

Cell Theory

Review

Characteristics of living things.

Review

Living things -

1. Are made up of units called **cells**.
2. **Reproduce**.
3. Are based on a universal **genetic code (DNA)**.
4. **Grow and develop**.
5. Obtain and use **materials and energy**.
6. **Respond** to their **environment**.
7. Maintain a **stable internal environment**.
8. When taken as a group, **change over time**.³

Review

Living things -

Cells

Reproduce

Genetic code

Grow

Materials and energy

Respond to Environment

Stable internal environment

Change over time.

Review

- Microscopes

Light Microscopes

Light that passes through specimen.

Electron Microscopes

Use beams of electrons to produce images.

Tool for biologists

- Pronunciation of vocabulary
- www.howjsay.com

- Most cells are too small to be seen with unaided eye.
- Before 17th century, no one knew cells existed.

Anton van Leeuwenhoek

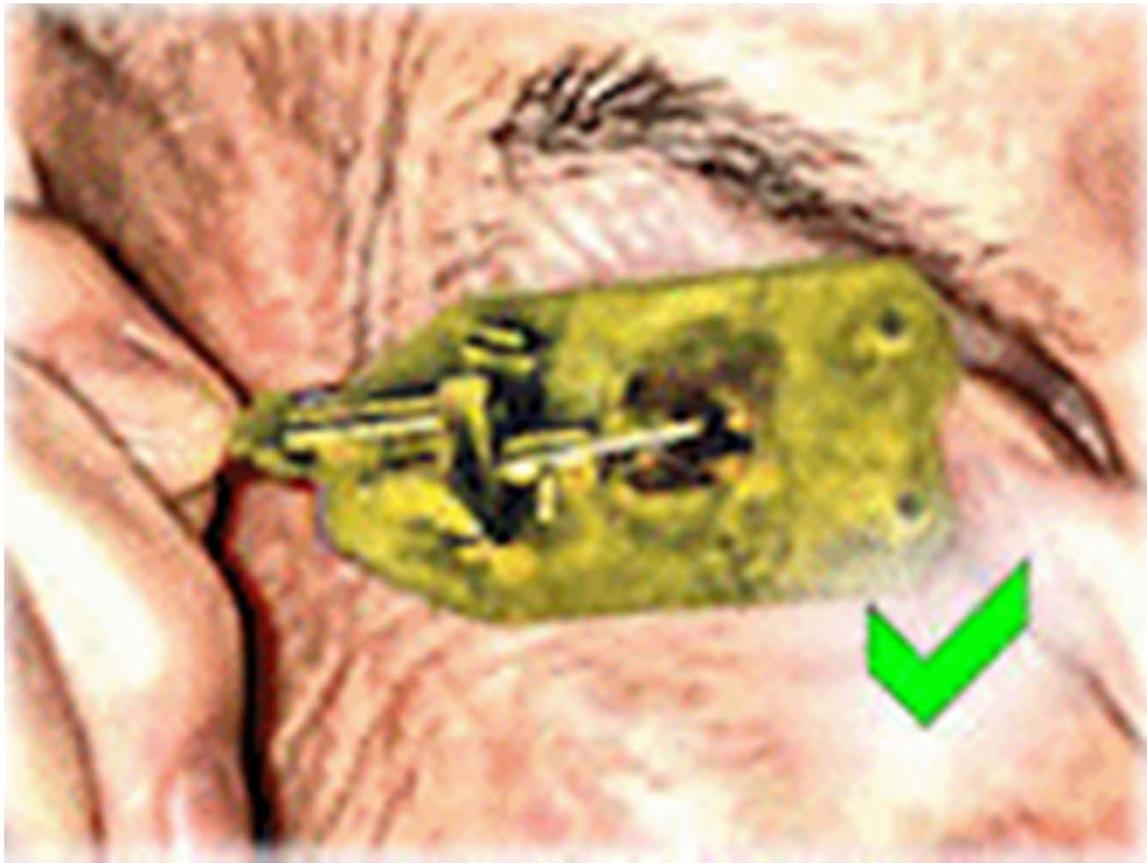


- 1632 - 1723
- Dutch scientist (Holland)
- Made 1st handheld microscope
- Observed microscopic organisms in pond water

Anton van Leeuwenhoek



Anton van Leeuwenhoek

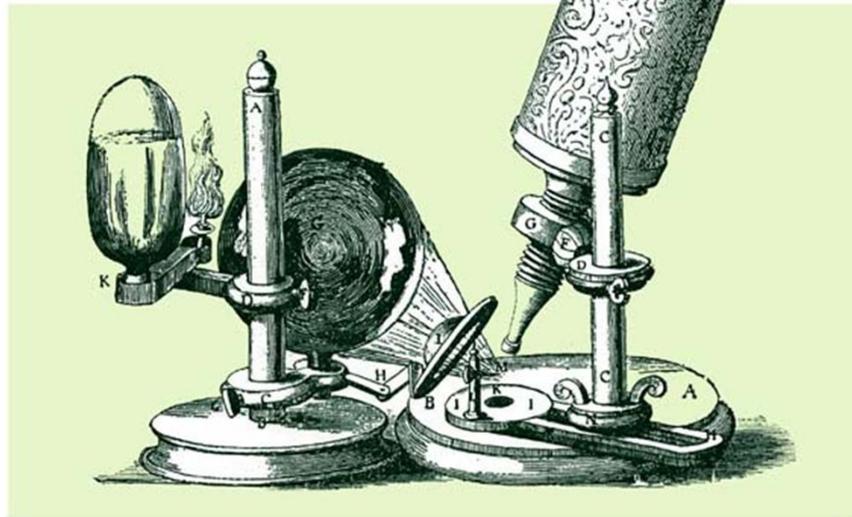


Robert Hooke

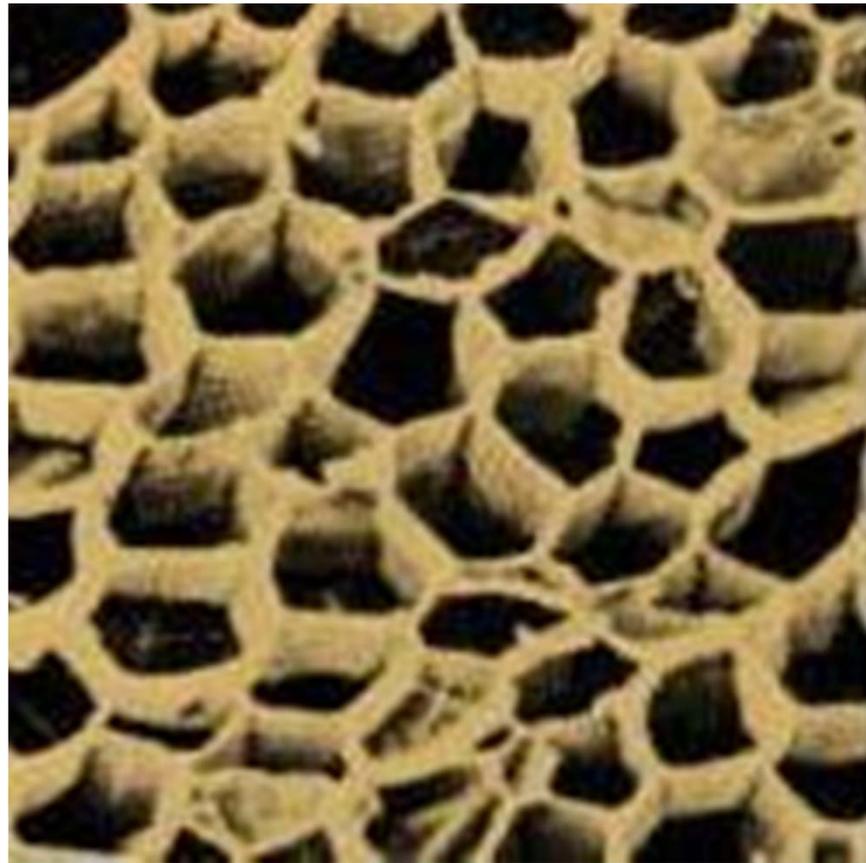
- 1635 - 1703
- Englishman
- developed an improved microscope
- observed small organisms
- 1665 - noted box-like structures in thin slice of cork
- viewed plant cell walls
- called cells
- reminded him of sleeping rooms in monasteries



Robert Hooke

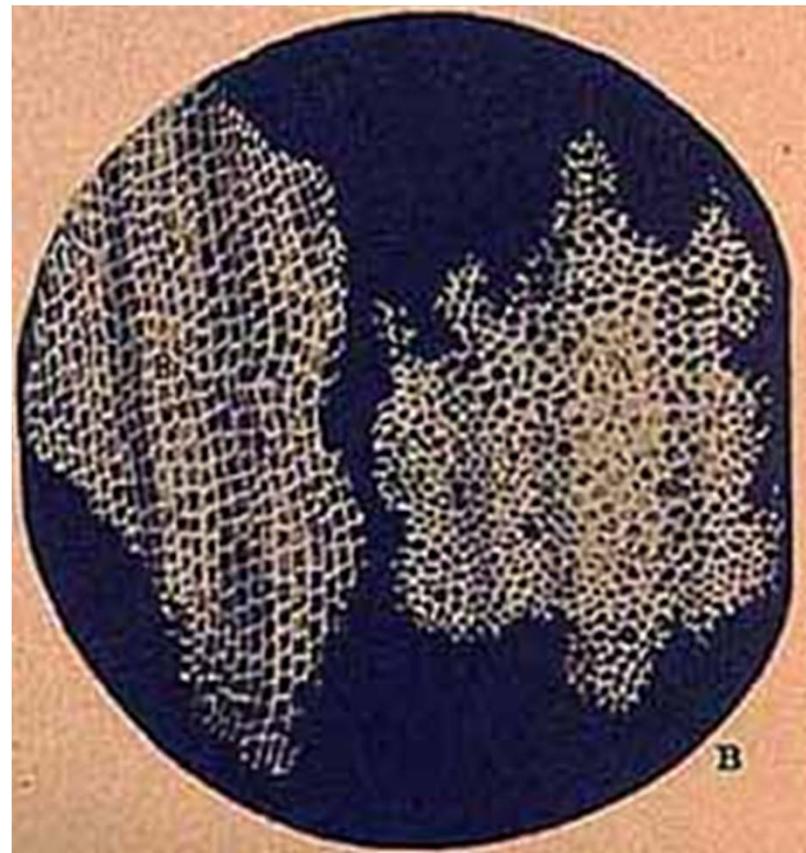


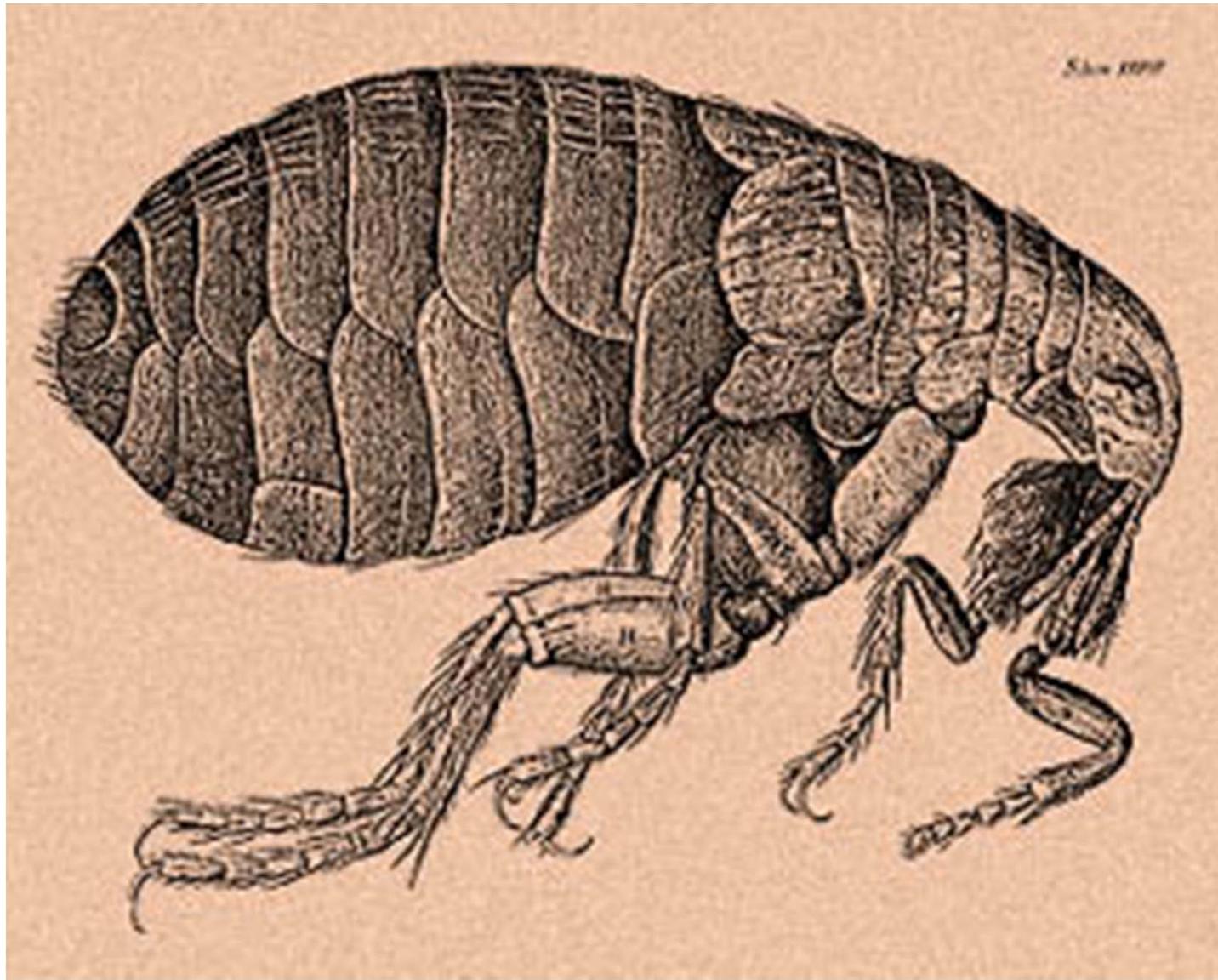
Robert Hooke



Robert Hooke

- Made drawings of his observations
- Drawing of cork - plant cell walls
- Published drawings in *Micrographia* in 1665





Robert Brown



- 1773 - 1858
- Scottish botanist
- discovered cell nucleus

Matthias Schleiden



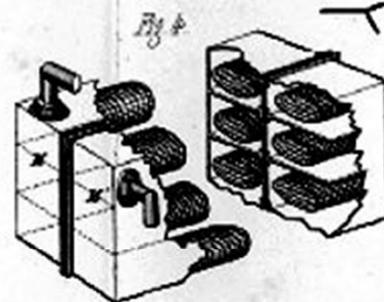
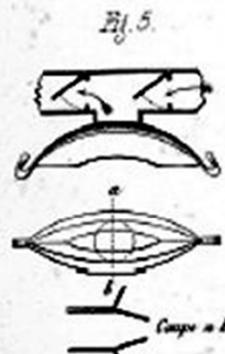
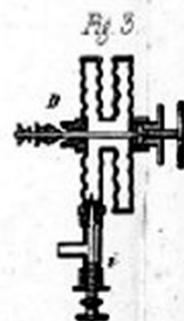
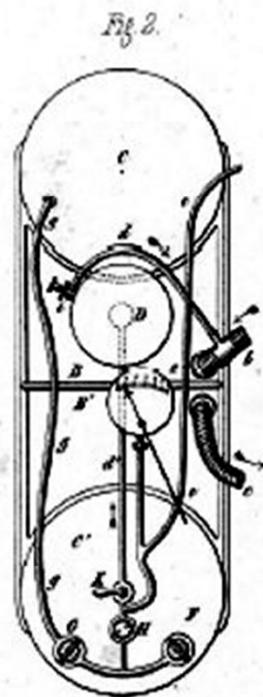
- 1814 - 1881
- German
- Studied plant structure under microscope
- Proposed that all plants composed of cells
- Co-founder of Cell Theory

Theodor Schwann



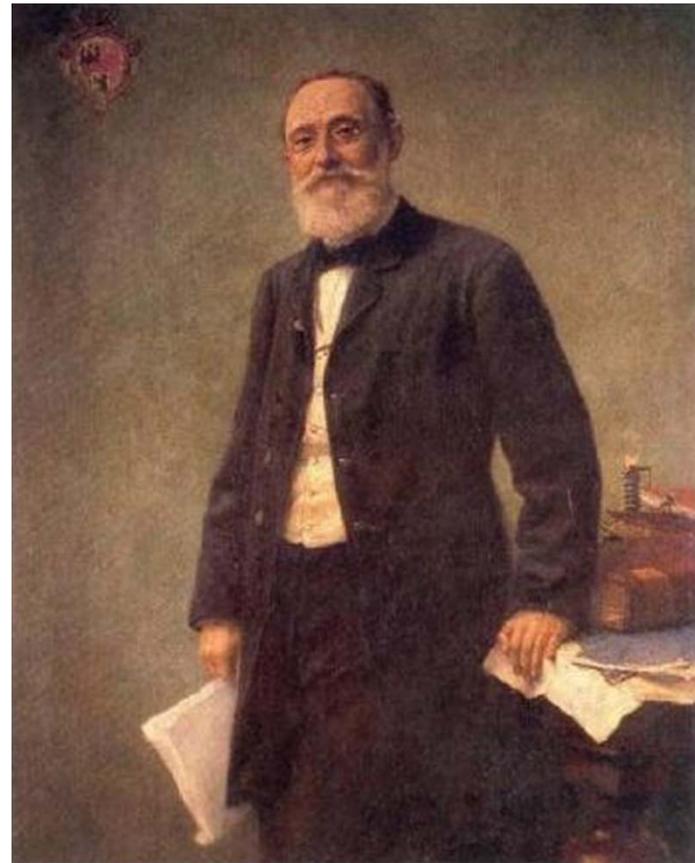
- 1810 - 1882
- Examined animal tissue
- Observed structures similar to what Schleiden observed in plants
- Stated that all living things were made of cells
- Co-founder of Cell Theory

APPAREILS AEROGÈNES DE M. SCHWANN.



Rudolf Virchow

- 1821 - 1902
- German
- doctor
- showed that cells are result of division of preexisting cells



Rudolf Virchow

- Virchow's idea contradicted the idea of spontaneous generation (idea that nonliving things could give rise to organisms)
- Also, developed a standard method of autopsy that is still used today

Cell Theory

The combined work of Schleiden, Schwann, & Virchow is known as the Cell Theory.

What were their contributions to Cell Theory?

- Schleiden
- Schwann
- Virchow

What were their contributions to Cell Theory?

- Schleiden - All plants composed of cells
- Schwann - All living things composed of cells
- Virchow - Cells are result of division of preexisting cells

Three Basic Principles of Cell Theory - Review

- A. All living things are made of one or more cells.
- B. Cells are the basic unit of structure & function in living things.
- C. Cells come only from the reproduction of existing cells.

Two groups of cells

Cells can be divided into two groups:

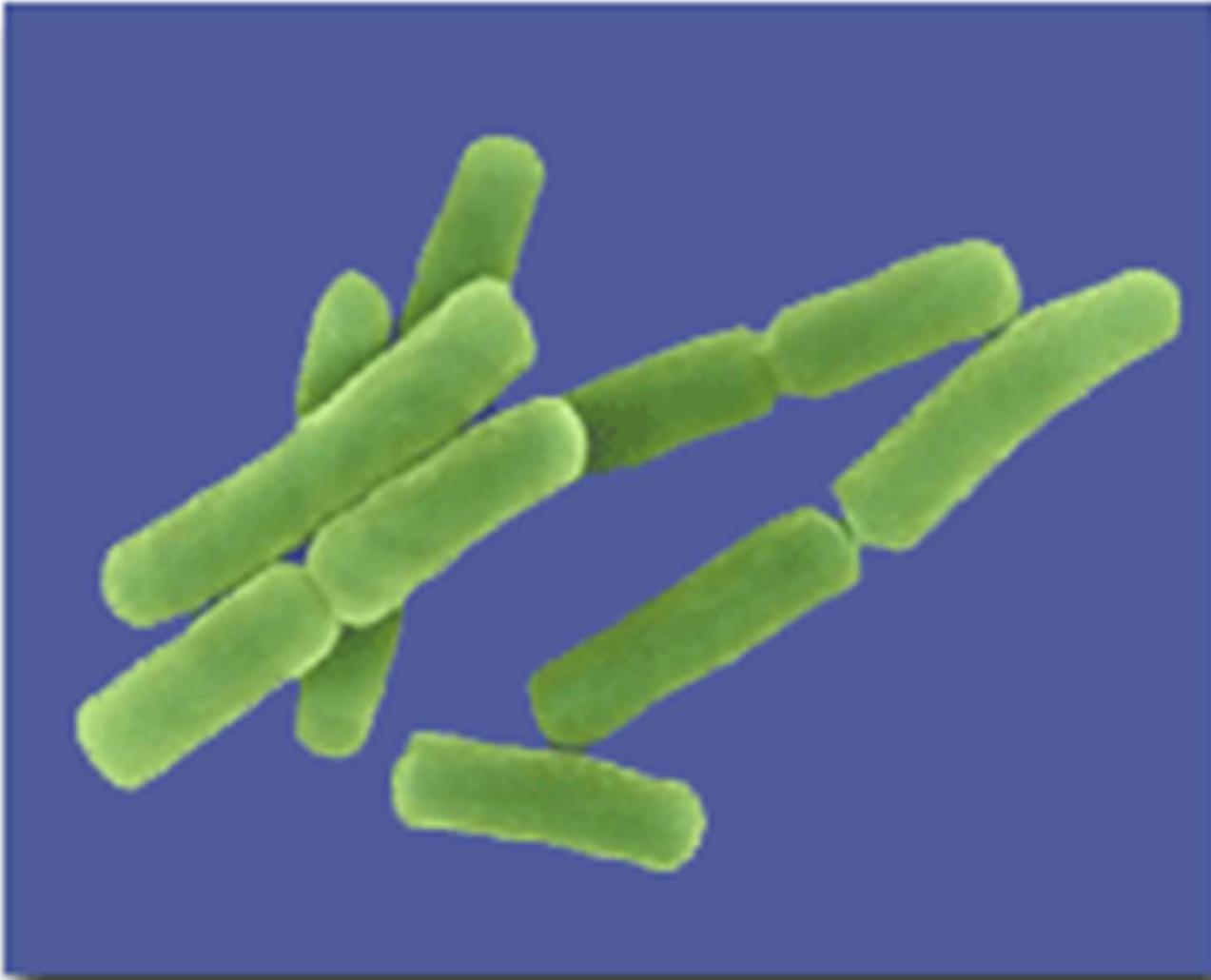
Prokaryotes and Eukaryotes

Prokaryotes Meaning

Pro = before Karyote = kernel or nucleus

- A. Do not have a nucleus
- B. Prokaryotic cells are generally smaller and less complex than eukaryotic cells
- C. Have genetic material (but it is not contained in nucleus)
- D. Carry out all activities of living things.

Example - bacteria



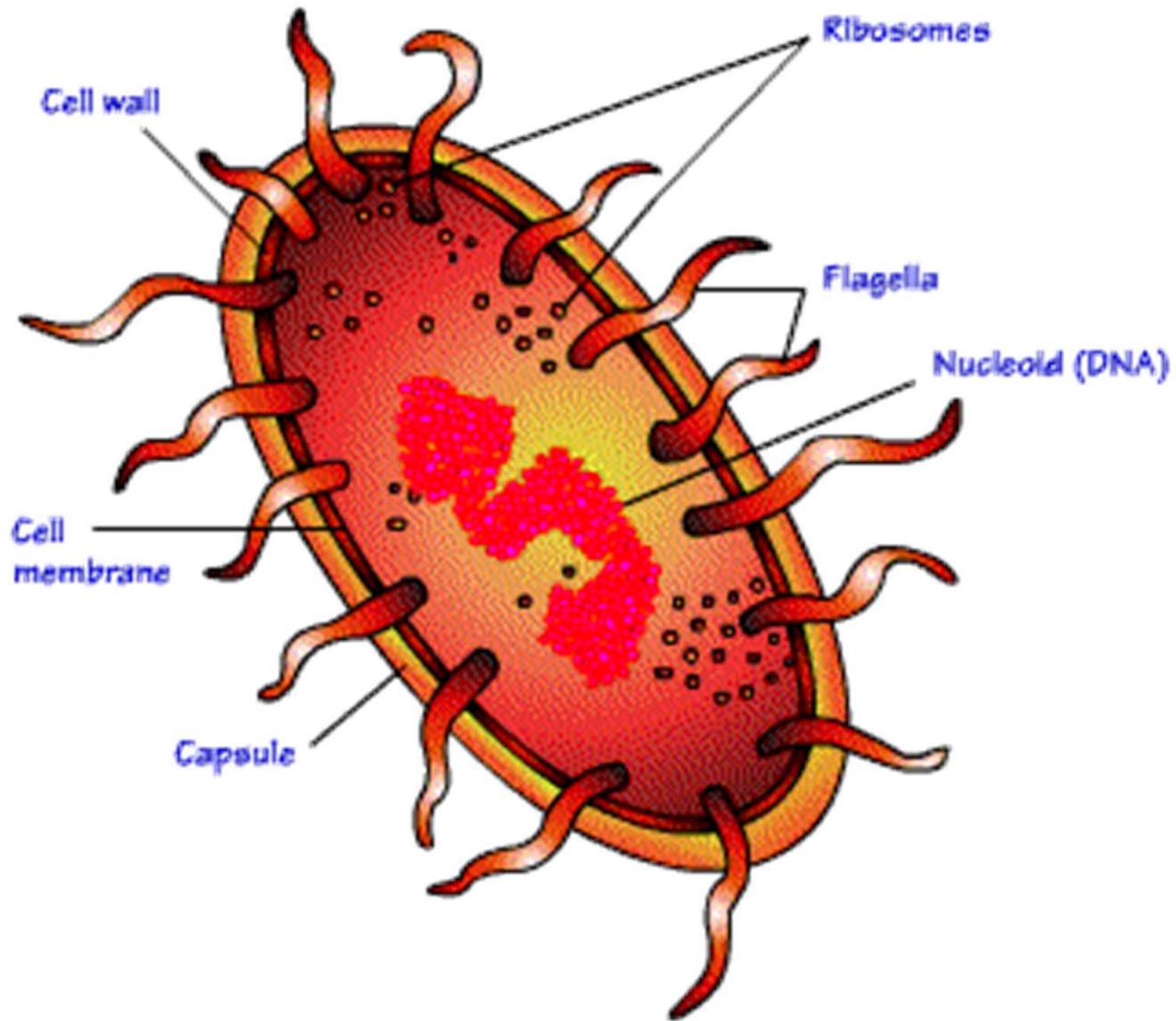
Bacillus Bacteria



***E. coli* Bacterium**



Salmonella Bacterium



Eukaryotes

eu = true karyote = kernel or nucleus

- A. Have a true nucleus
- B. Generally larger and more complex cells
- C. Have genetic material in nucleus
- D. Some are uni-cellular organisms
Others multi-cellular organisms
- E. Examples - plants, animals, fungi, protists

Plantae (plants)



Plantae (plants)

QuickTime™ and a
decompressor
are needed to see this picture.

Animalia (animals)



Animalia (animals)



Fungi



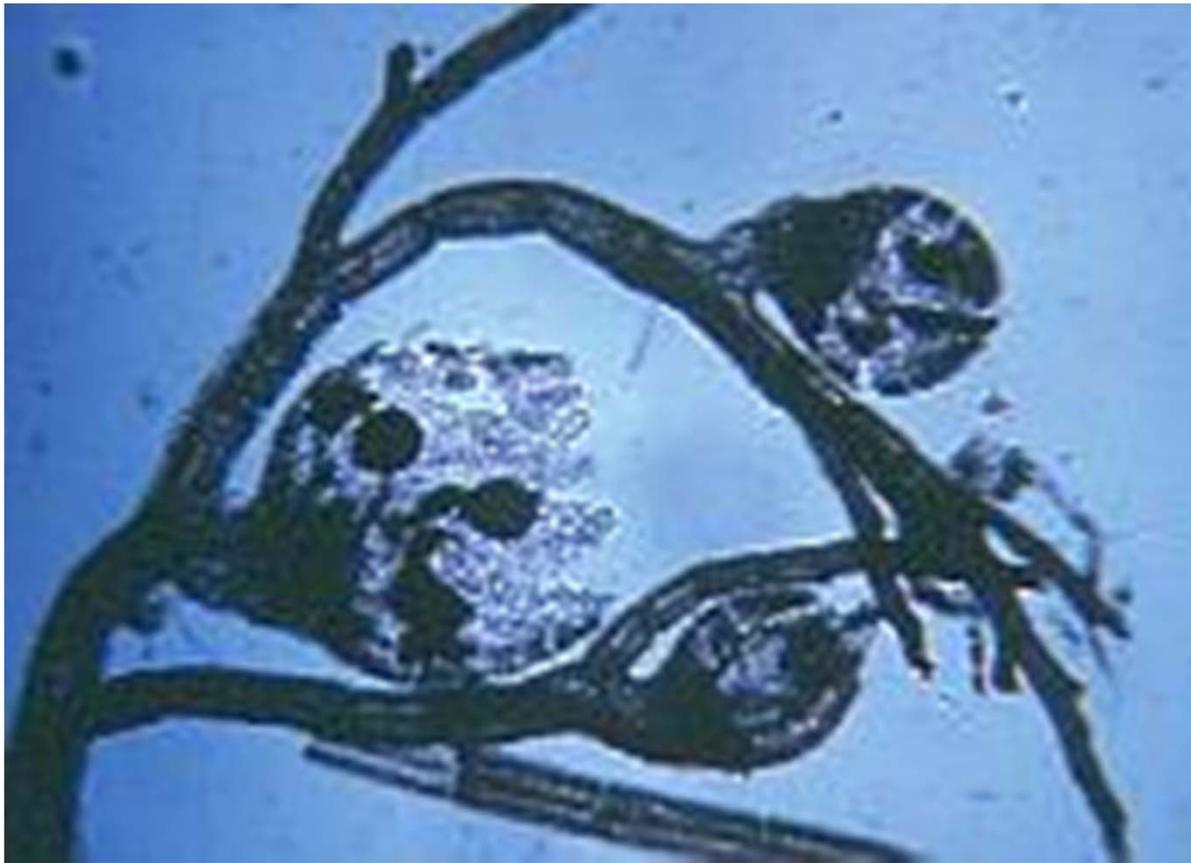
Fungi

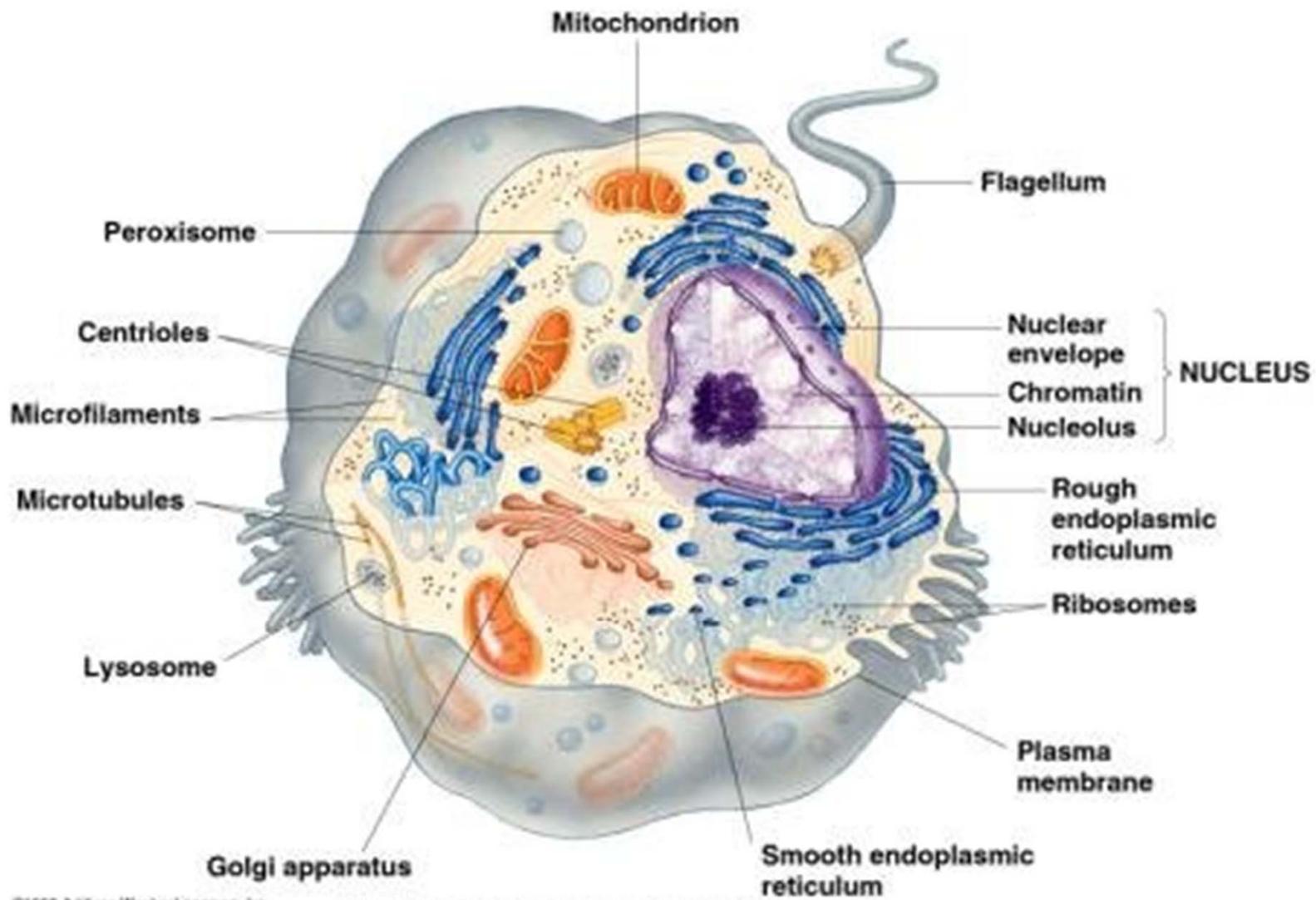


Protists (green Algae)



Protists (seaweed)





©1999 Addison Wesley Longman, Inc.

<http://fajerpc.magnet.fsu.edu/>

Review

- Major differences between prokaryote and eukaryote cells

Video