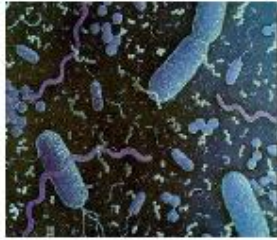


Microbiology

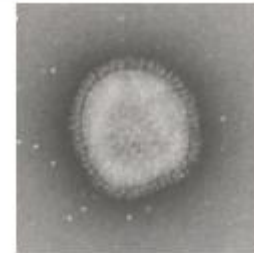
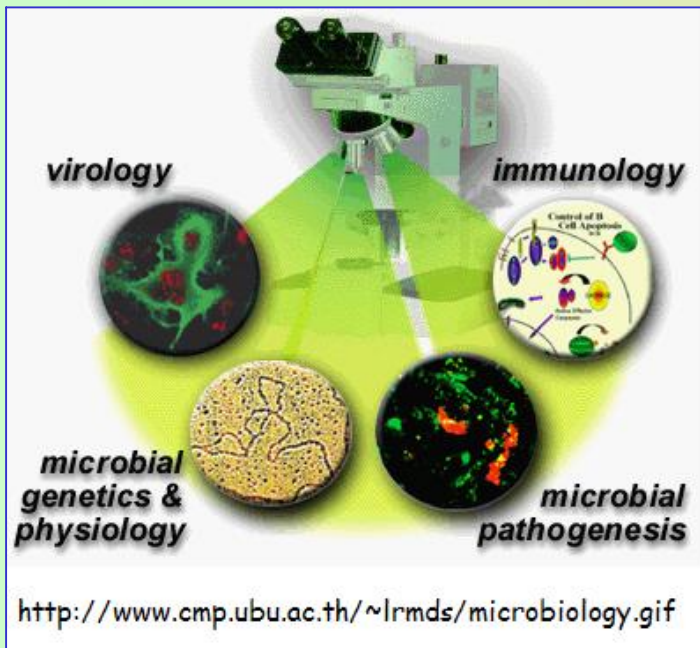


Antibiotic-resistant strains such as (MRSA) are becoming increasingly common.

http://www-images.warwick.ac.uk/fac/sci/bio/prospective_undergrads/courses/micvir/microbiology.jpg?maxWidth=200&maxHeight=165

Object of study

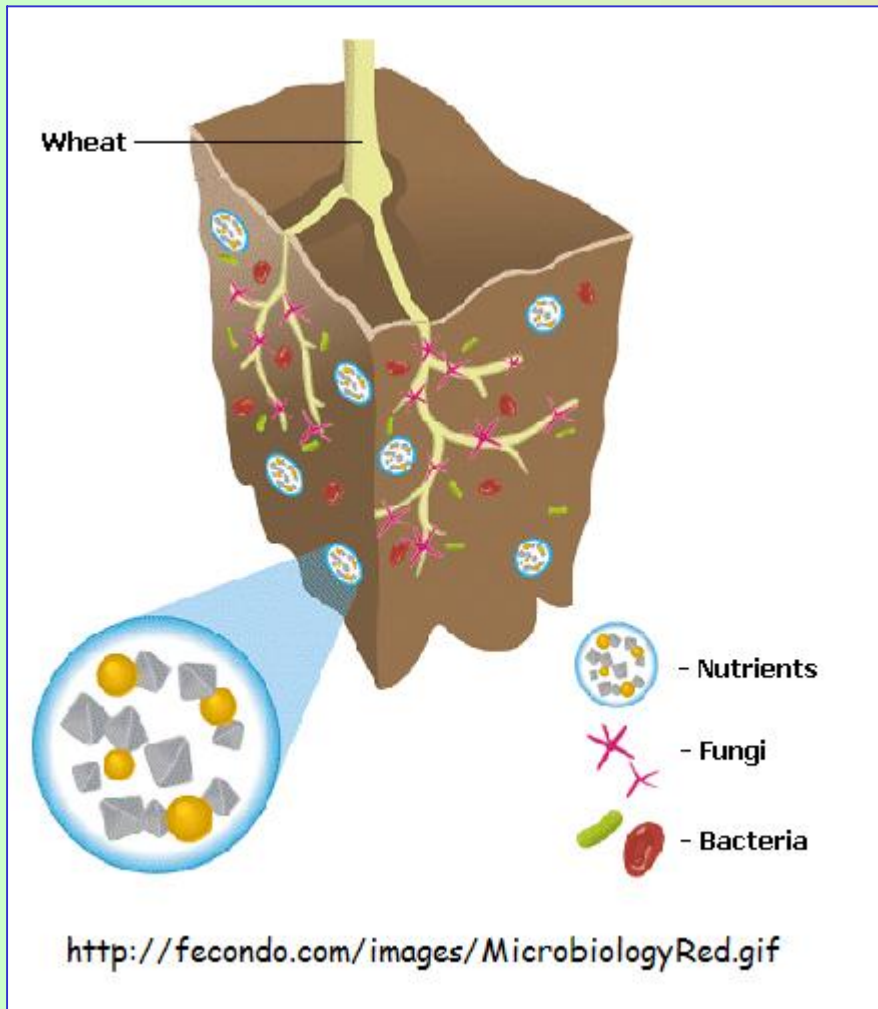
Microbiology is concerned with organisms that consist of **one cell**, or a cluster of **very few similar cells**, which do not develop into more complex aggregations of dissimilar cells.



An Influenzavirus particle, as seen by electron microscopy.

<http://www2.warwick.ac.uk/fac/sci/bio/ug/courses/micvir/nonflu3.jpg>

Microbiology



Object of study

Microbiology studies the following five great groups of unicellular or non-cellular living things and the group of prions:

- algae (alga)
- protozoa (protozoon)
- fungi (fungus)
- virus (virus)
- bacteria (bacterium)
- prions (prion)

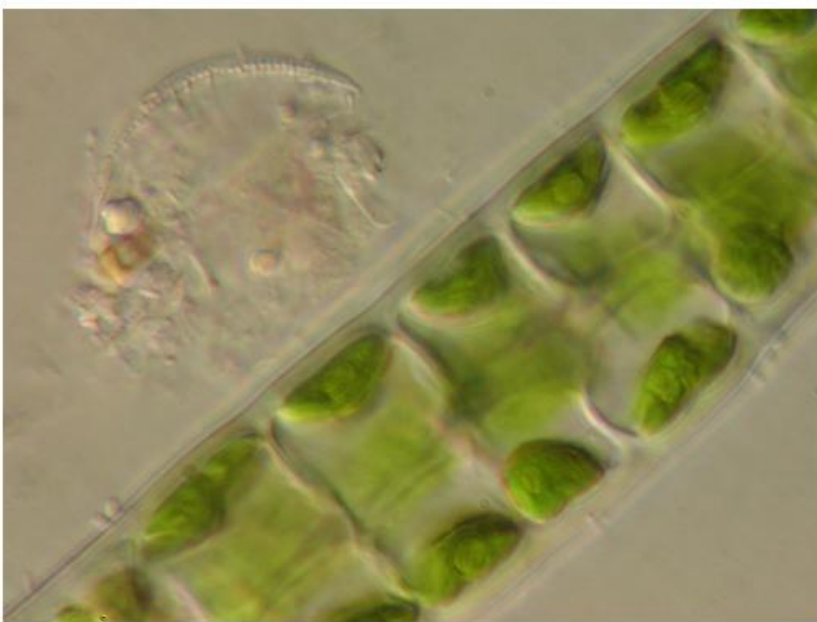
Microbiology

Algae

They are unicelular plants (multicellular algae are studiend by botanists).

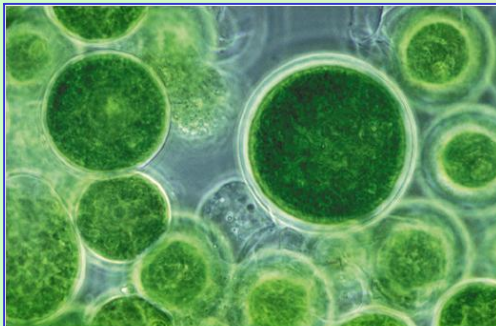
The cells are green due to chlorophyll, contained in a portion of the cell called the chloroplast.

There is a nucleus and a cell wall is composed of cellulose.

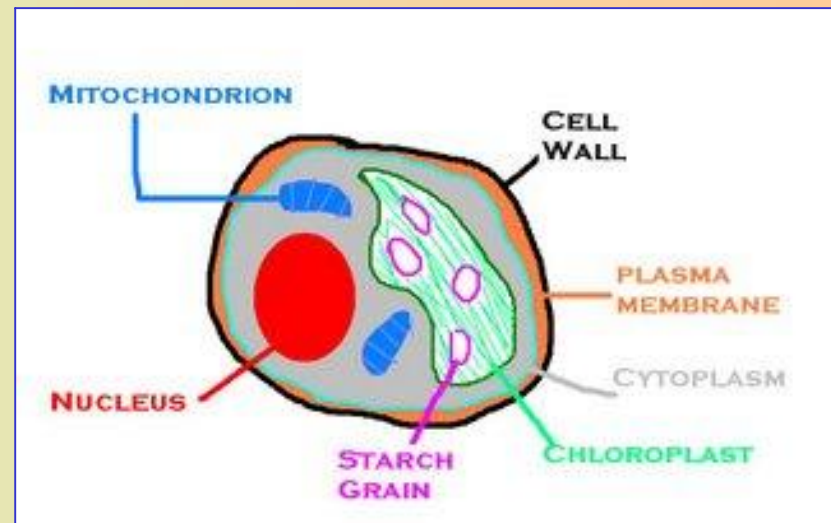


A filamentous alga. Cells and chloroplasts are clearly visible inside the cell walls. Photomicrograph taken with a Coolpix 885 at 3x zoom, using an Olympus microscope equipped with Hoffman Modulation Contrast optics, oil immersion at 1,000x magnification. Algae are Eukaryotes and probably first appeared in the order of 1.5-billion years ago.

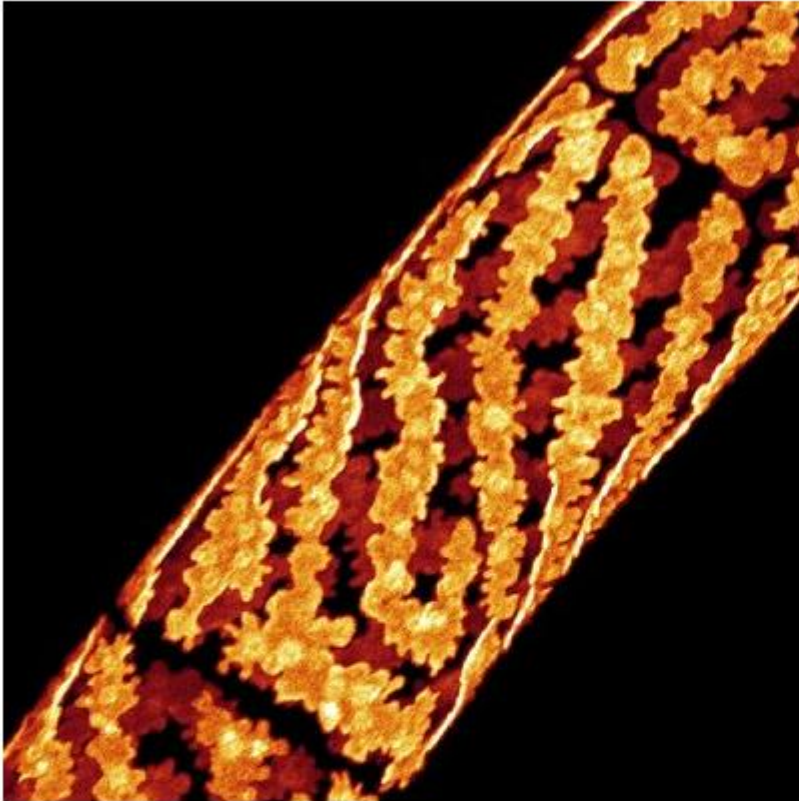
http://farm1.static.flickr.com/152/403178949_1d9ff4fb8b.jpg?v=0



http://www.scribemedia.org/wp-content/uploads/2007/10/igb_alge2.jpg



Microbiology



Algae

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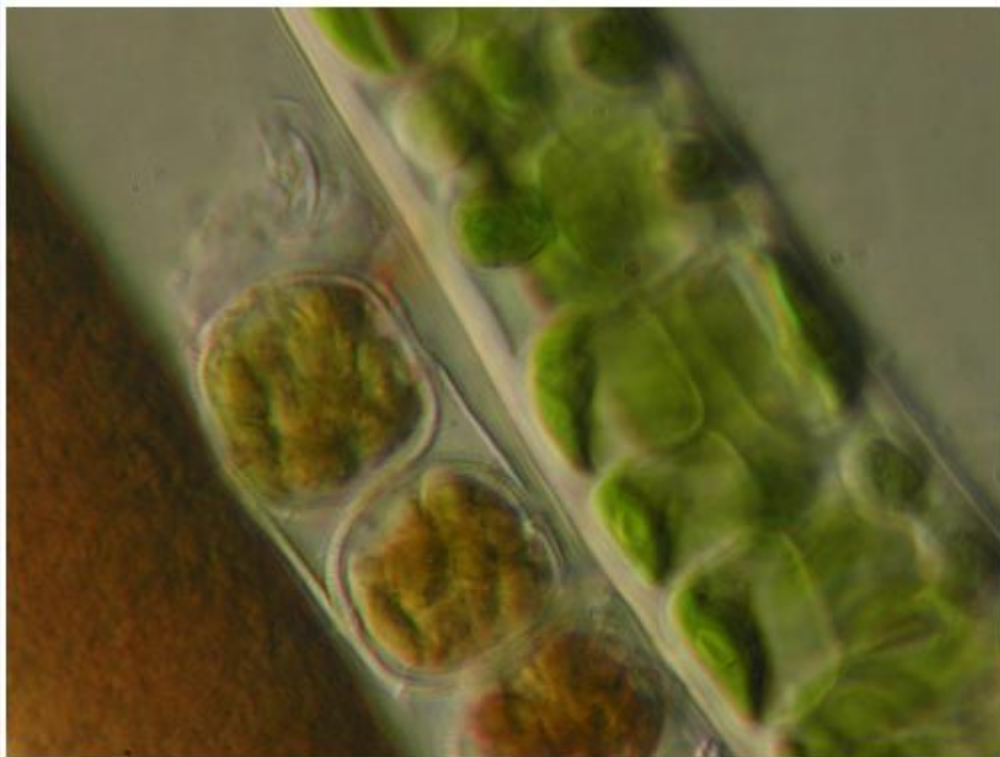
The cells are green due to chlorophyll, contained in a portion of the cell called the chloroplast.

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Spirogyra crassa: Three-dimensional arrangement of chloroplast bands in the peripheral cytoplasm (micrograph by Silke Lehmann). Dr. Franz Grolig investigates two aspects of organelle movement, i.e. transport and positioning, in members of the charophycean green algae, *Spirogyra*, *Mougeotia* and *Chara*, a group closely related to the ancestors of higher plants. The research focusses on the contribution of microfilaments and microtubules to the cytomechanics of central nuclear positioning and of (light-mediated) chloroplast positioning in *Spirogyra* (*Mougeotia*).

http://www.uni-marburg.de/fb17/fachgebiete/pflanzenphysio/pflanzenphysiologie_I/pictures/index/spirogyra/image_preview

Microbiology



A filamentous alga, three cells of the colonial diatom Melosira, and a Cyanobacterial filament on the left. Cells and chloroplasts are clearly visible inside the cell walls of the alga. Photomicrograph taken with a Coolpix 885 at 3x zoom, using an Olympus microscope equipped with Hoffman Modulation Contrast optics, oil immersion at 1,000x magnification.

http://farm1.static.flickr.com/162/403178951_164a1ea3f6.jpg?v=0

Algae

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Microbiology

Green aquarium water is caused by free-floating single celled green algae. With the correct conditions single cell green algae is very prolific. So prolific that there are literally billions and billions of the green algae free-floating in your aquarium water, enough to cause your water to turn green

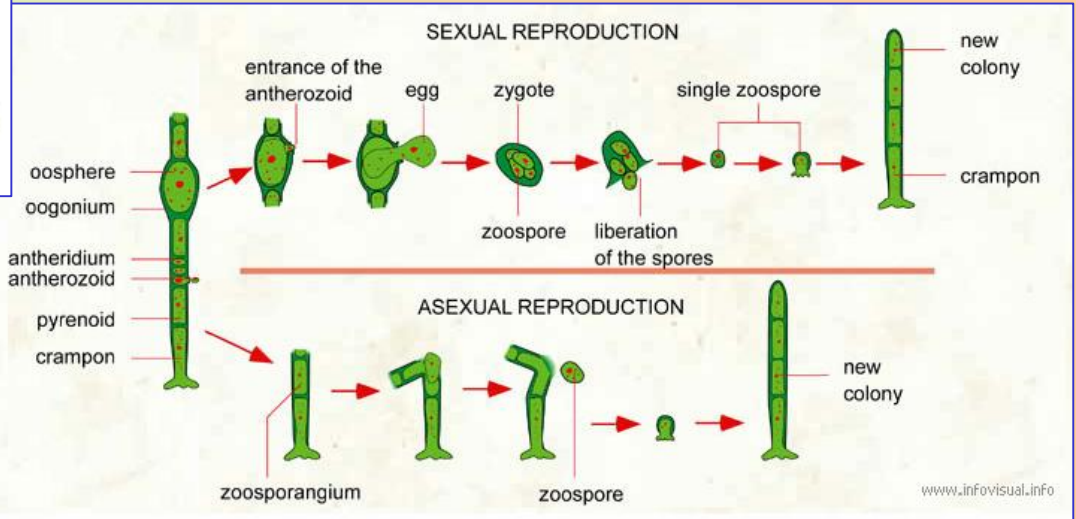


Thanks to <http://flickr.com/photos/nattarbox>

<http://newaquariuminformation.com/pictures/greenaquarium.jpg>

Green algae

The green algae need light to grow (like plants), and with it they convert carbon dioxide into sugars and starch and so they multiply.



http://www.infovisual.info/01/img_en/022%20Reproduction%20of%20green%20algae.jpg

Microbiology



Paramecium

<http://upload.wikimedia.org/wikipedia/commons/thumb/c/cb/Paramecium.jpg/300px-Paramecium.jpg>

Protozoa

They are single-celled creatures.

Most protozoa do us no harm. But there are a few that cause diseases. One type of **amoeba** can live in human intestines.

It feeds on red blood cells and causes a disease known as **dysentery**. Another species of protozoa can sicken hundreds of thousands of people when it gets into the tap water. Perhaps the best-known deadly protozoa causes **malaria**, a terrible disease that leads to about 800,000 deaths each year worldwide

Microbiology



Fungi

Moulds (mould/mold), mildews and yeasts are very important.

A common bread mould, neurospora, give the characteristic colour to mouldy bread.

They are heterotrophs: they need organic material to grow and are therefore normally found on decaying organic matter.



Microbiology

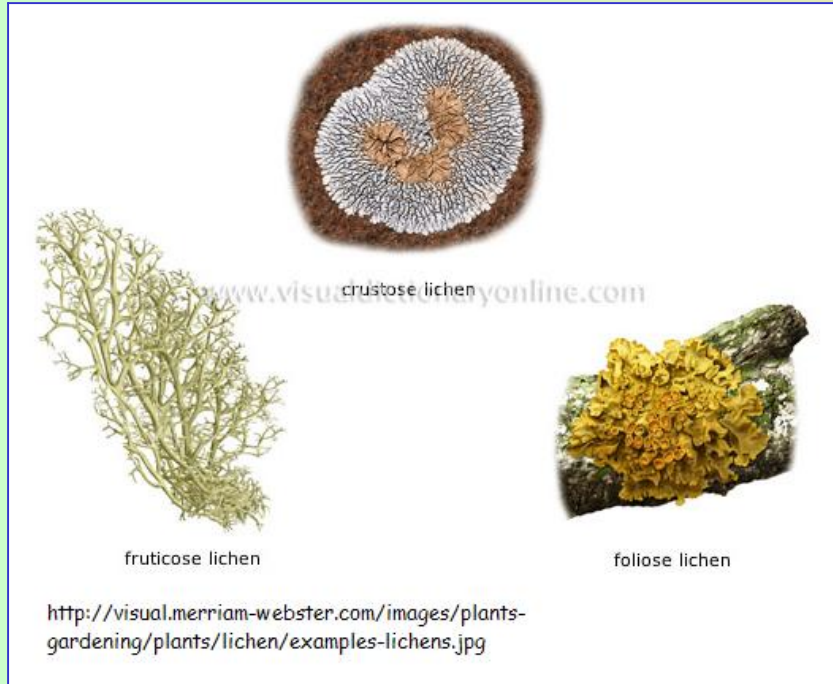
Lichens

Lichens are **symbiotic associations** of a **fungus** with a photosynthetic partner that can produce food from sunlight.

The partner is usually a **green alga** or **cyanobacterium**.



http://upload.wikimedia.org/wikipedia/commons/thumb/7/77/N2_Lichen.jpg/800px-N2_Lichen.jpg



fruticose lichen

foliose lichen

<http://visualmerriam-webster.com/images/plants-gardening/plants/lichen/examples-lichens.jpg>

Microbiology



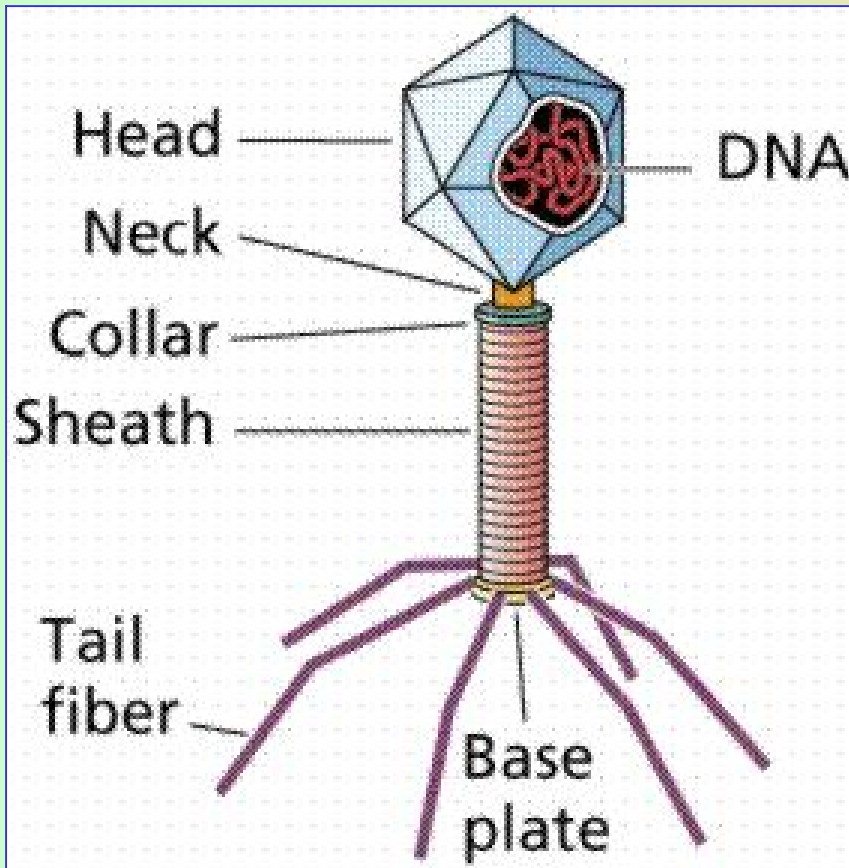
http://www.bbc.co.uk/schools/gcsebitesize/science/images/sp1_hepatitis_c_virus.jpg

Virus

They are between ten and hundred times smaller than bacteria.

They are the major causative agent of diseases: most of the bacterial diseases are now under control, but the viruses remain largely unconquered.

Microbiology



<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/T2phage.gif>

Virus

Virus are responsible for many diseases: poliomyelitis, common cold...

They also attack bacteria, and such viruses are called bacteriophages.

Virus lie on the borderline of living things: they have no metabolism; when they infect a creature, they pervert its own metabolism so that it synthesizes more of the virus.