
Protista

e.g. Amoeba

Learning Objectives

- Explain the nuclear structure of Amoeba
 - Explain the sub cellular structure of Amoeba
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Amoeba

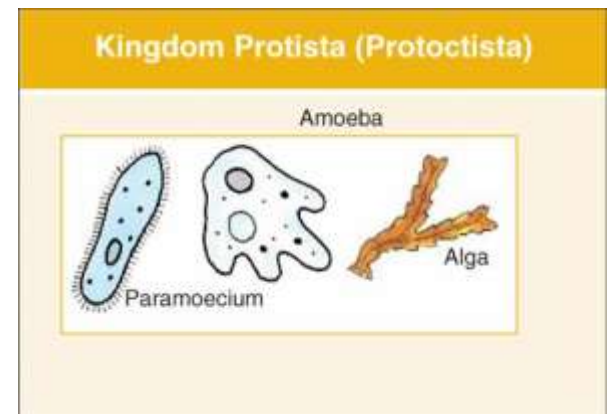


Recall Protista characteristics

- Contains single-celled and simple multi-cellular organisms
 - They are eukaryotic – they have a membrane-enclosed nucleus and membrane enclosed organelles
 - Some feed by taking in organic substances, others can photosynthesise.
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Examples include:

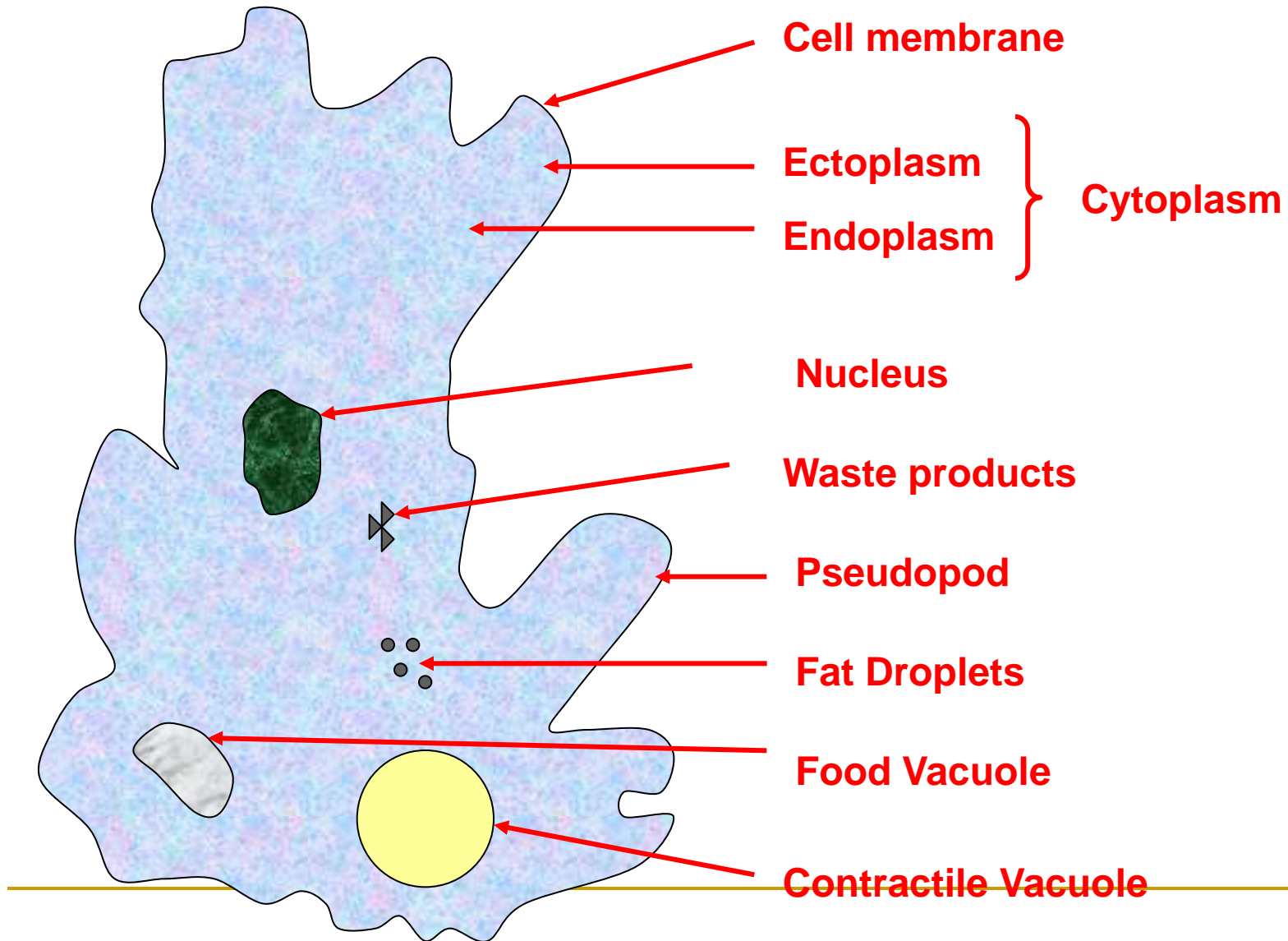
- **Amoeba** – moves by means of pseudopods and is well known as a representative unicellular organism.
- **Algae** – a large and diverse group of plant like organisms ranging from unicellular to multicellular forms
- **Paramecium** – consist of a single cell yet are visible to the naked eye



Amoeba

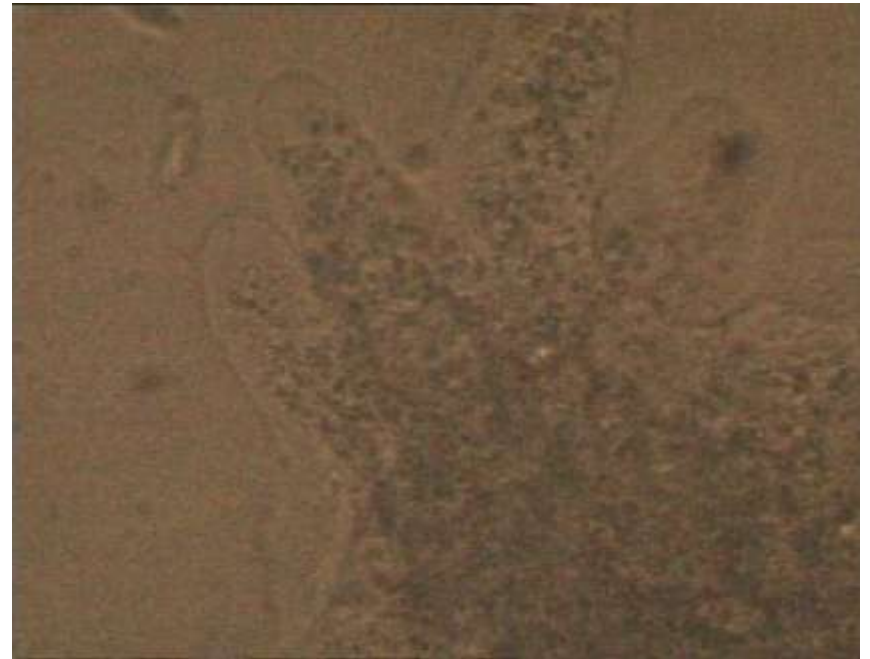
- Consists of a single cell
 - It is a consumer. It feeds on small plants, animals and bacteria
 - It lives in freshwater ponds (most likely to be found on the mud at the bottom)
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Structure of Amoeba



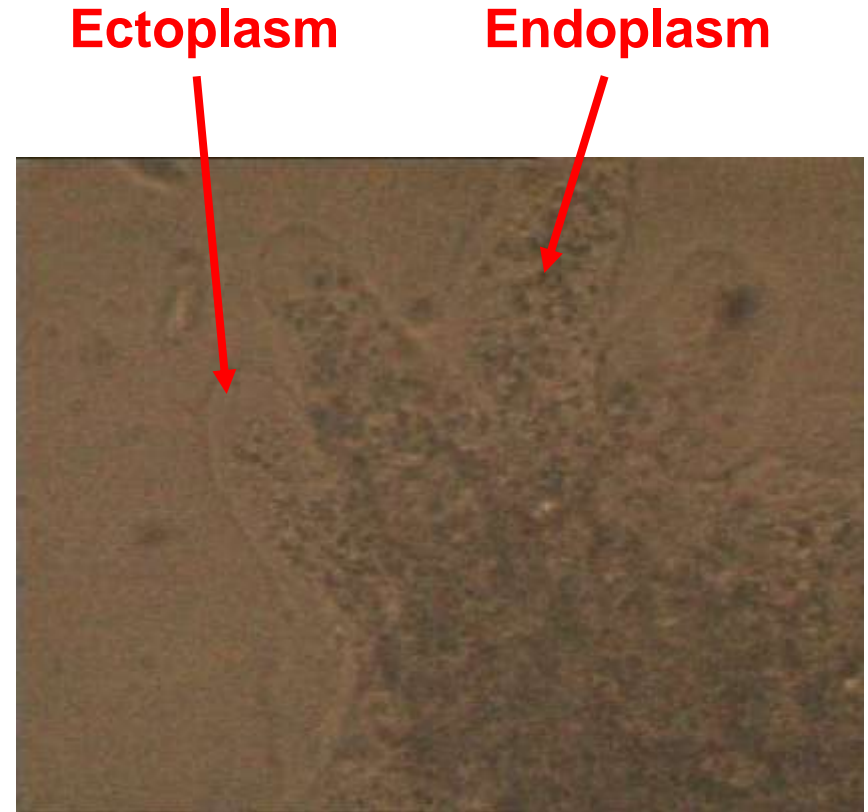
Structure of Amoeba

- Cell membrane – semi-permeable
- Cytoplasm divided up into
 - Endoplasm
 - Ectoplasm



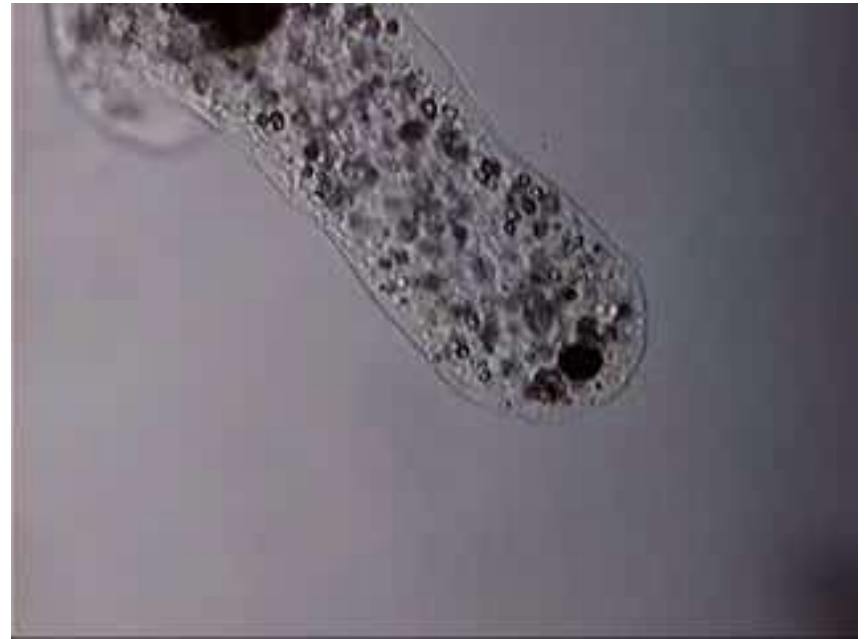
Endoplasm and ectoplasm

- The endoplasm is fluid-like. It has a grainy appearance due to the presence of food vacuoles and waste materials
- Ectoplasm can become soft in places to allow the development of pseudopodia



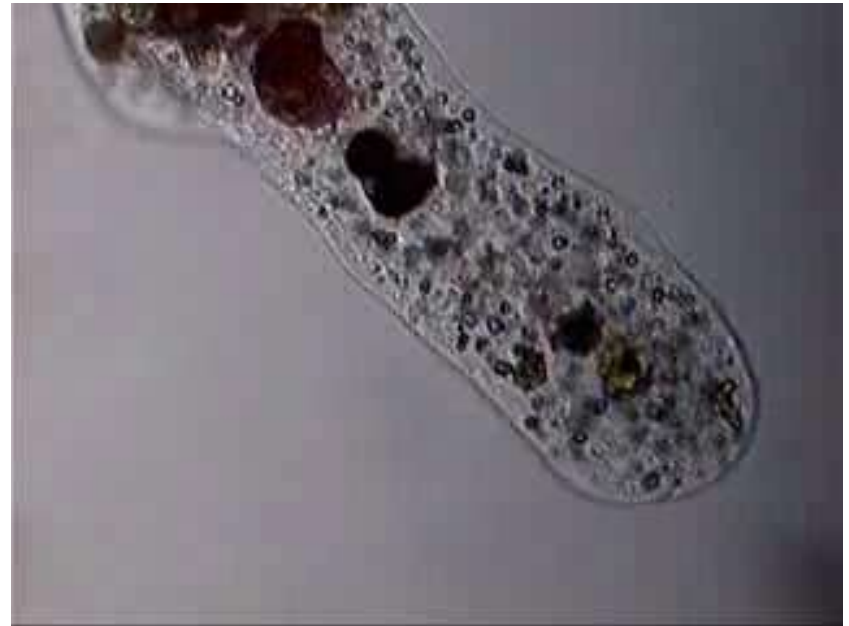
Development of Pseudopod

- Pseudopods are referred to as 'false feet' as they are produced at any point on the body and have no fixed position
- Pseudopodia extend in the direction Amoeba wishes to move

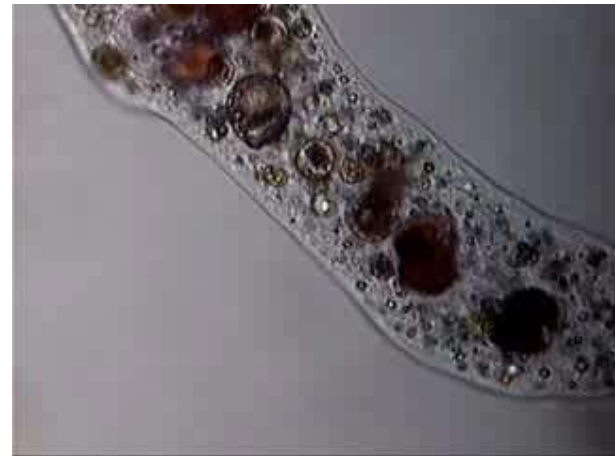
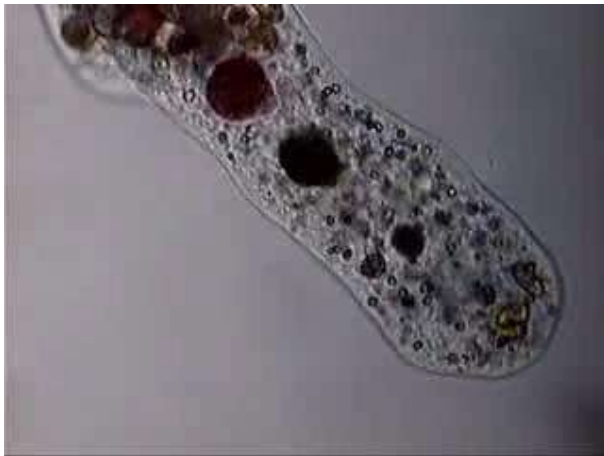
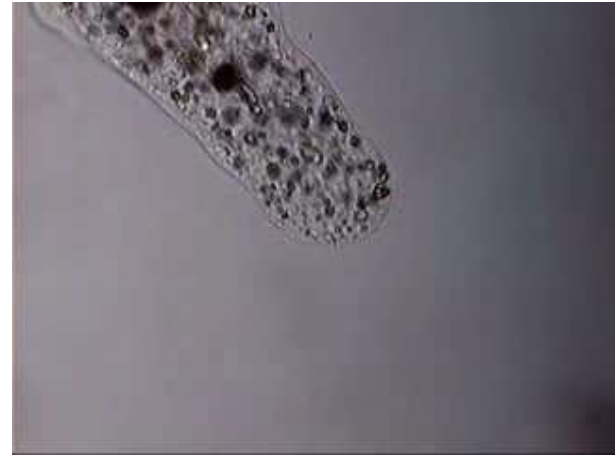
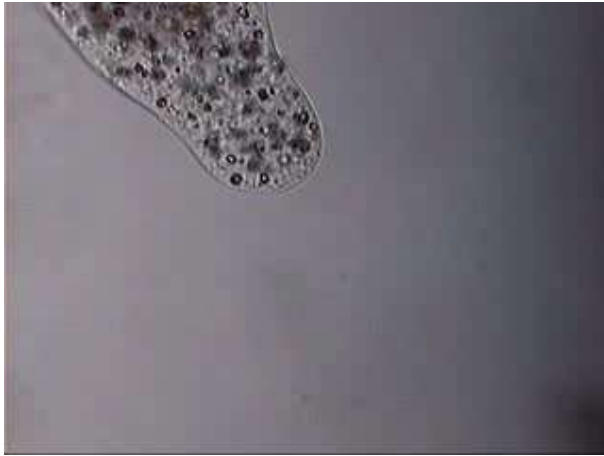


Development of Pseudopod

- Pseudopods develop when the ectoplasm softens and moves forward and the endoplasm moves in to replace it
- Amoeba uses pseudopodia to engulf its prey



Endoplasm and ectoplasm



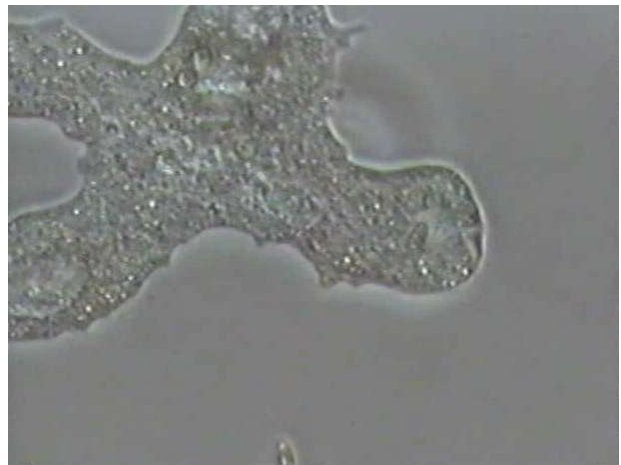
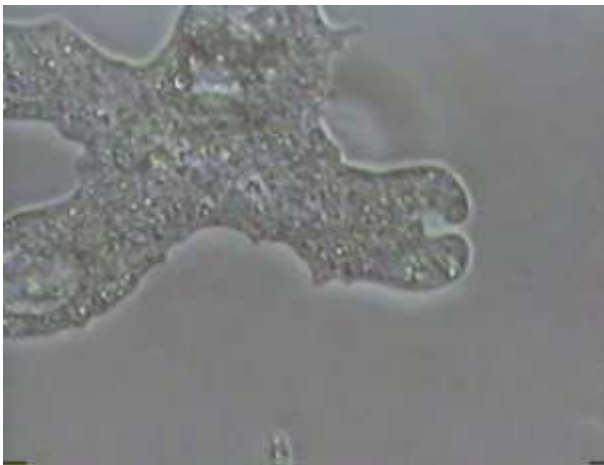
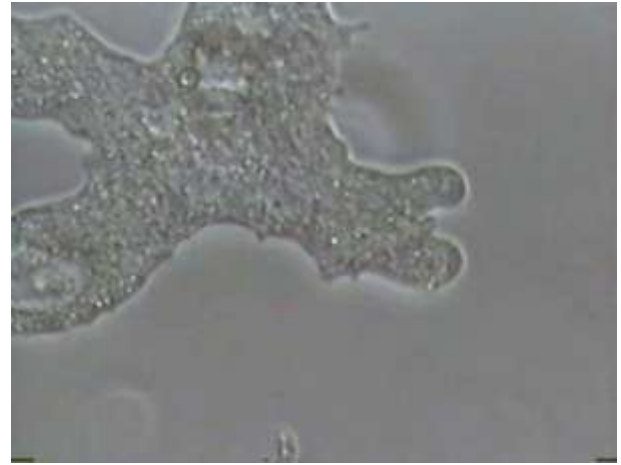
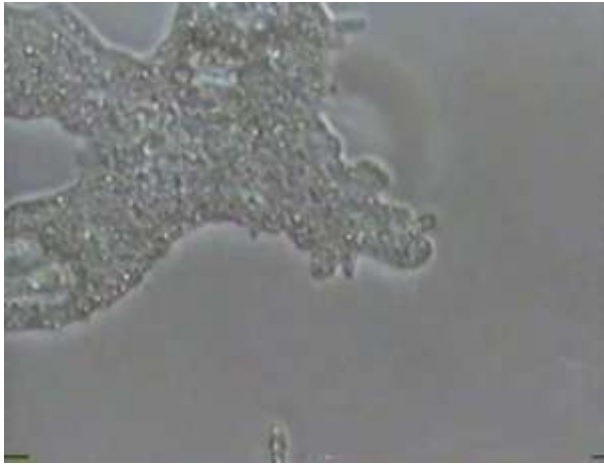
Food vacuoles

- Amoeba feeds by surrounding its prey with pseudopodia and secreting digestive enzymes into the vacuole created
- Food can then be stored within the vacuole.

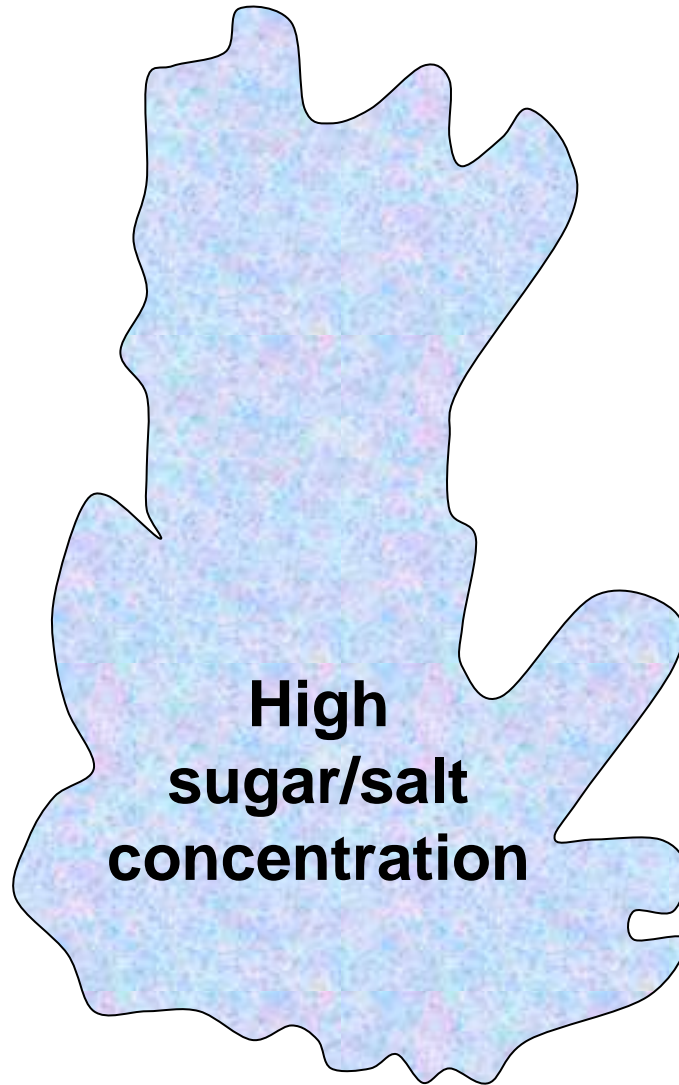


Food vacuole

Food vacuoles



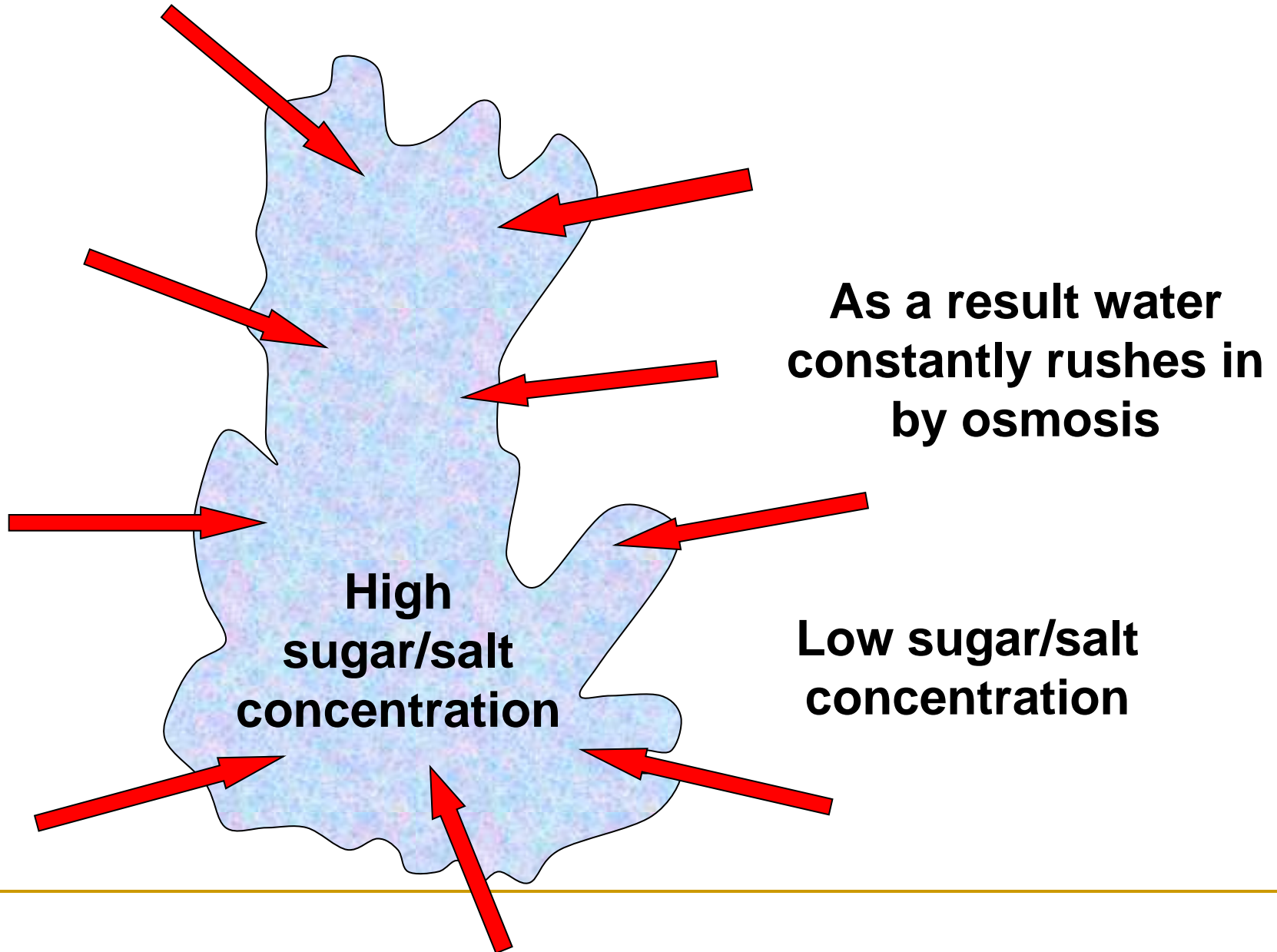
The Contractile Vacuole



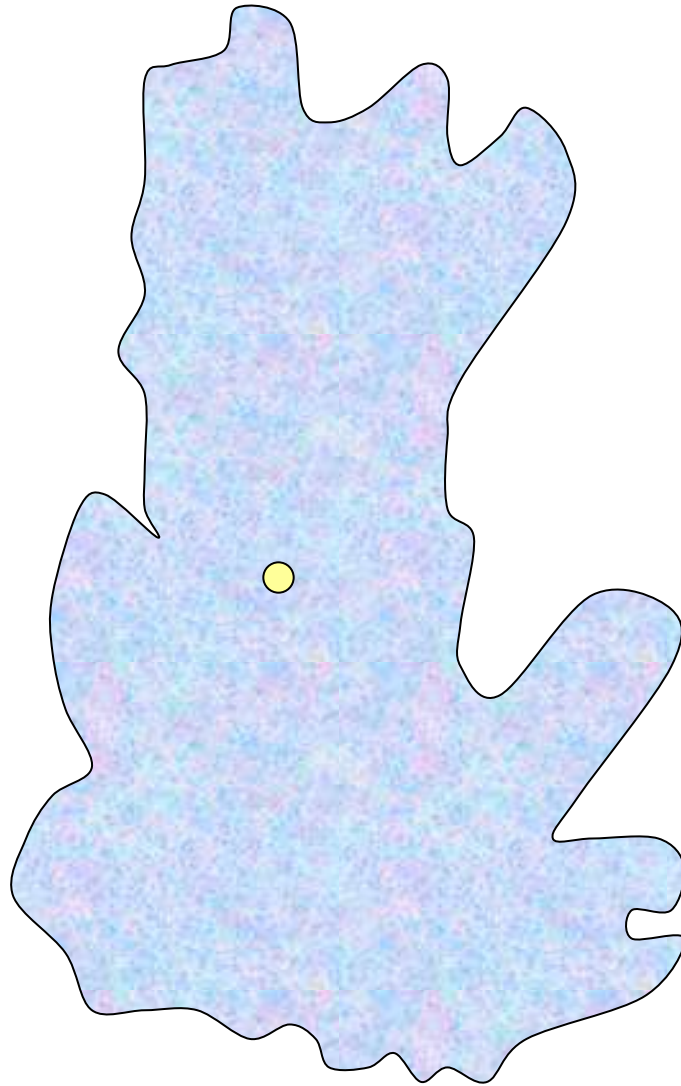
**Amoeba's
cytoplasm is more
concentrated than
the surrounding
fresh water**

**Low sugar/salt
concentration**

The Contractile Vacuole



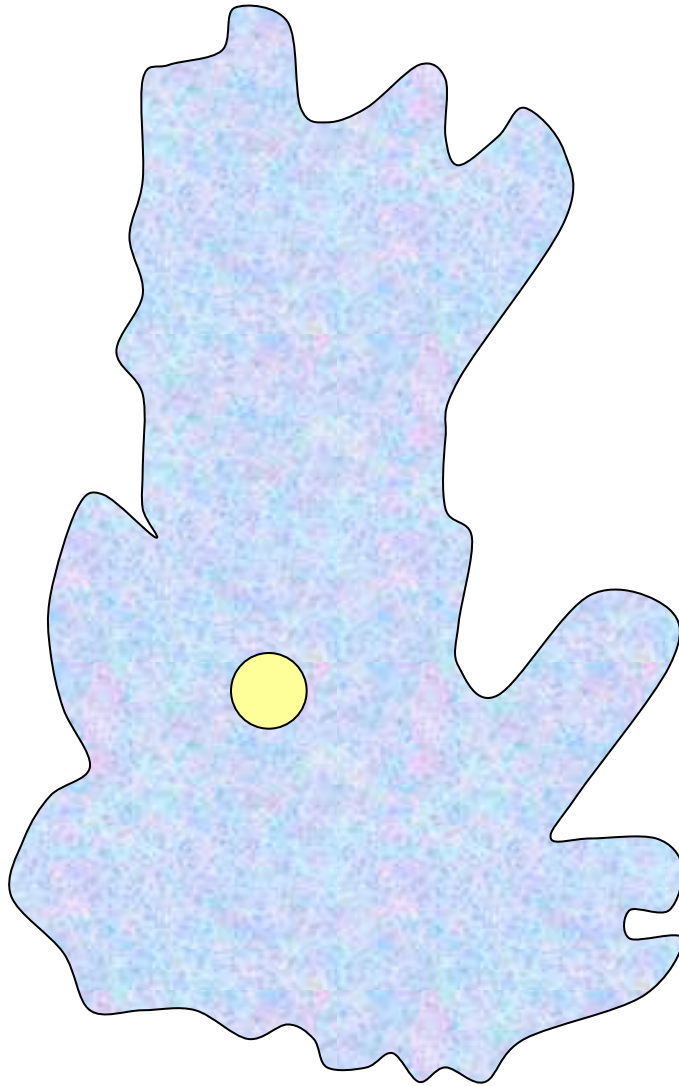
The Contractile Vacuole



**In order to deal with
this uptake of water
Amoeba forms a
contractile vacuole**

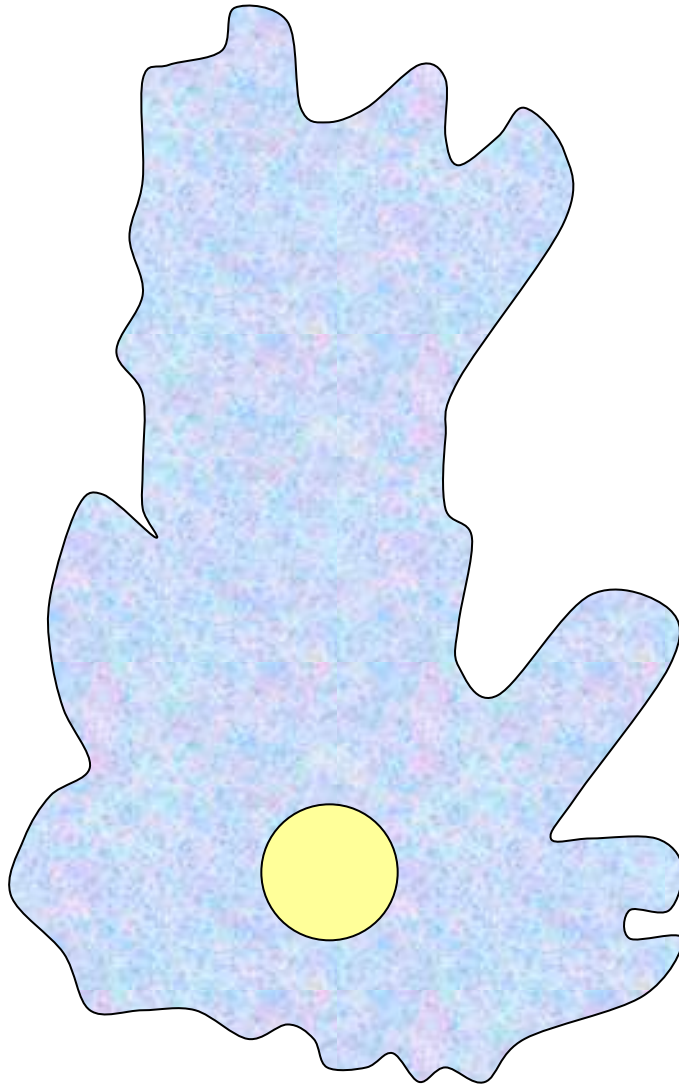
**Excess water
enters the
contractile vacuole**

The Contractile Vacuole



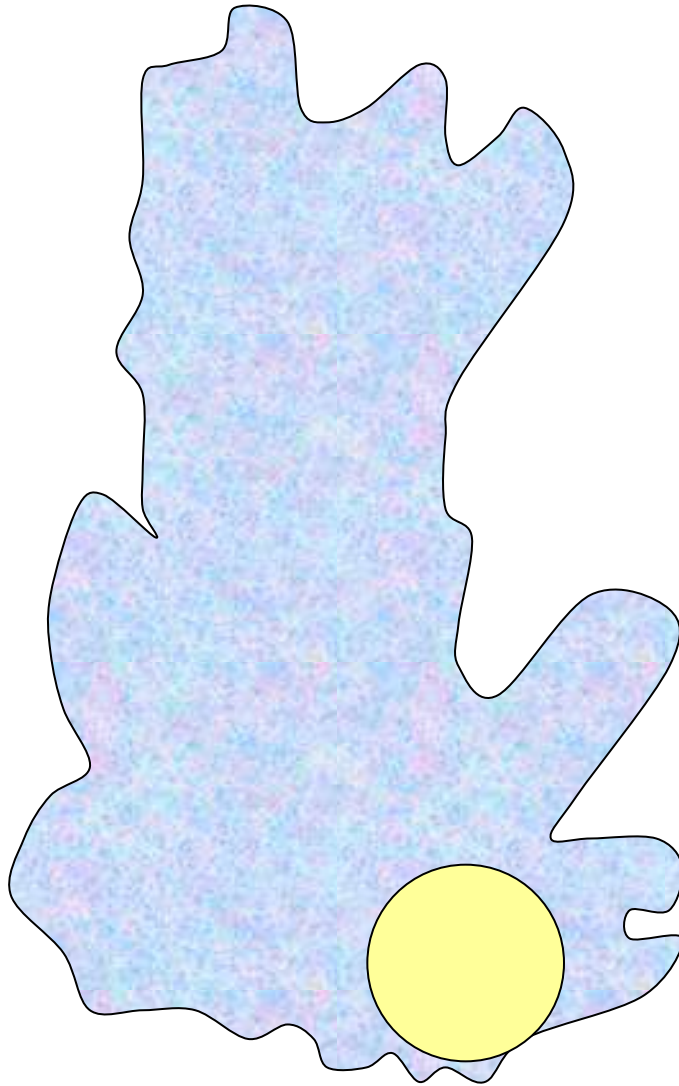
The contractile vacuole swells with water and moves to the edge of the cell...

The Contractile Vacuole



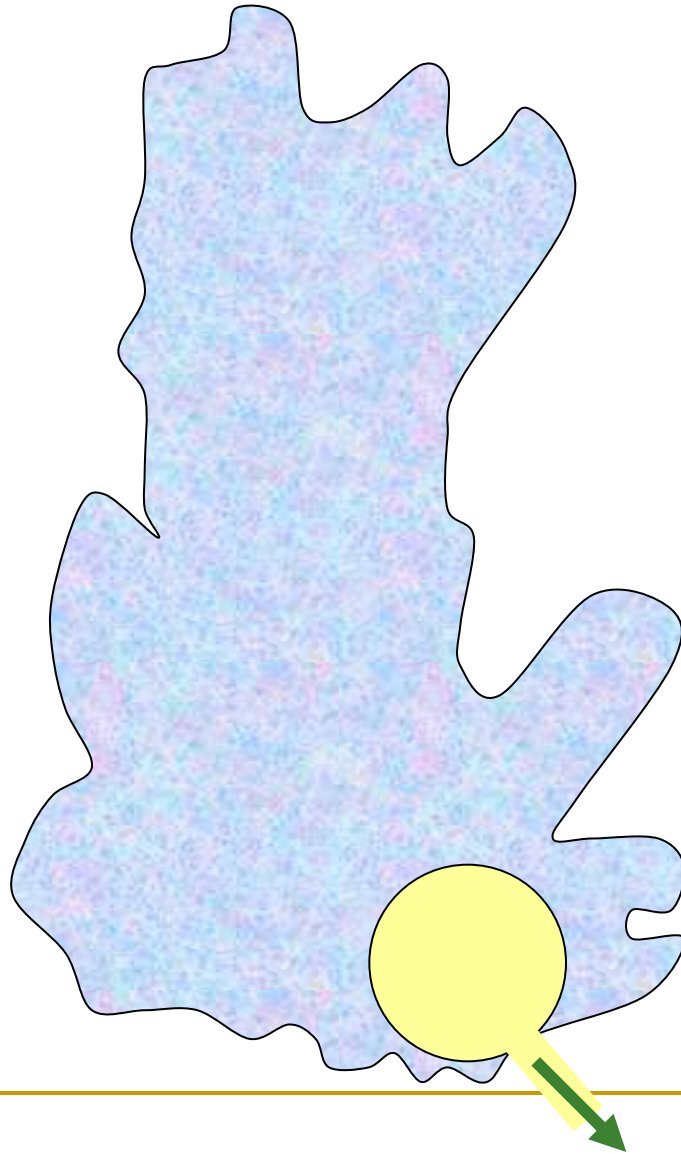
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The Contractile Vacuole



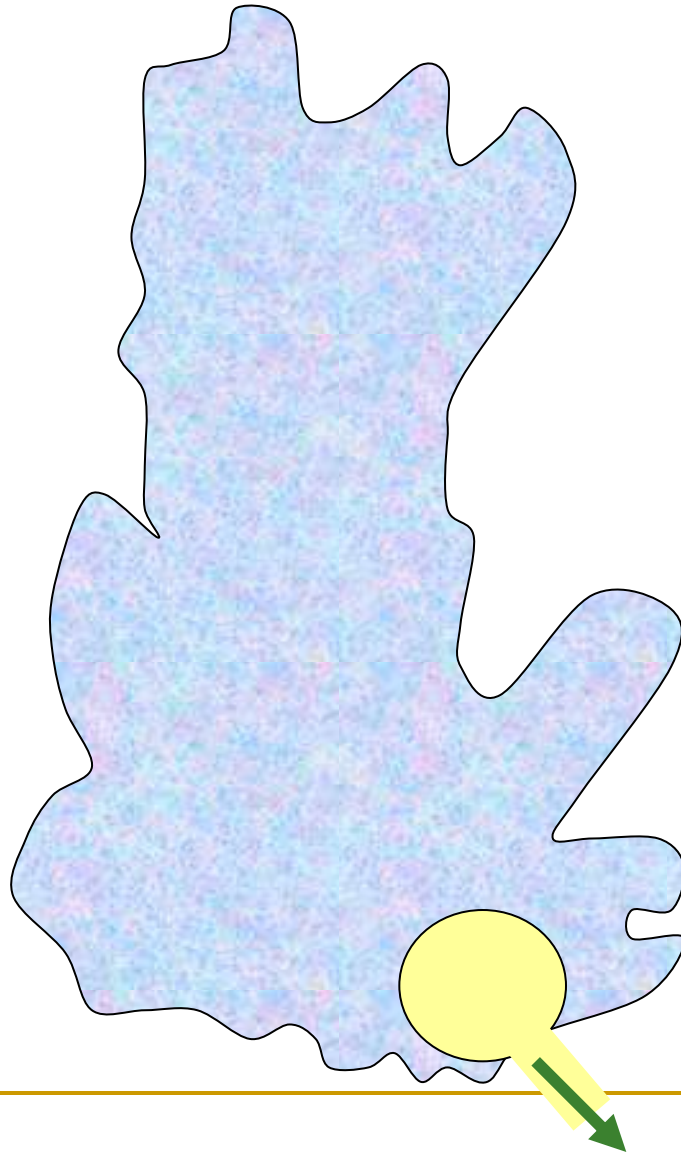
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The Contractile Vacuole



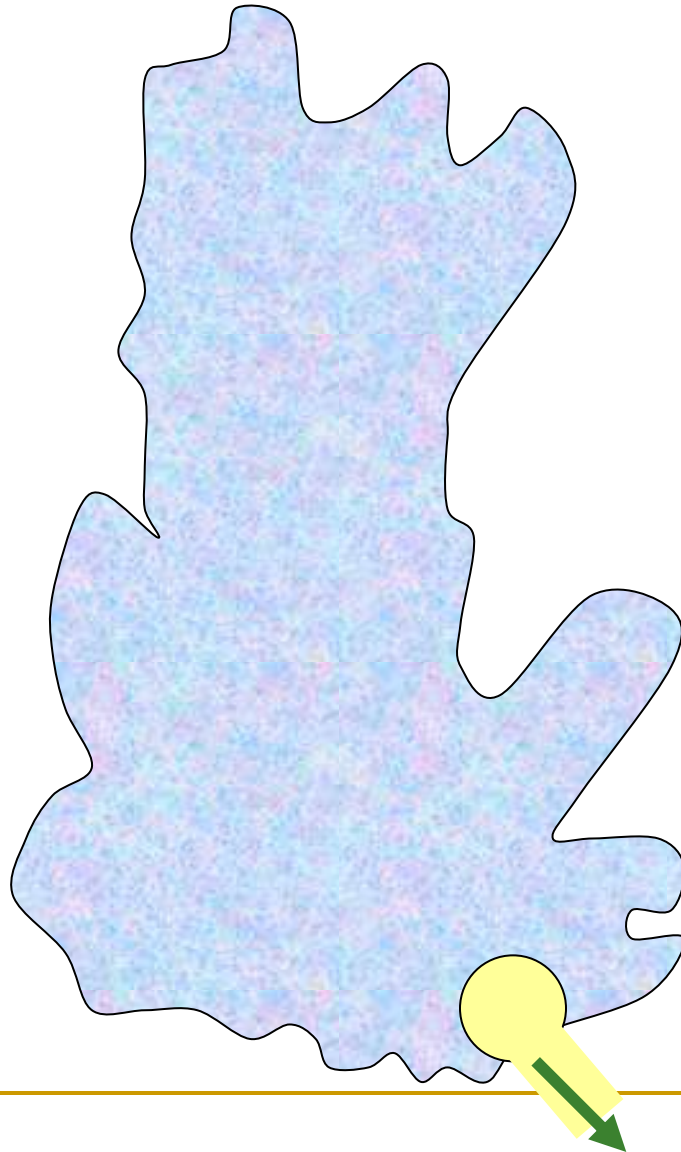
**Where it bursts
and expels the
water...**

The Contractile Vacuole



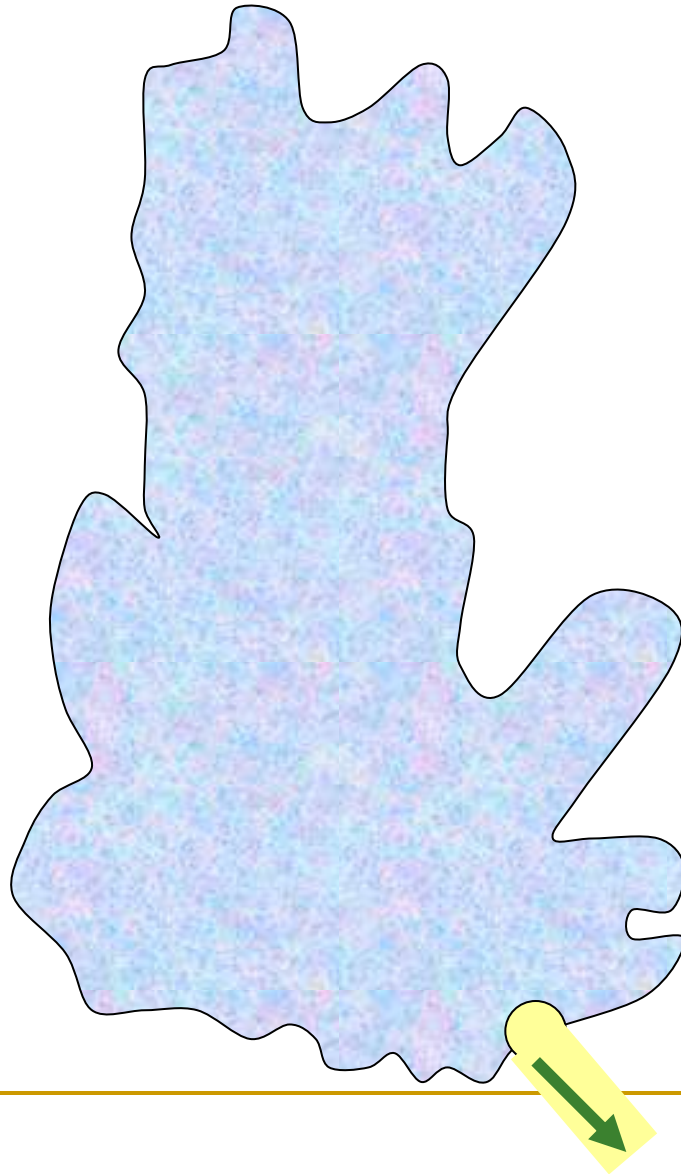
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The Contractile Vacuole



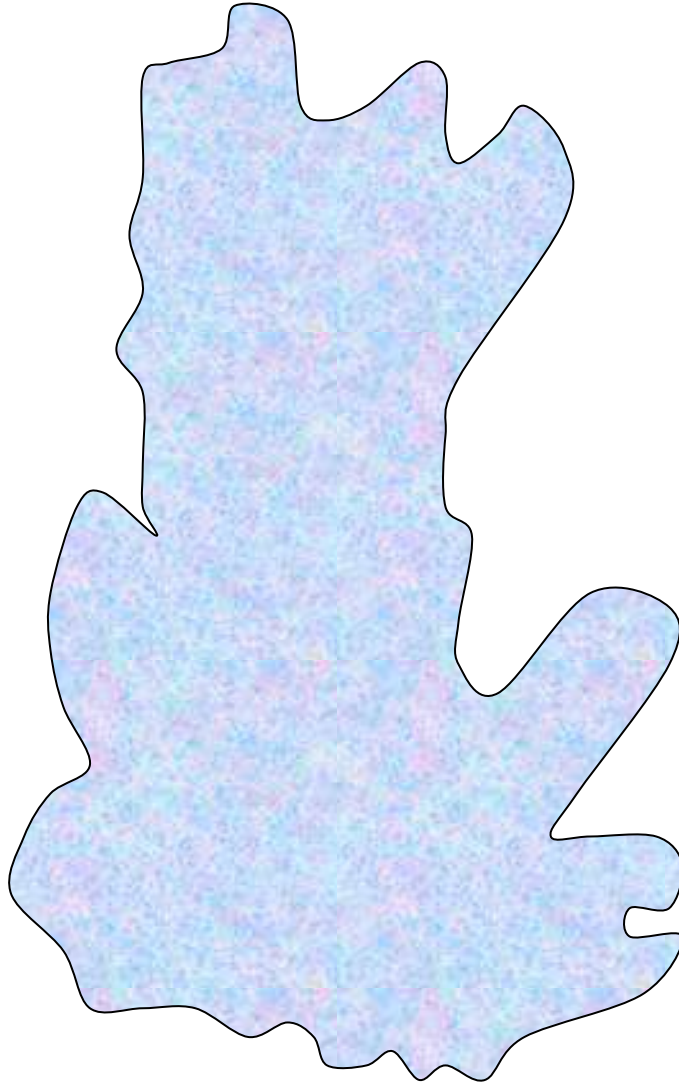
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The Contractile Vacuole



**Where it bursts
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The Contractile Vacuole

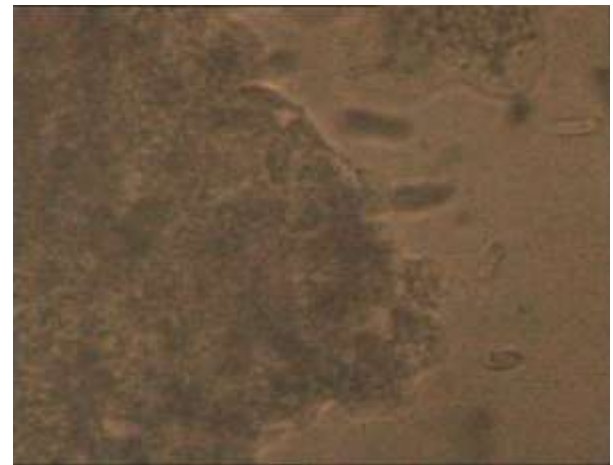
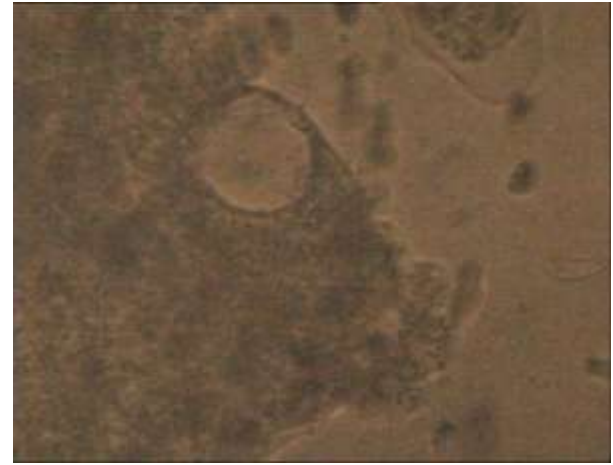
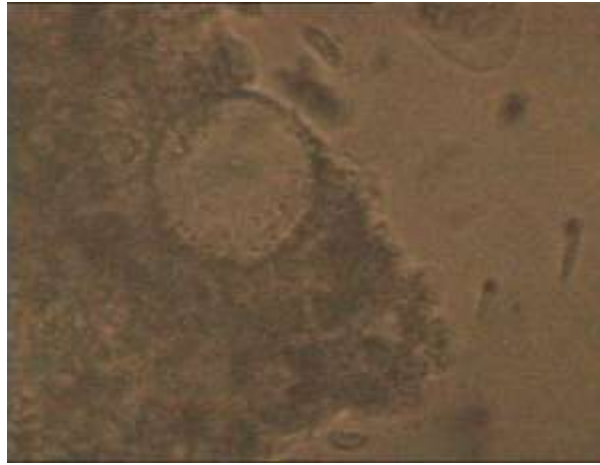


The cycle is then repeated

Contractile vacuole

- The contractile vacuole is said to be responsible for osmoregulation
 - Without it the Amoeba would expand and burst
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Contractile vacuole bursting



Learning Check

- Name the structures present within the Amoeba cell
 - Outline the role of the contractile vacuole in osmoregulation
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Syllabus

Depth of treatment

- Amoeba – cell organisation to include nucleus and sub-cellular structures