Host Response

FISH441 Lecture 15

Steven Roberts

Host Response

Let's Anthropomorphize

What might scare marine invert?

Today: *Physiological Response* to things that are bad

It is important the think about the big picture.

What else is going on with the critter...

resource allocation

Where are these resources coming from?

Today: *Physiological Response* to things that are bad

It is important the think about the big picture.

What else is going on with the critter...

really big picture -

What has the population experienced.

Defense Systems

- Anatomic Features
- **Immunity**

Anatomic Features

Anatomic Features

Key reference: Arnott, S. A., Neil, D. M. and Ansell, A. D. (1999). Escape trajectories of the brown shrimp *Crangon crangon*, and a theoretical consideration of initial escape angles from predators. *J. Exp. Biol*. **202**, 193-209.

Anatomic Features

FLOWER GARDEN BANKS
NATIONAL MARINE SANCTUARY
NATIONAL MARINE SANCTUARIES

tinyurl.com/cgbso7

What is the overarching fear in those three examples?

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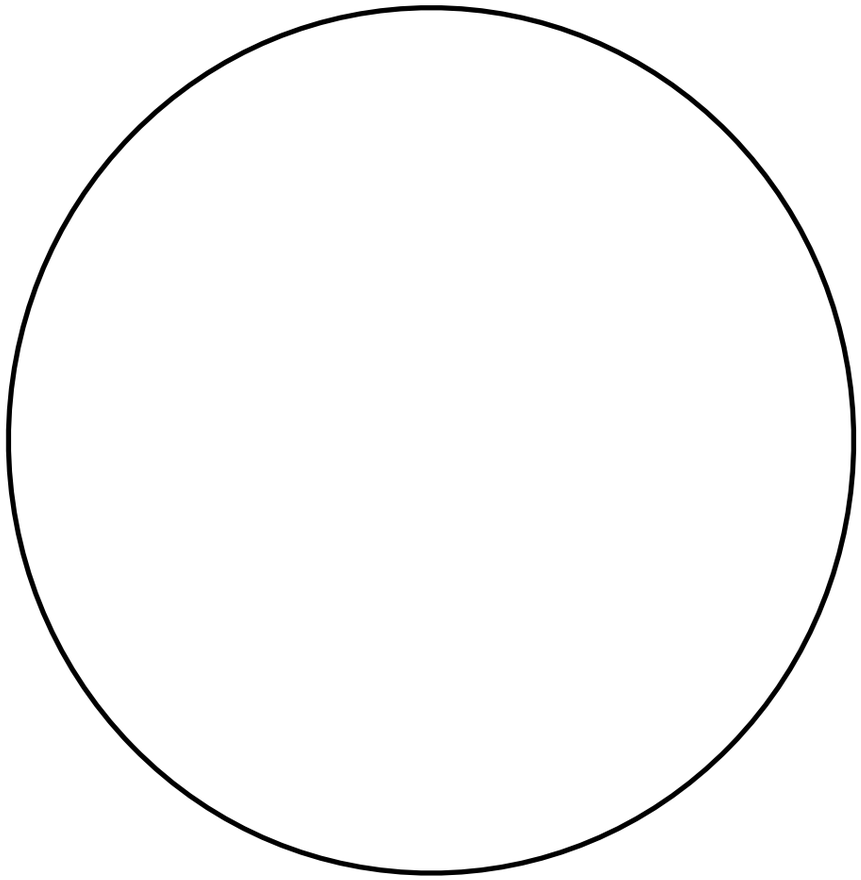
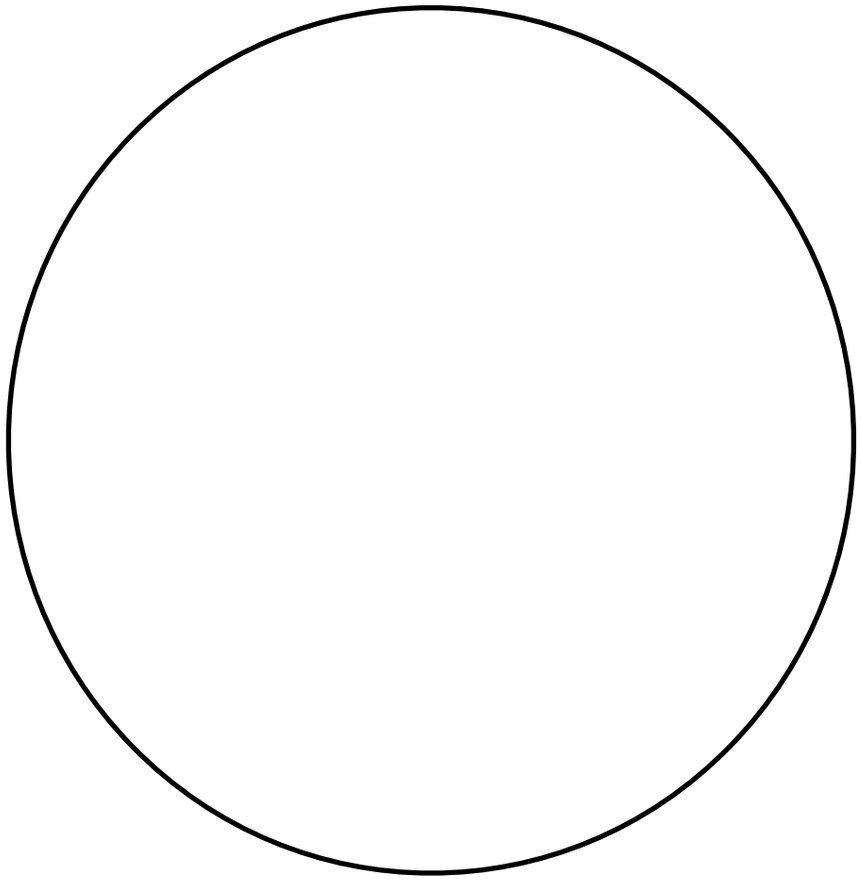


What is the overarching fear in those three examples?



Defense Systems

- Anatomic Features
- **Immunity**

Immune System

- Defense against *pathogens*
- Removal of "worn-out" cells and tissue debris (**wound healing** and tissue repair)
- ID and destruction of **abnormal cells** that originate in the body.

Immune System

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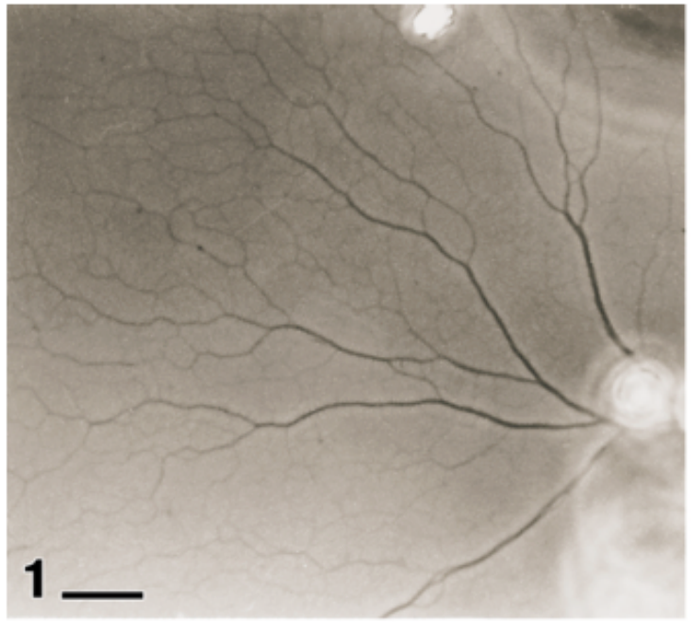
Pathogens

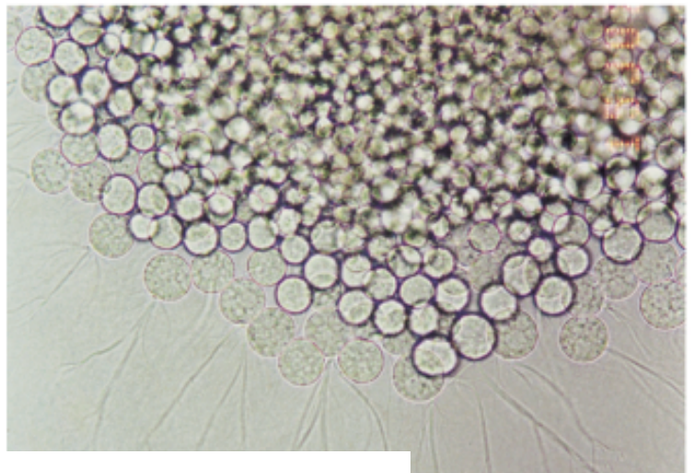
Pathogens

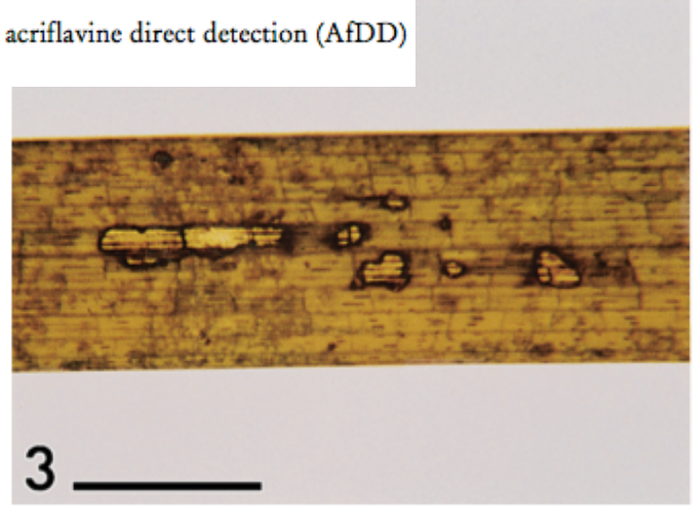
- Disease producing power known as _____
- Bacteria - release enzymes or toxins
- Internal parasites (larger; protozoa, fungi) - use resources, damage tissue
- Virus - not self sustaining; lack ability to for *energy production* and *protein synthesis*

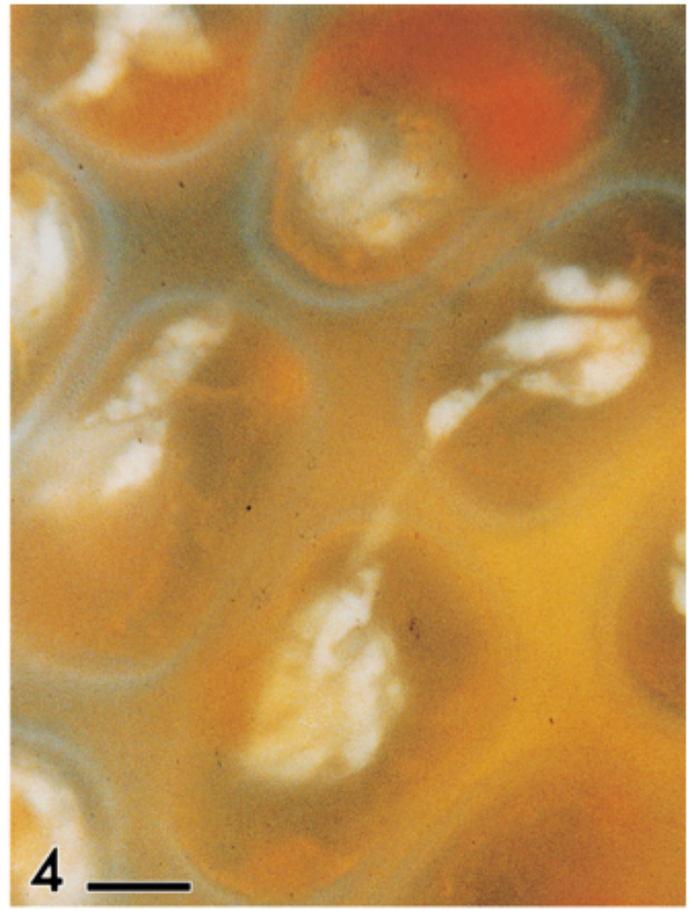
Bacteria - Vibrio

Protists
Fungi-like
Thraustochytrids









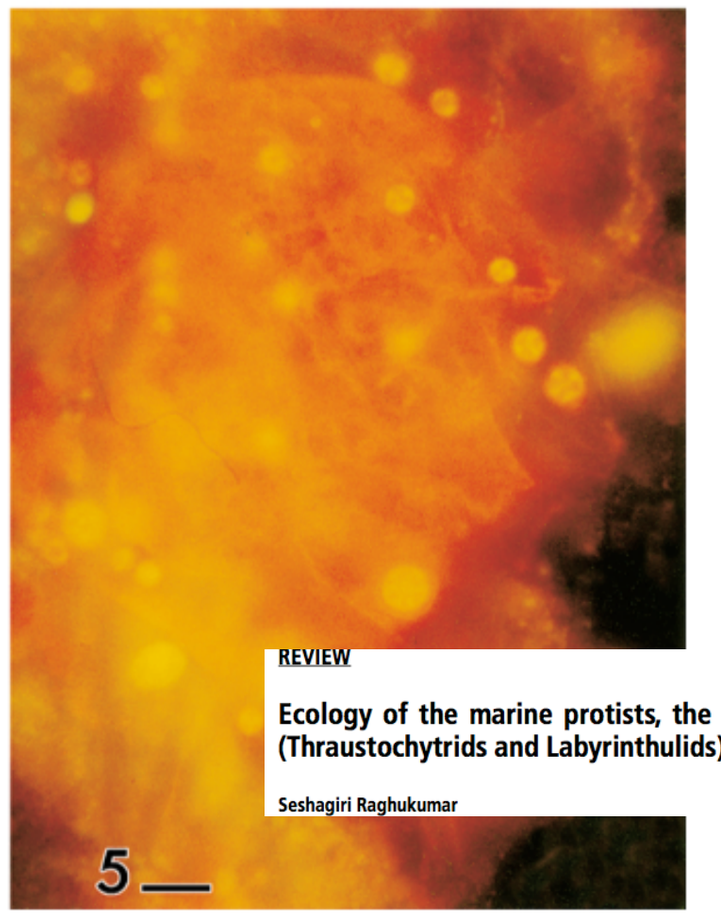


Fig. 1. Cells of a thraustochytrid growing on a nutrient agar medium. Bar represents 50 µm.

Fig. 2. Ectoplasmic net elements of a thraustochytrid cell. Scale bar = 20 µm.

Fig. 3. Leaves of the seagrass *Thalassia hemprichii* Escherson showing necrosis, presumably caused by *Labyrinthula* sp. Scale bar = 1 cm.

Fig. 4. Epifluorescence micrograph of cells of *Labyrinthula* within the tissue of the seagrass *Thalassia hemprichii* Escherson, labelled with Calcofluor. Scale bar = 20 µm.

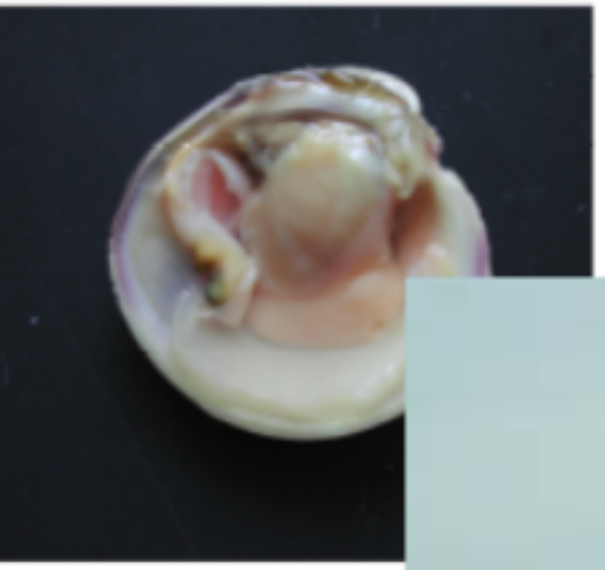
Fig. 5. Cells of thraustochytrids in phytoplankton detritus, stained using the acriflavine direct detection (AfDD) technique. Scale bar = 10 µm.

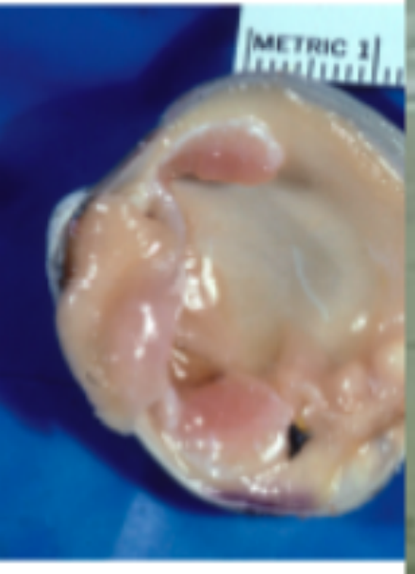
REVIEW

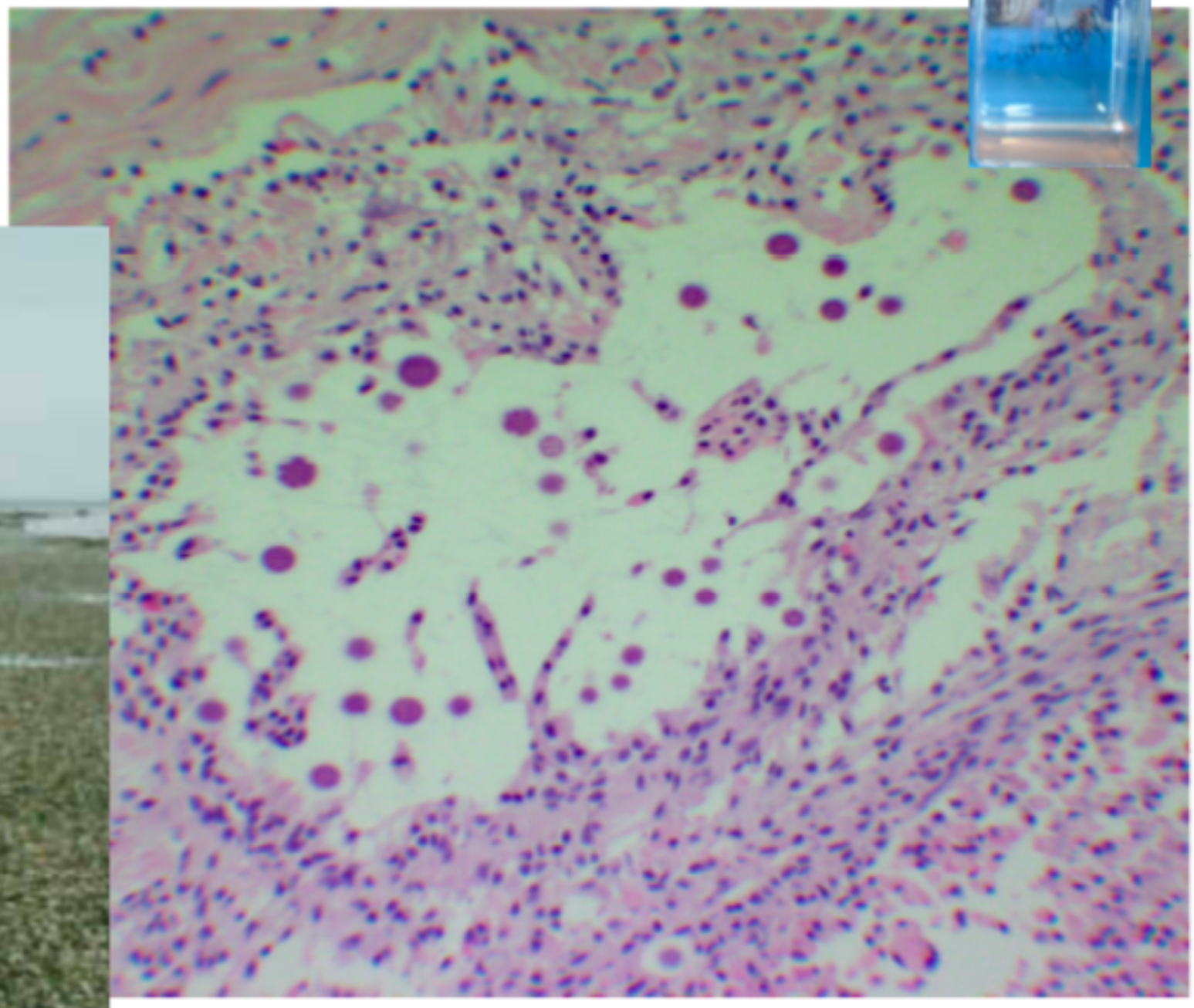
Ecology of the marine protists, the Labyrinthulomycetes (Thraustochytrids and Labyrinthulids)

Seshagiri Raghukumar

Fungi - QPX



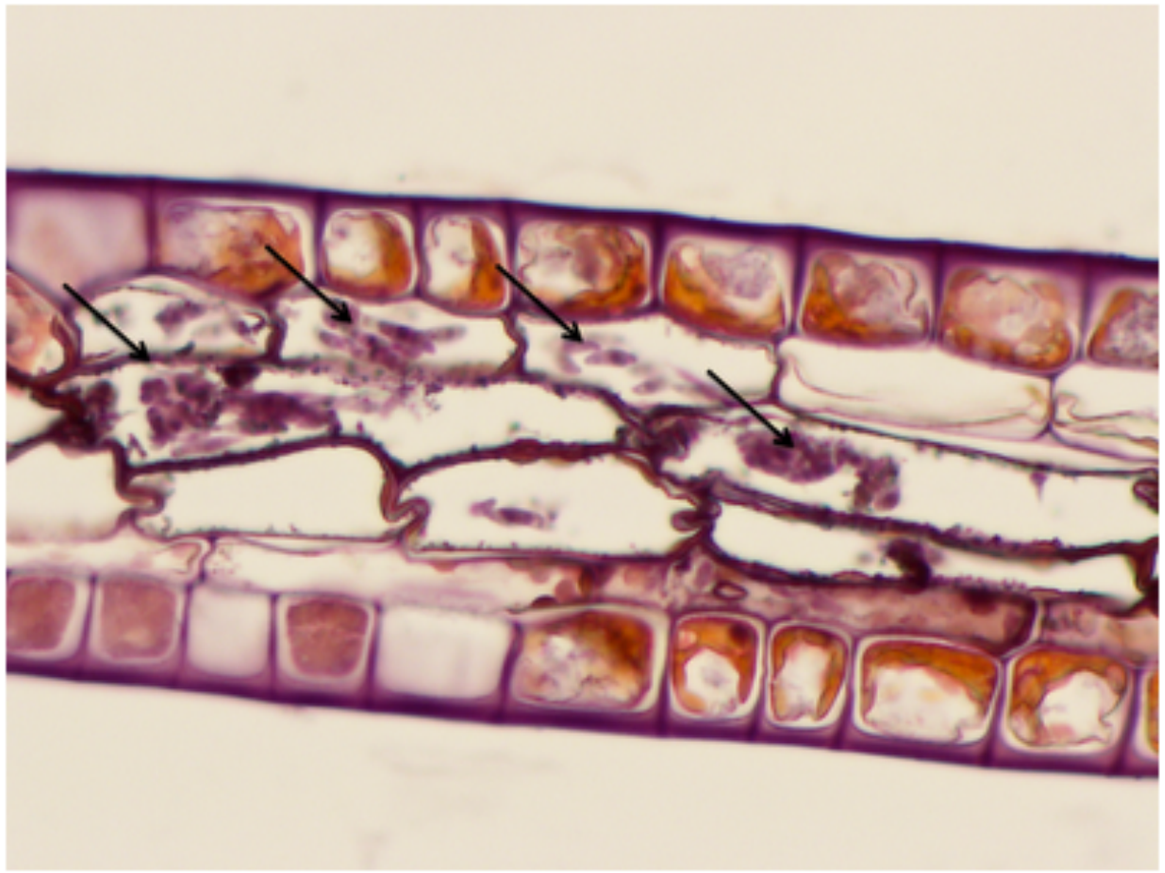




Roxanna Smolowitz

Colleen Burge - Oct 14, 2011 - Limited

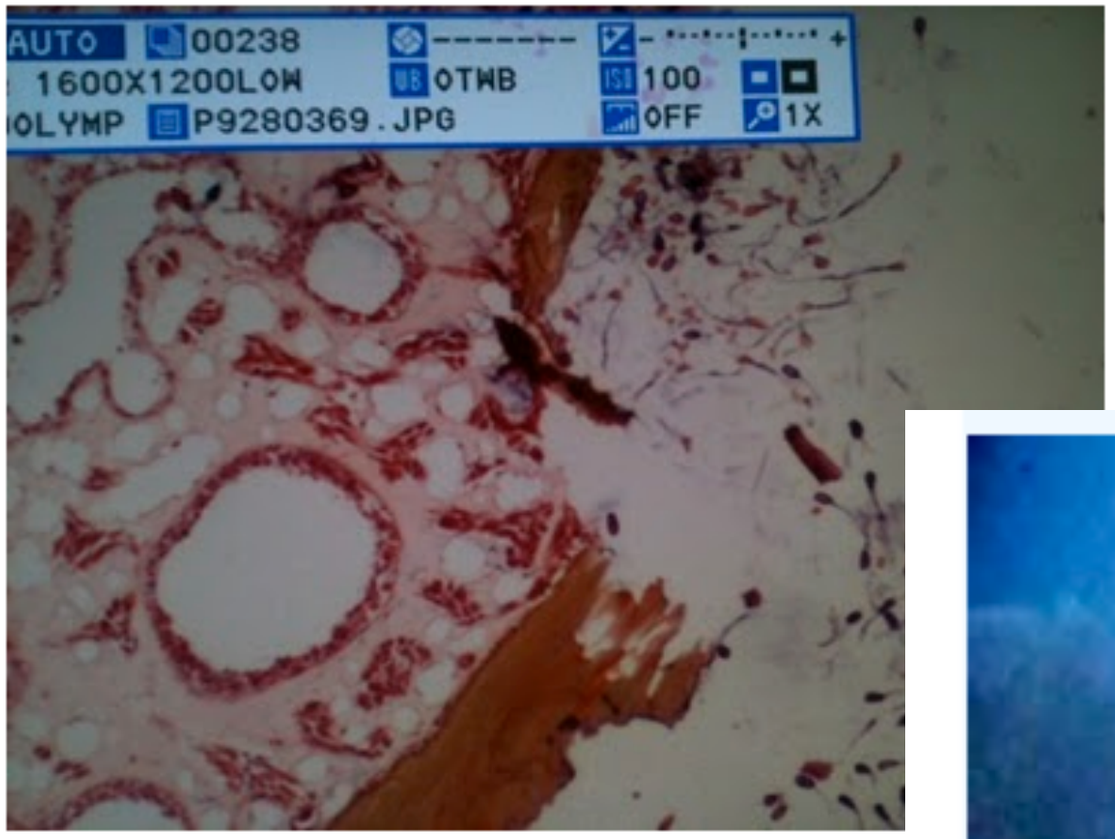
arrows point to sea grass Labyrinthula, I think (40X), don't ask me about th



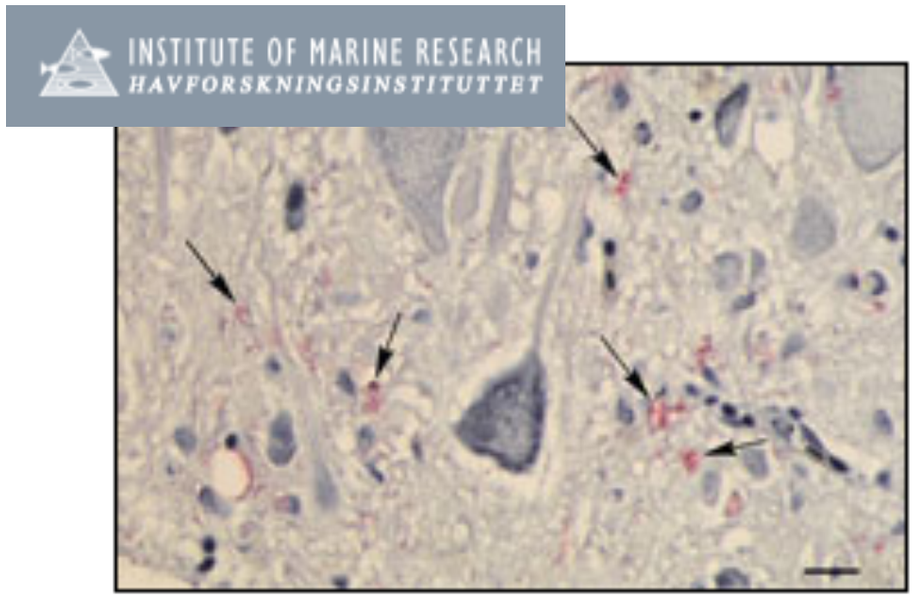
More photos from Colleen Burge

Colleen Burge - Sep 28, 2011 - Mobile - Limited

Really sad sea fan, really happy Laby



Virus - Nodavirus



Brain of salmon contaminated by nodavirus.

Development of diagnostic and management techniques to select cod broodstocks and hatchery stocks free from nodavirus

Northeastern Regional AQUACULTURE Center

Phage

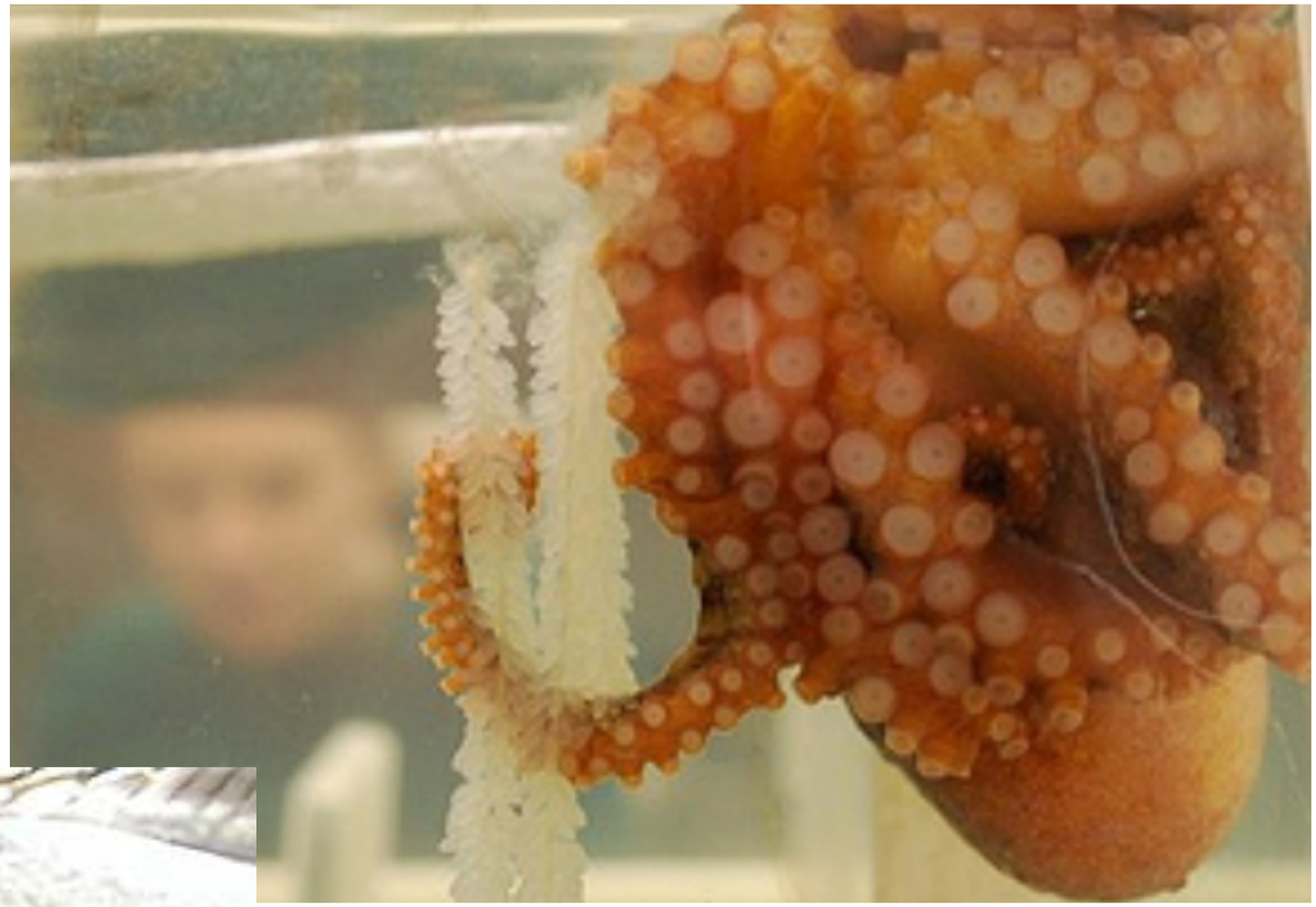
Abalone

Caused by a bacteria..

Immune Response

- **Innate Immunity - non-specific**
- Acquired Immunity- adaptive; selectively targets

Chemico-physical Barrier

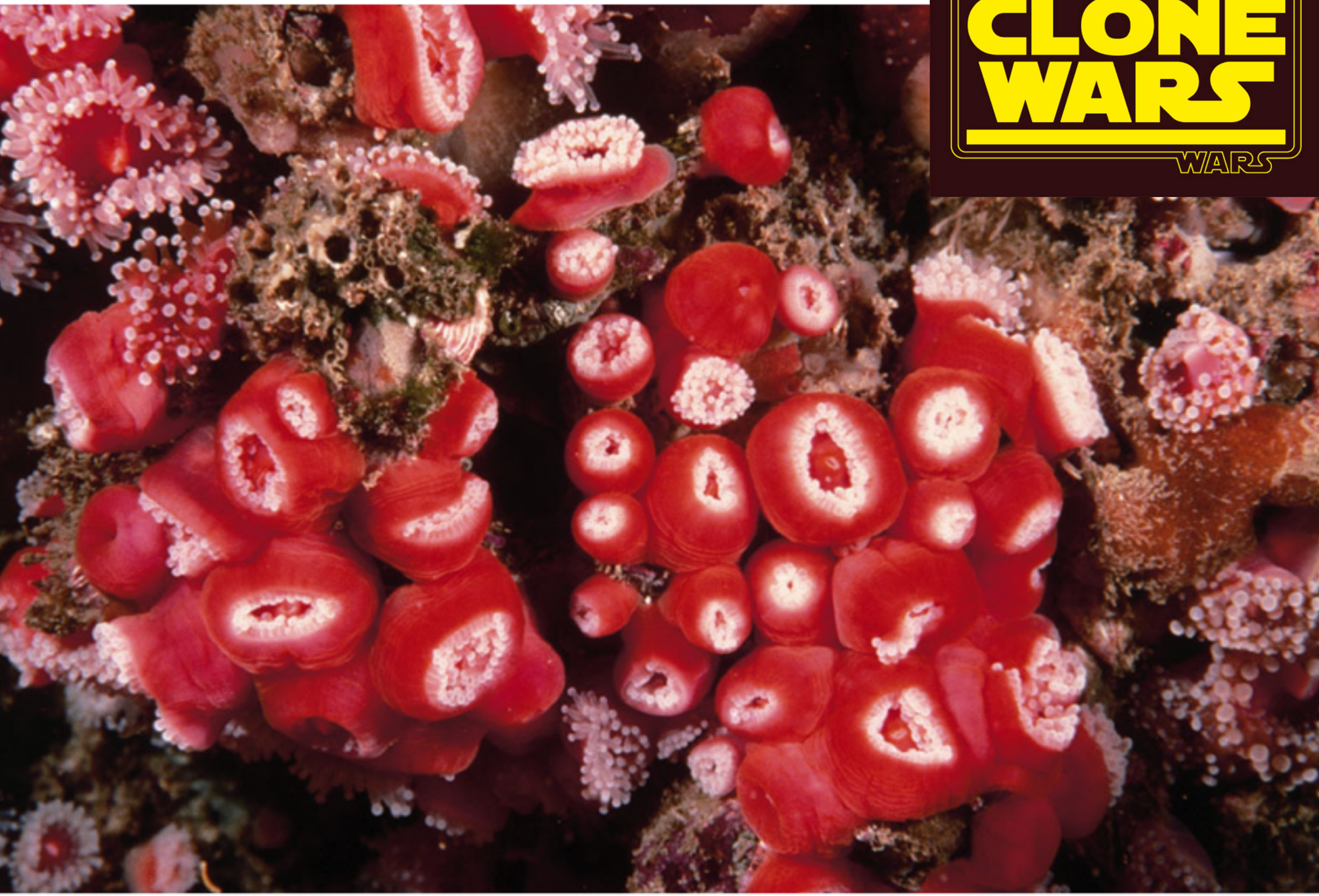


anti-microbial peptides

beneficial microbial communities

from the beginning...

How do organisms distinguish self from non-self?

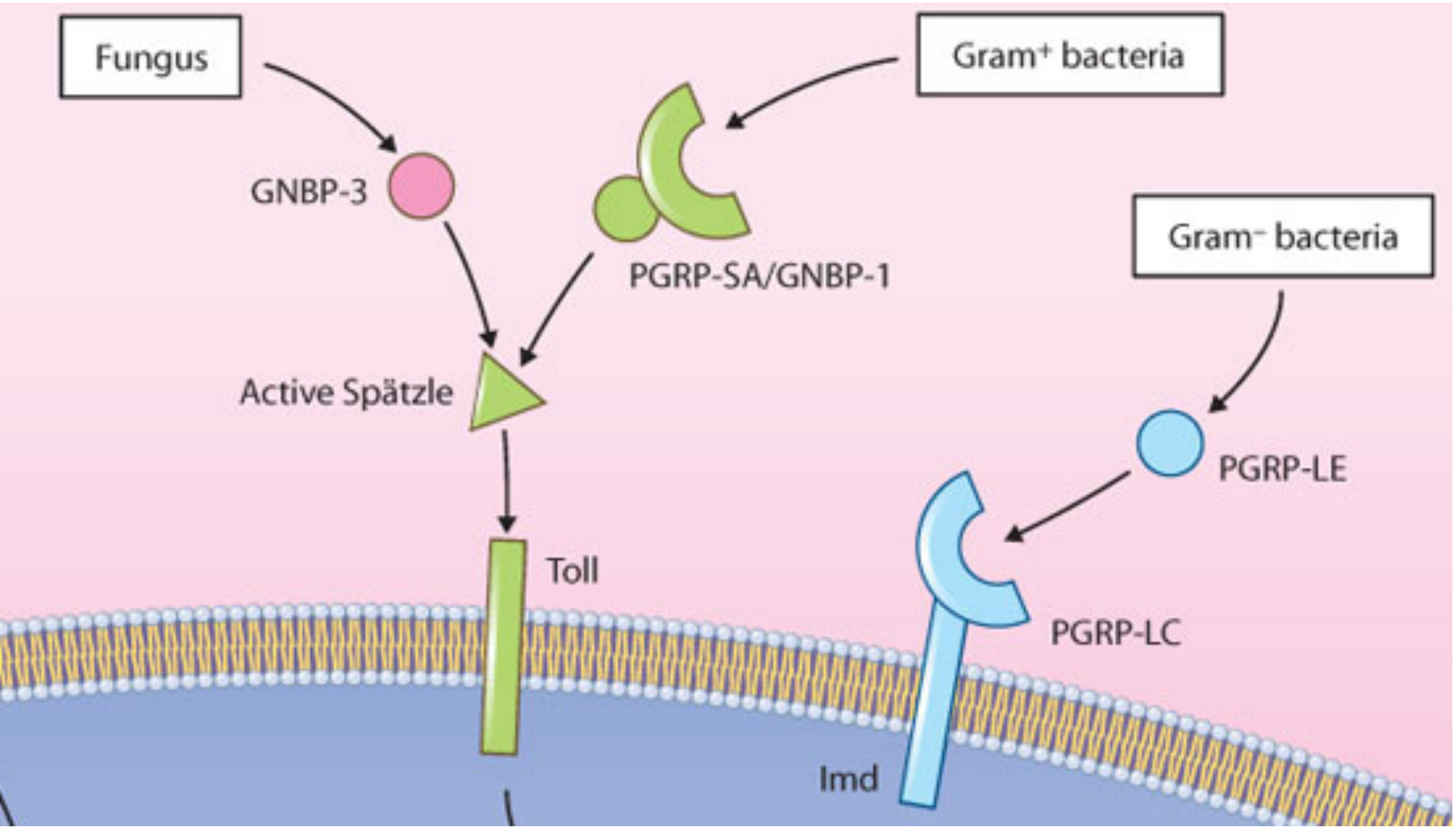


This is a picture of two *A elegantissima* or *A. sola* fighting with acrorhagia. Taken at San Simeon, CA by Dave Cowles

How do organisms distinguish self from non-self?

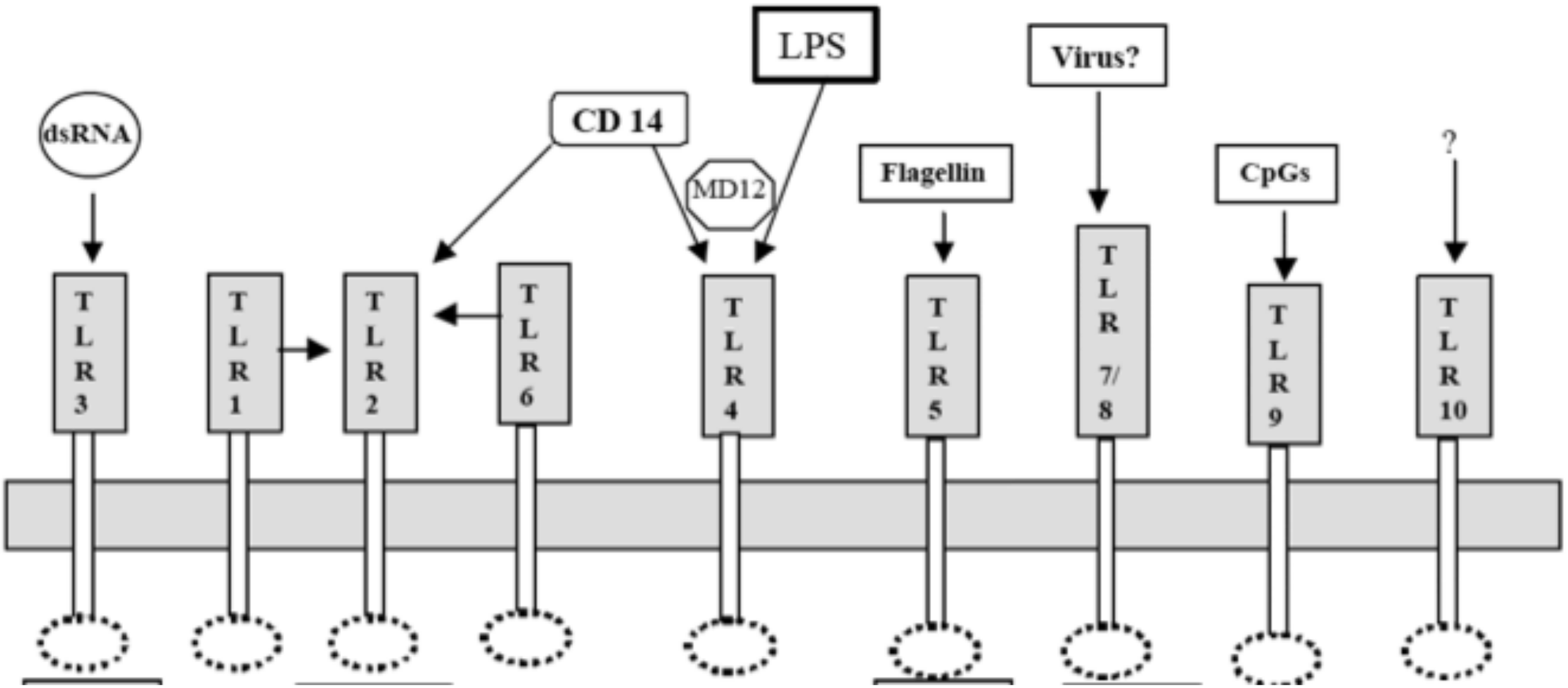
pattern recognitions proteins (PRPs)

PRPs



Toll-like Receptors
Peptidoglycan recognition proteins

PRPs - Toll-like Receptors



That's how the immune system knows bad things are there...