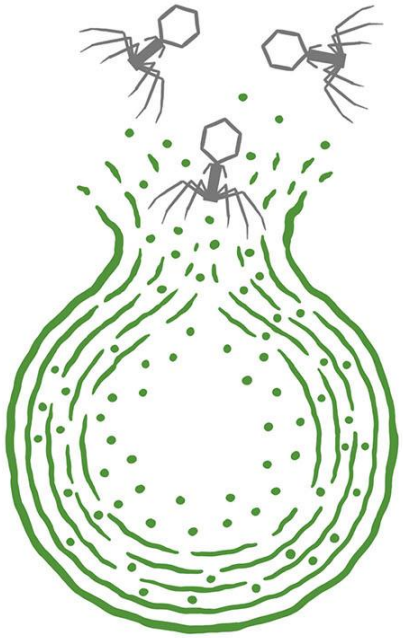


# *Prochlorococcus*

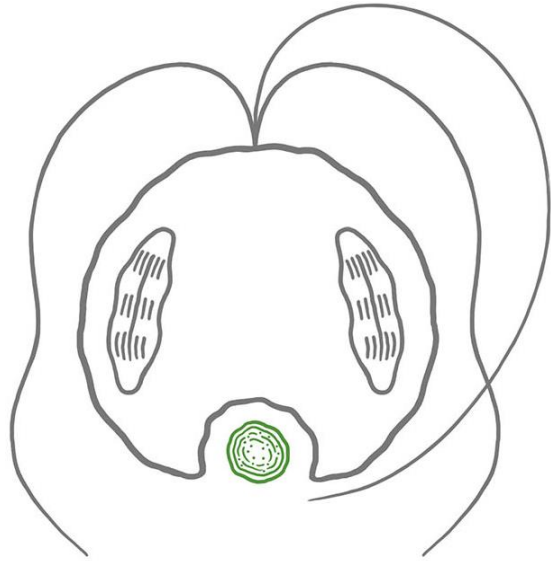
- Growth well-studied
- Loss NOT well-studied



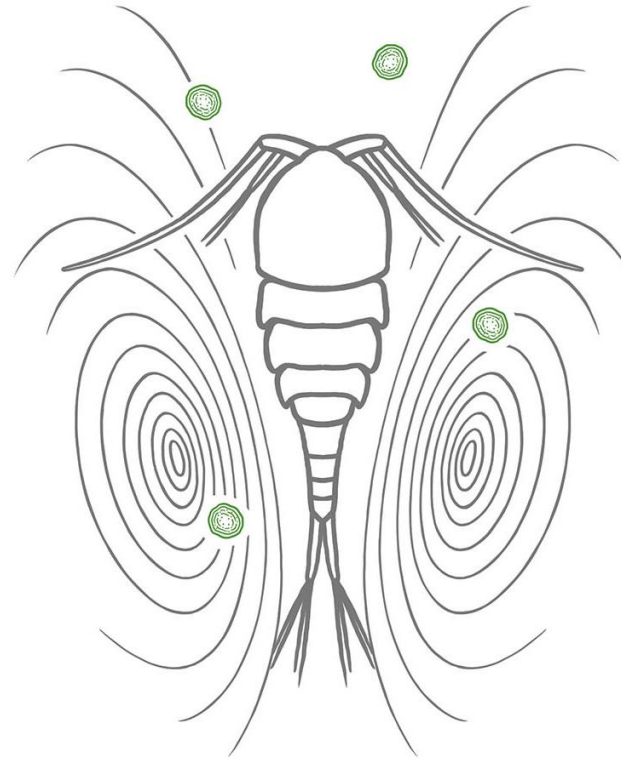
# How Does *Prochlorococcus* die?



Viruses



Protists



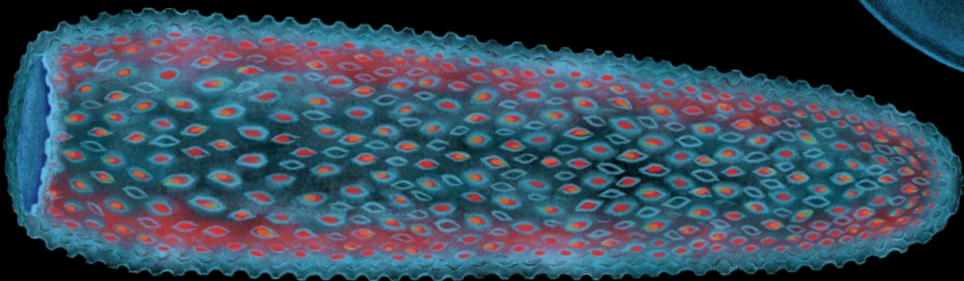
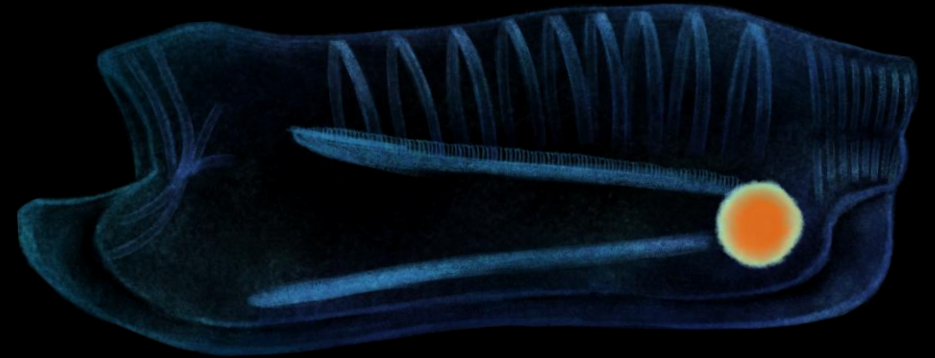
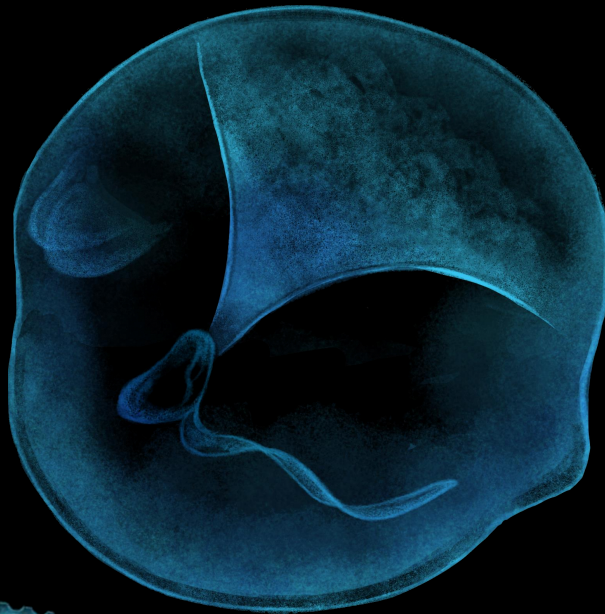
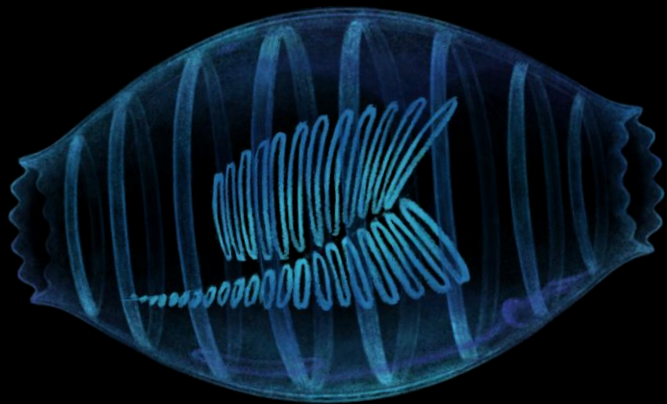
Small Crustaceans



Who else?



# Gelatinous Grazers

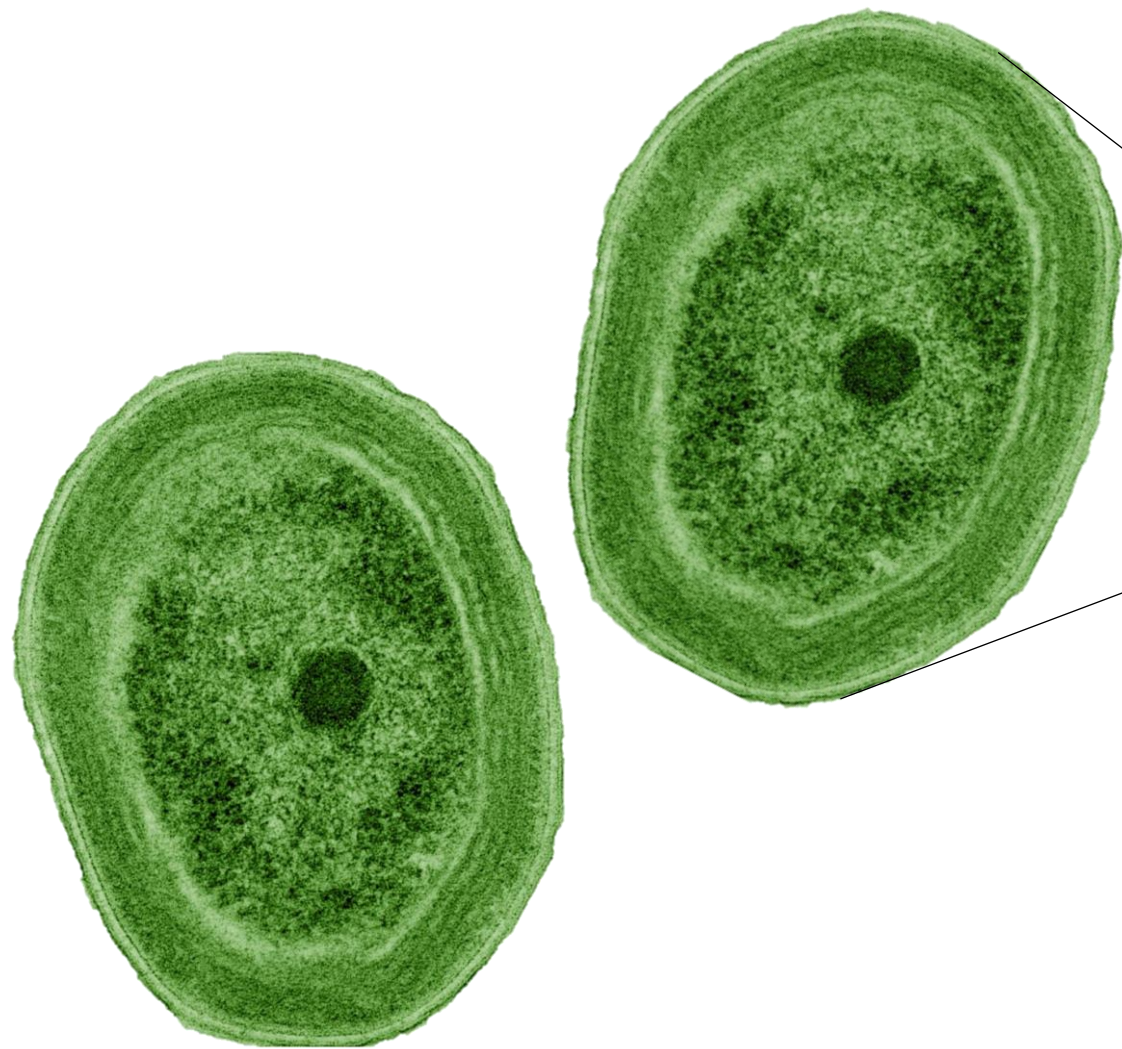


# Appendicularians

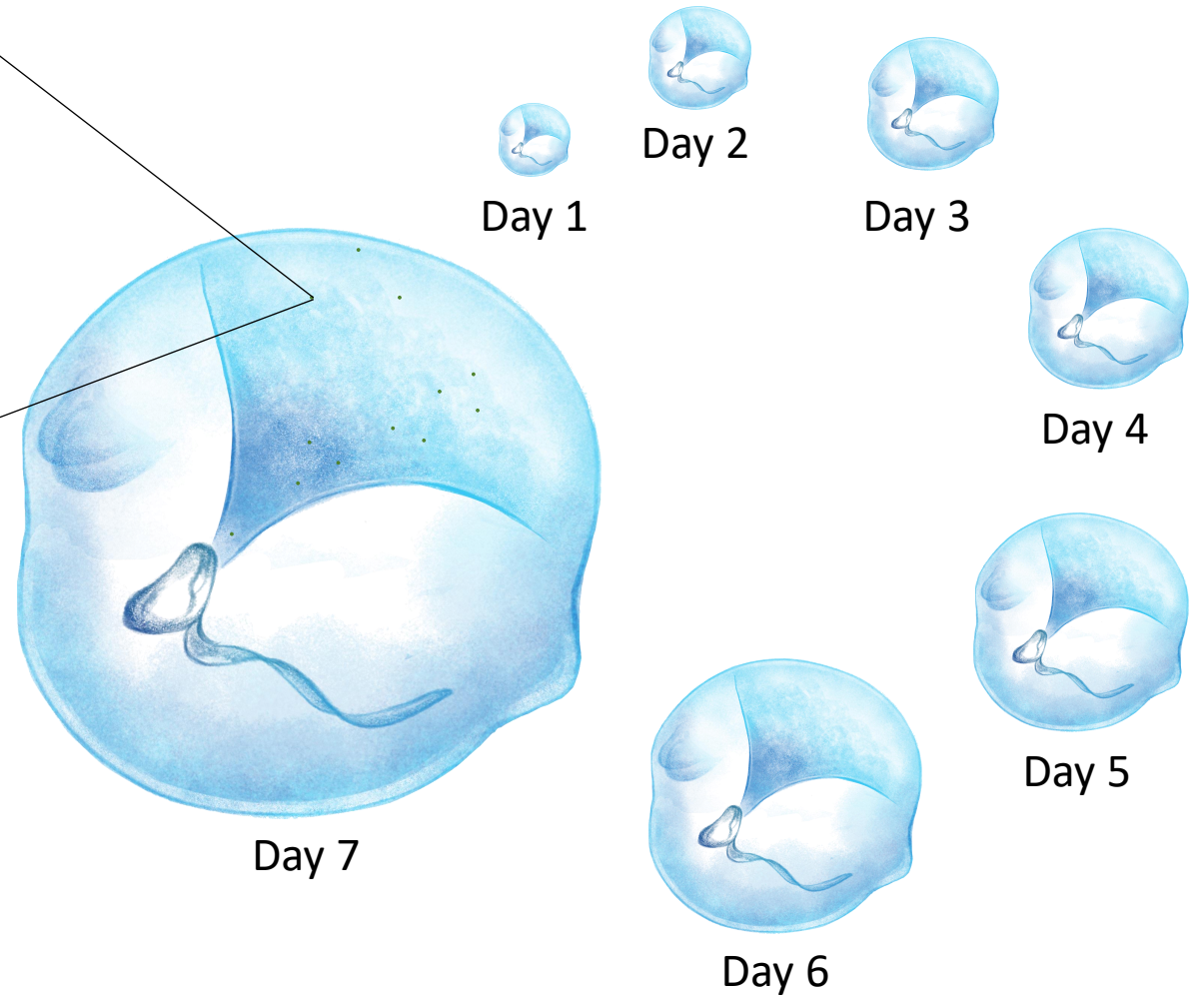
- Ubiquitous
- External mucous mesh
- Discarded houses
- Short life cycles
- Dynamic nutritional demand
- Bloom events





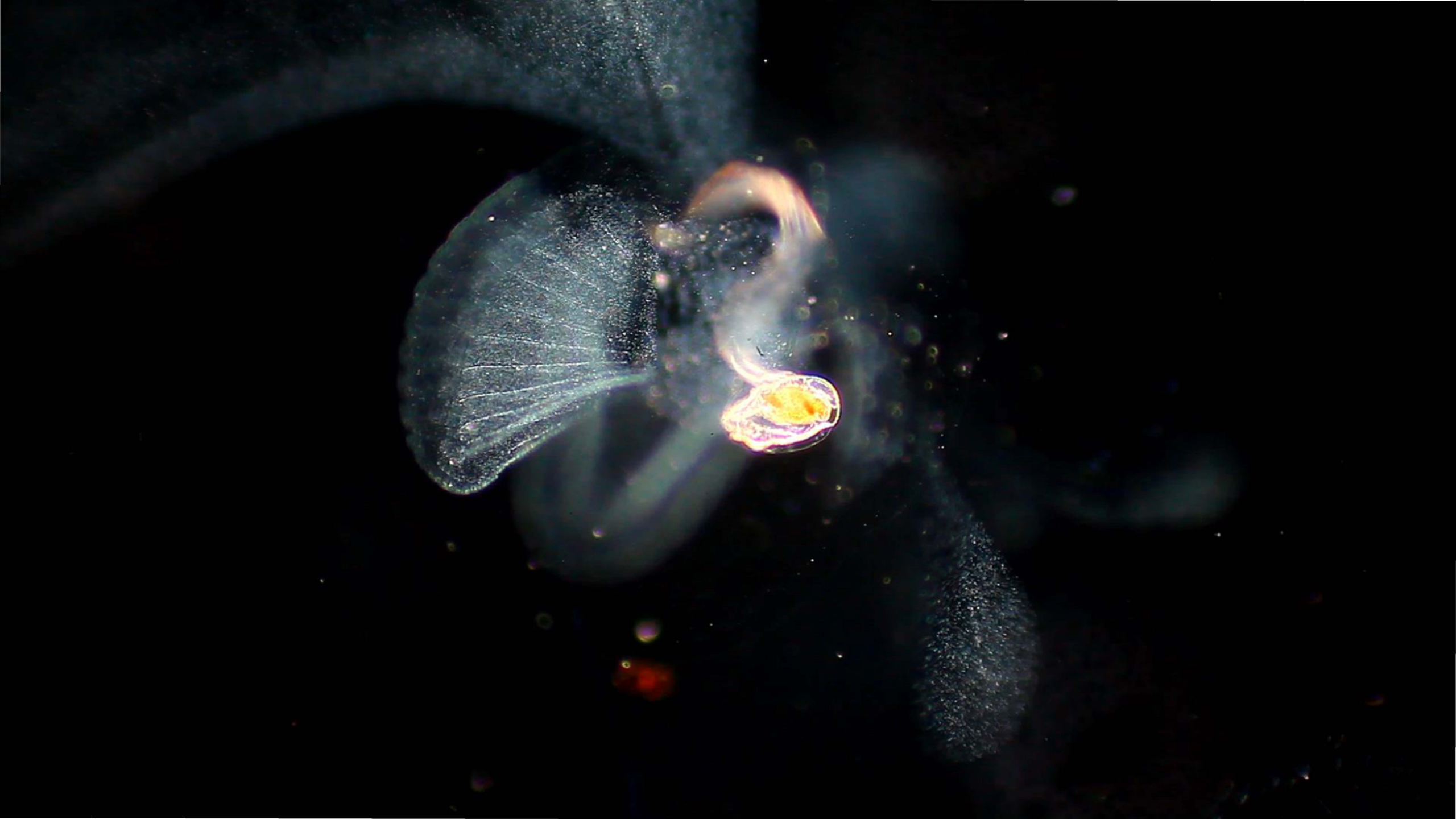


0.5  $\mu\text{m}$



500  $\mu\text{m}$





# Research Questions

1. Does the concentration of *Prochlorococcus* that's available impact grazing rates of appendicularians?
2. Are appendicularian grazing rates different their different life stages?



# Methods

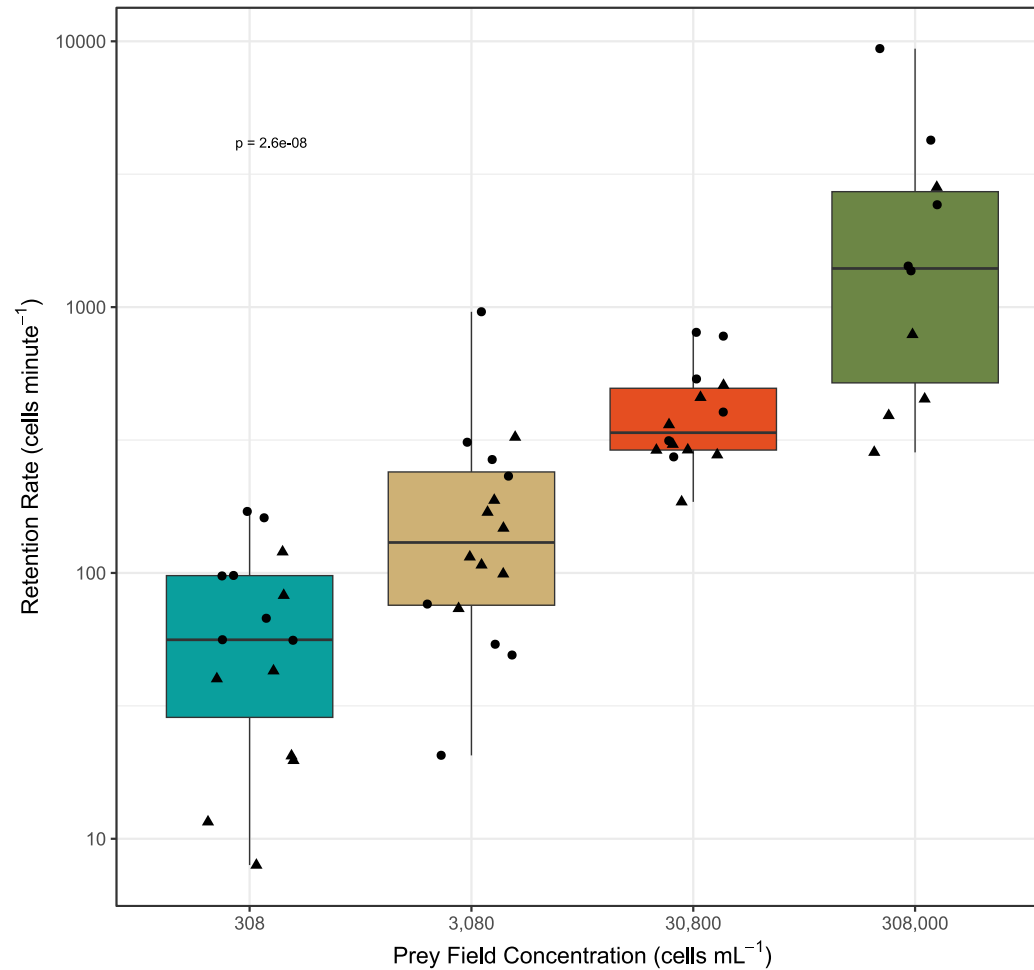
## Appendicularian Incubations

- Lab-cultivated *Oikopleura dioica*
- Prey fields of *Prochlorococcus* MED4
- DNA Extractions (ZymoBIOMICS)
- MED4 *Prochlorococcus* with qPCR
- Data analysis and visualization with R

With Anne Aasjord and Daniel Chourrout at Michael Sars Centre



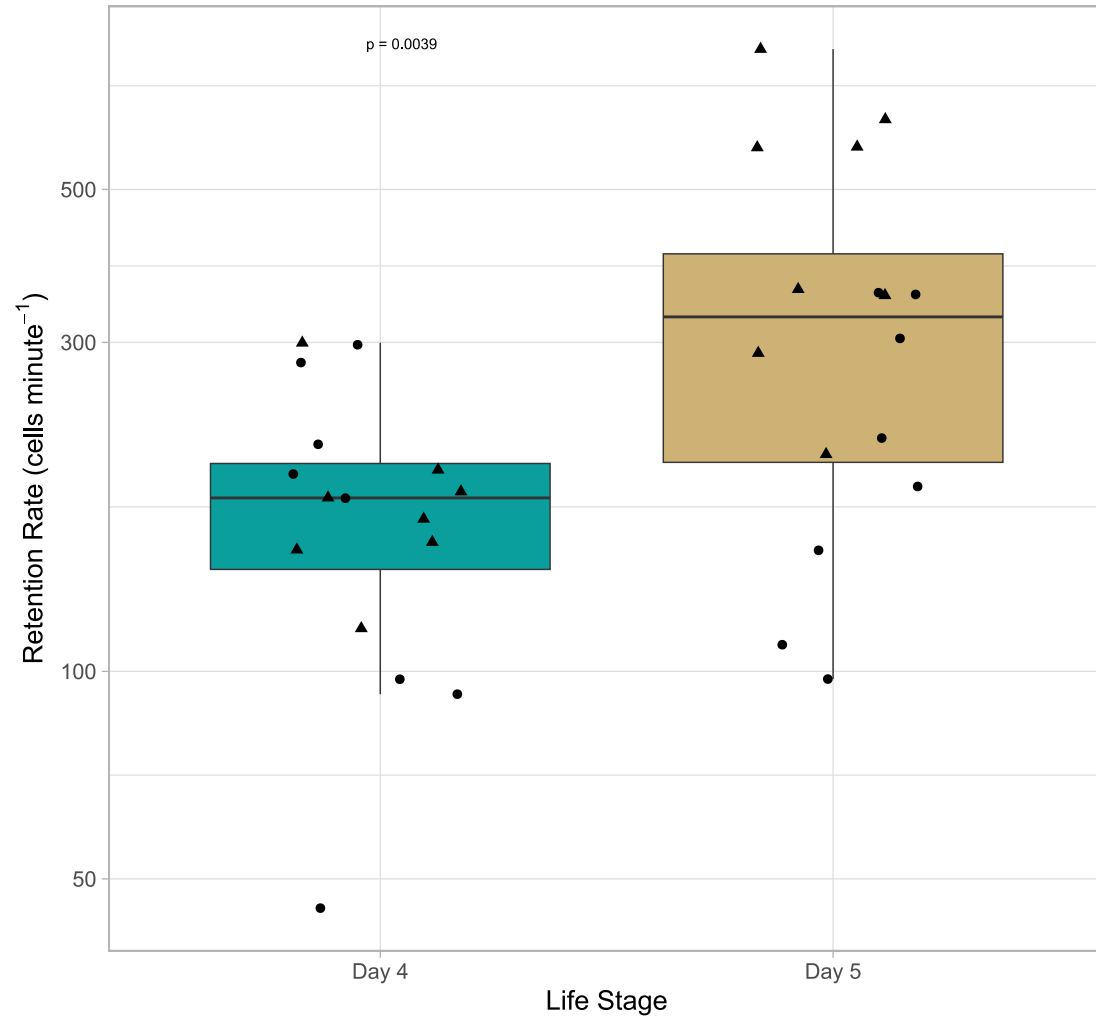
Does the concentration of *Prochlorococcus* that's available impact grazing rates of appendicularians?



- Retain more cells in higher concentrations
- No sign of a maximum retention limit
- Determined numerical relationship
- Ready for model input

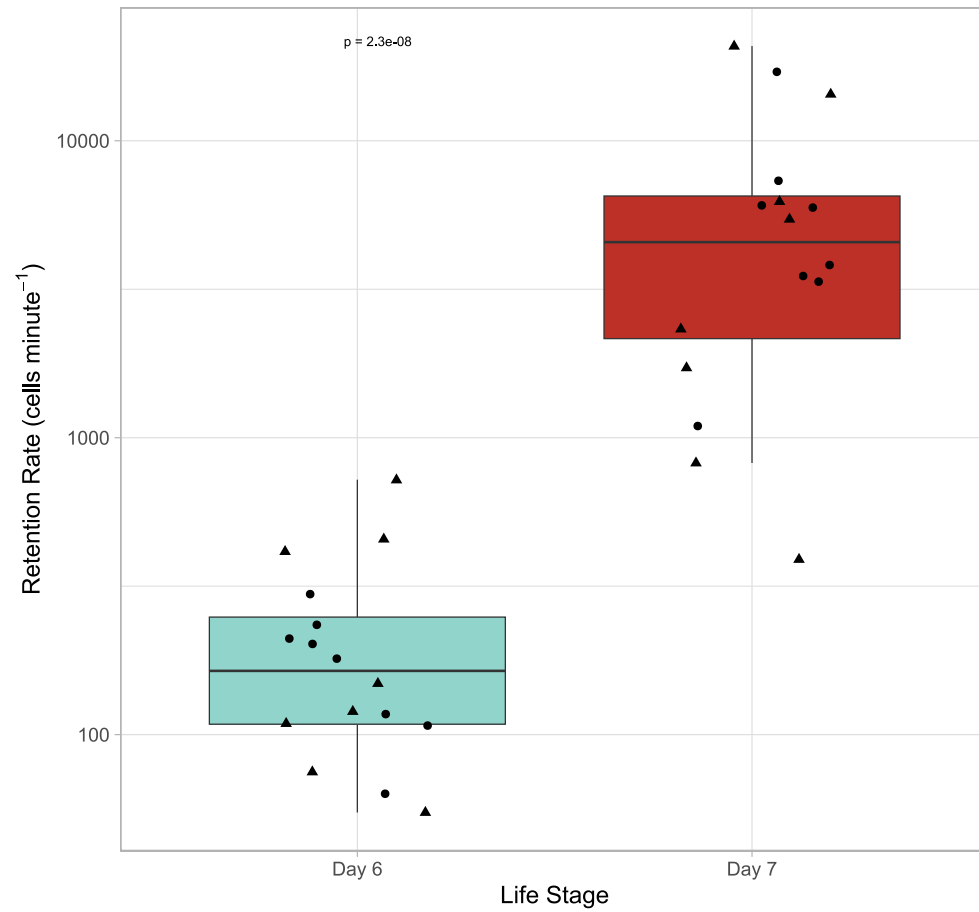


Are appendicularian grazing rates different their different life stages?



- Difference in grazing between D4 and D5 life stages

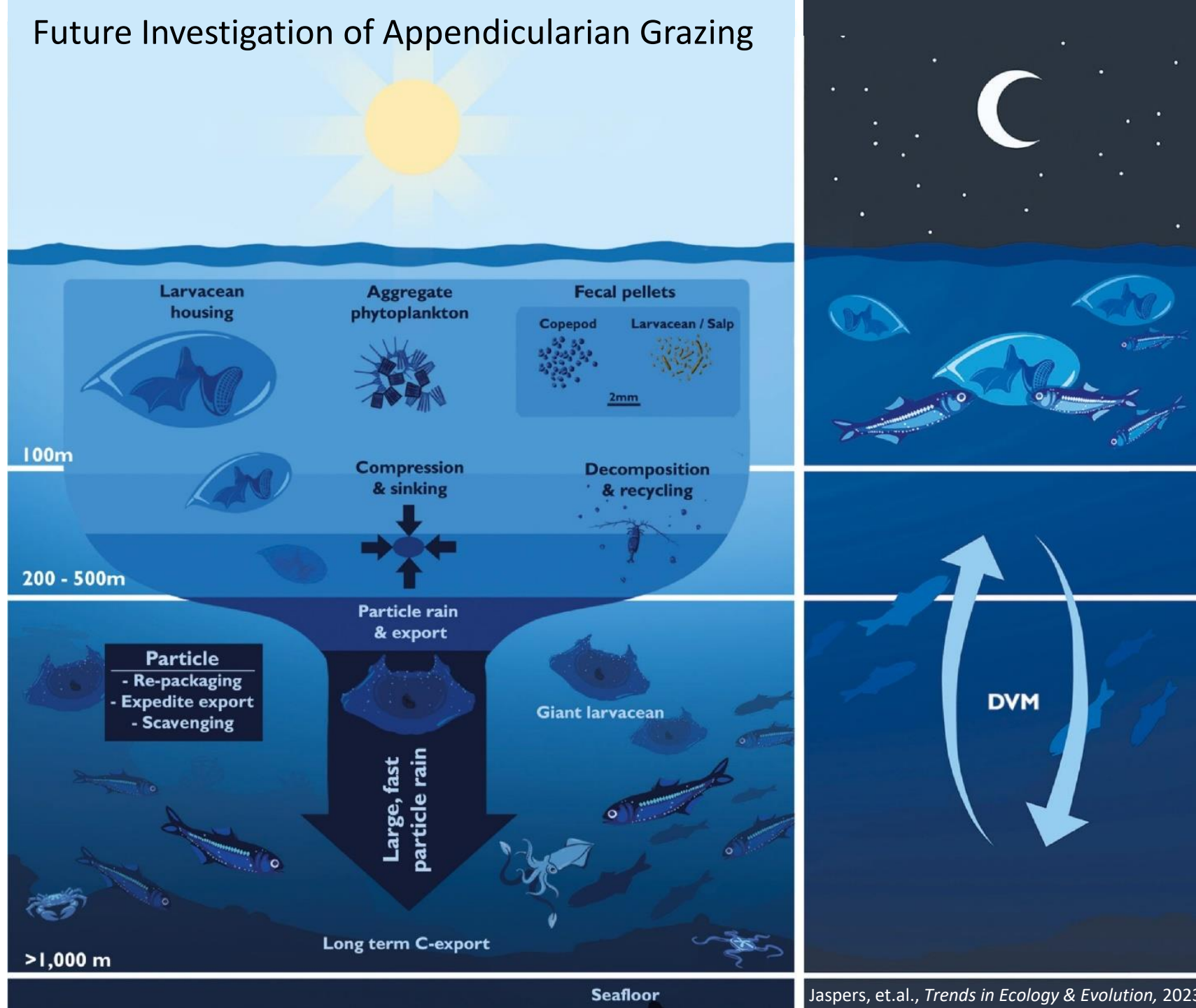
Are appendicularian grazing rates different their different life stages?

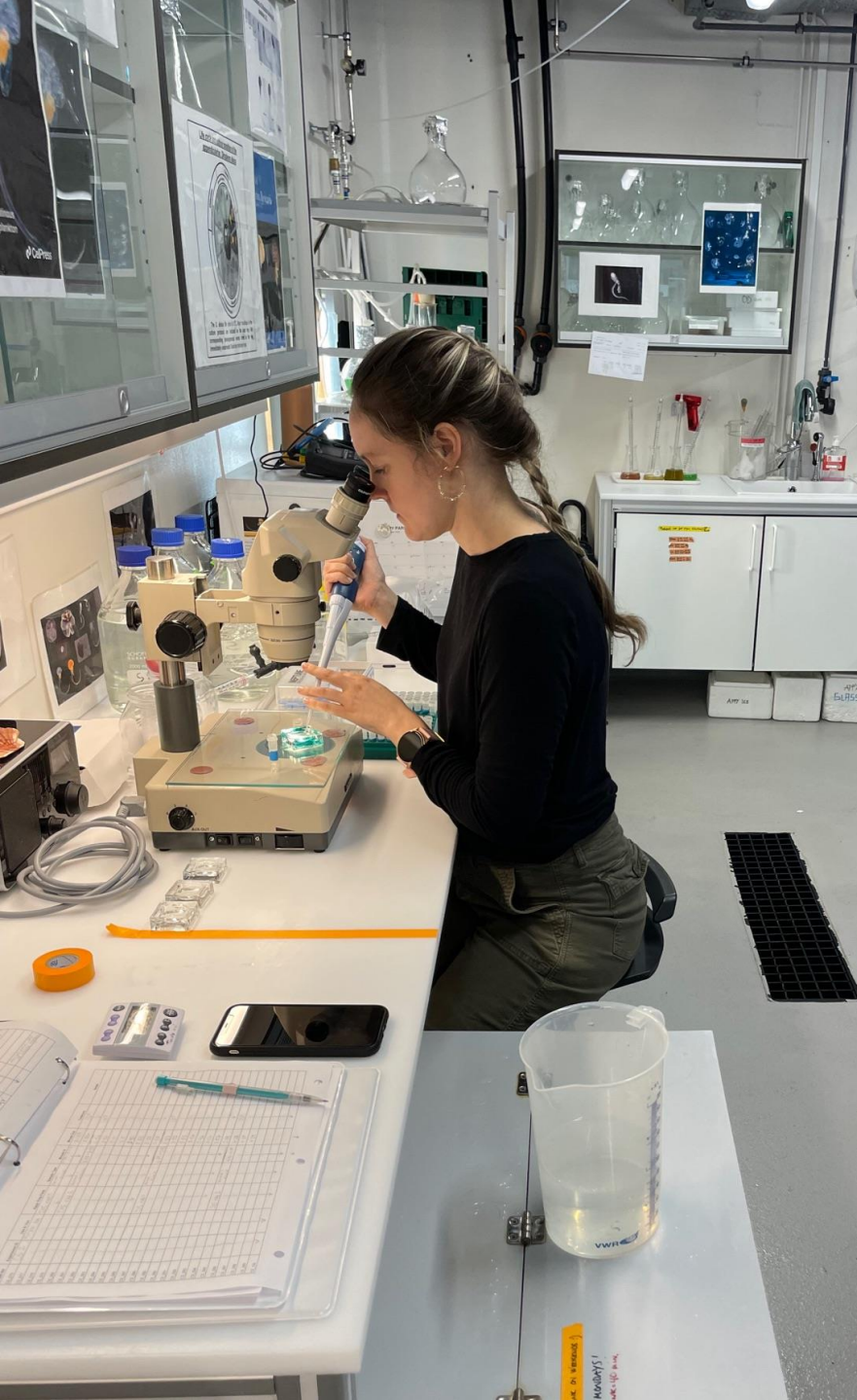


- Difference in grazing between D6 and D7 life stages
- Final life stage (D7) has a marked increase in grazing



# Future Investigation of Appendicularian Grazing





# Acknowledgements

Anne Thompson  
Anne Aasjord  
Terra Heibert  
Avery Harman



**SIM NS**  
FOUNDATION

ECIAMEE-00001481



Portland State  
UNIVERSITY