THE IGNORED HUNTERS OF THE OCEAN

Often overlooked, these microorganisms (phagotrophic flagellates) play a key role in aquatic ecosystems by being the main consumers of bacteria and phytoplankton.
But being so small in the immense waters presents its challenges for survival.
How do they find their food? How do they eat it? Why are their predation startegies so different from one another?
Their astonishing morphological and behavioral diversity leads to many questions that can be answered through direct microscopic observations or incubations experiments.
Which microscale mechanism in this predatorial world will you be sheding light on?

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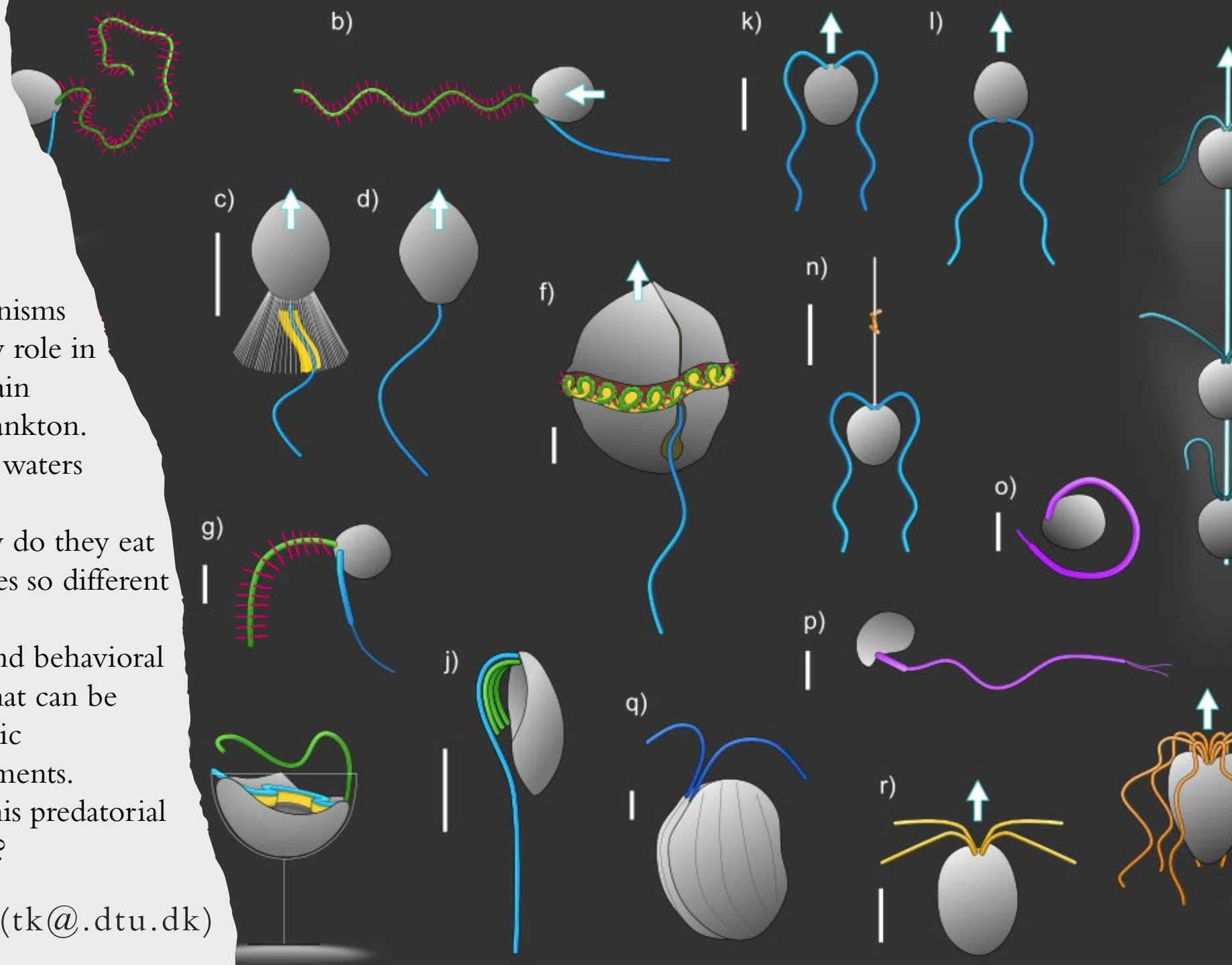
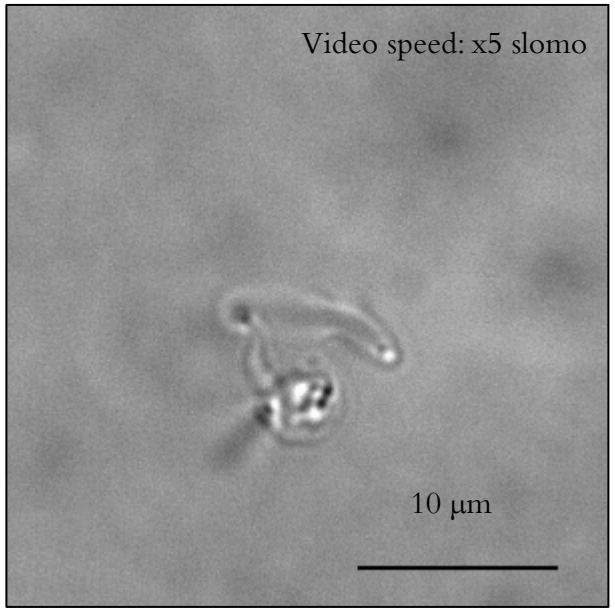


PREY SELECTION

Flagellates move their flagella (long, hair-like appendages) to create a flow to pull bacteria towards them. Some are ingested, while others are rejected after being captured? What is the nature of this selective feeding?

Through direct microscopic observations and recording with a high-speed camera, you will quantify prey selection and report the behavior of the flagellate predators when offered diferent types of food.

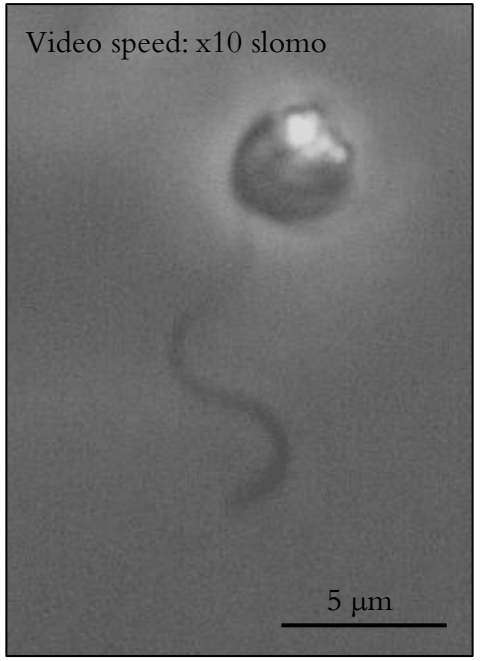


A flagellate captures a bacterium but decides to release it because it doesn't want to eat it. Why?

GROWTH RATES & INGESTION RATES

Flagellates are very successful predators. However, there are very few studies of their population dynamics, especially of newly identified species. What is the functional response of these small critters?

You will carry out incubation experiments, where the predator will be offer fluorescently labelled bacteria. Using a fluorescent microscope, you will count the number of flagellates and the number of ingested bacteria over time.

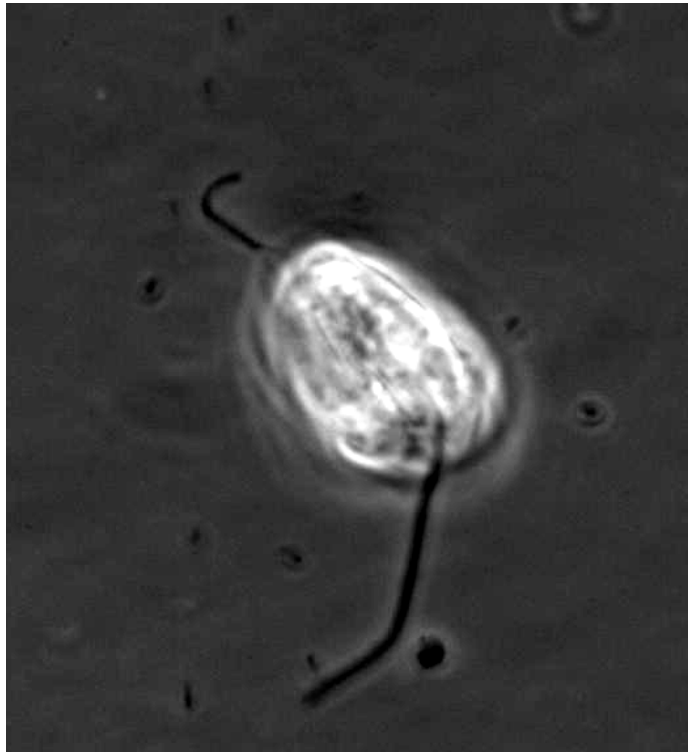


A flagellate captures a bacterium and slowly prepares to ingest it.

CHEMOSENSING FOOD

All living organisms have different strategies to find their food. As a tiny flagellate in the nutrient-diluted ocean, you must be able to effectively detect new sources of prey. But how good are they really at it?

Different species of flagellates differ in their swimming and feeding behaviors. Some even move their anterior flagellum seemingly 'smelling' for food. Here, you will report changes of behavior with high/low availability of food, and how long do they take to 'travel and colonize' a new spot rich in bacteria.



A flagellate that seems to use its anterior flagellum to 'smell' for food.