

Chapter 21-~~2~~¹ Viruses

Which are diseases caused by viruses and which bacteria?

Mumps

Syphilis Tuberculosis

Lyme disease

Polio

Influenza

AIDS

Common cold

Botulism

Strep throat

Chickenpox

Bubonic plague

Are viruses living?

We know.....

All living things are made of cells, able to grow and reproduce, and guided by their DNA.



So it seems like yes, BUT

They need cells to do these things so
scientists do not consider them living.

Viruses - segments of nucleic acids
contained in a protein coat.

Range from 20nm to 250nm.

Only been seen with an electron microscope.

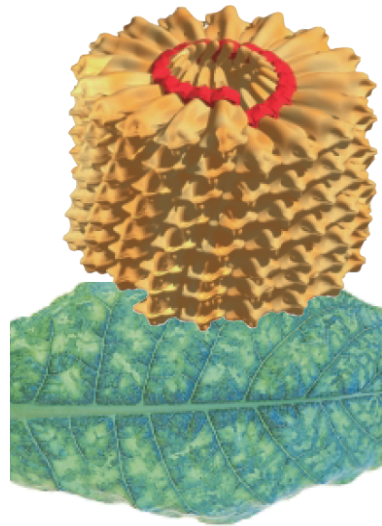
<http://htwins.net/scale2/>



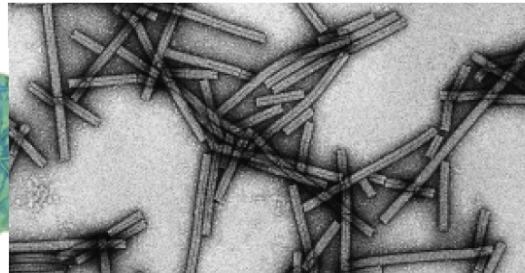
What was one of the main plants
in the south around the 1800's?

Tobacco

Scientists were trying figure out what was causing a disease that stunted the tobacco plant growth. They knew it was something smaller than a bacterium.



Tobacco Mosaic Virus



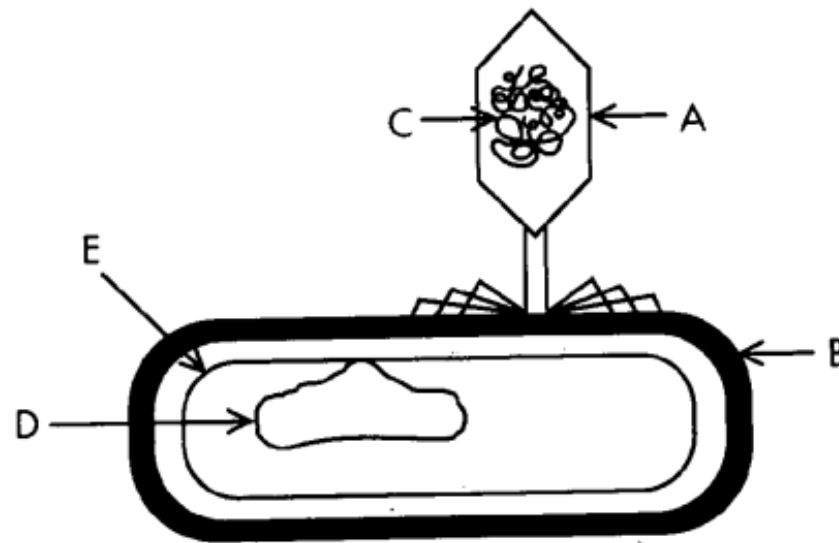
They called it a virus
because that is the Latin
word that means poison.

They were thought to be tiny cells until
1935 when they purified
the virus. They then thought it was a
chemical not a cell.

Capsid - protein coat contain either RNA or DNA. Σ

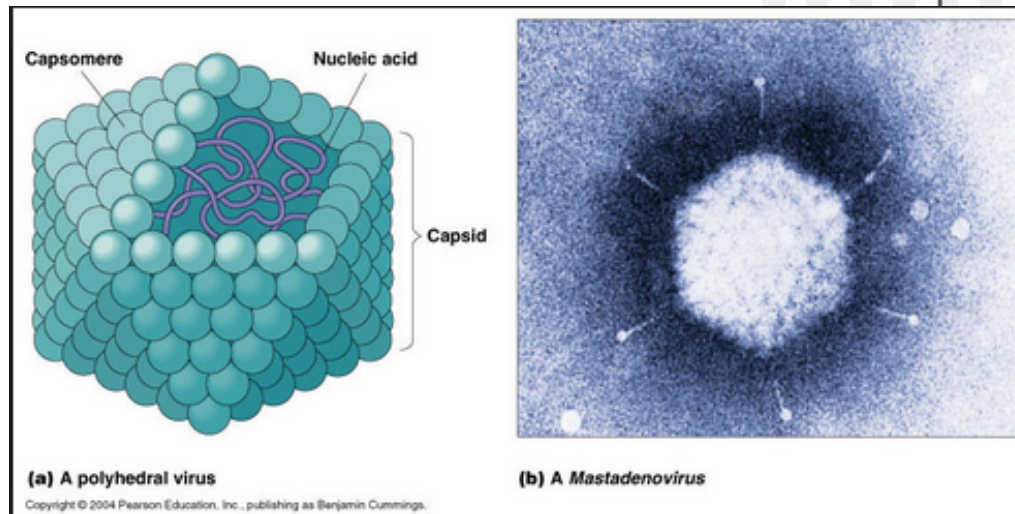
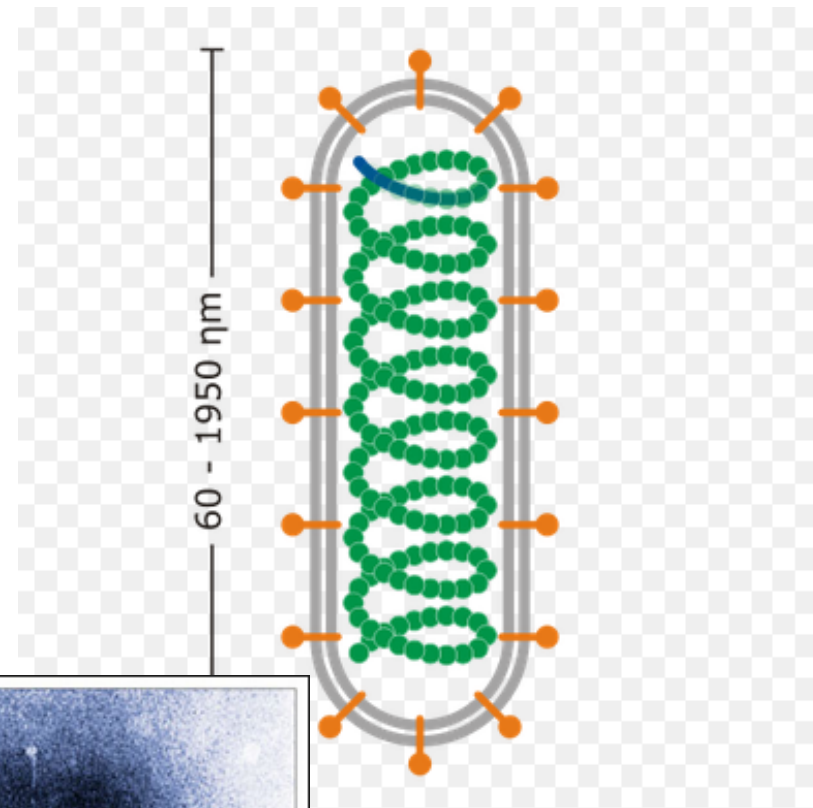
Envelope - a membrane that surrounds the capsid in some viruses.

B

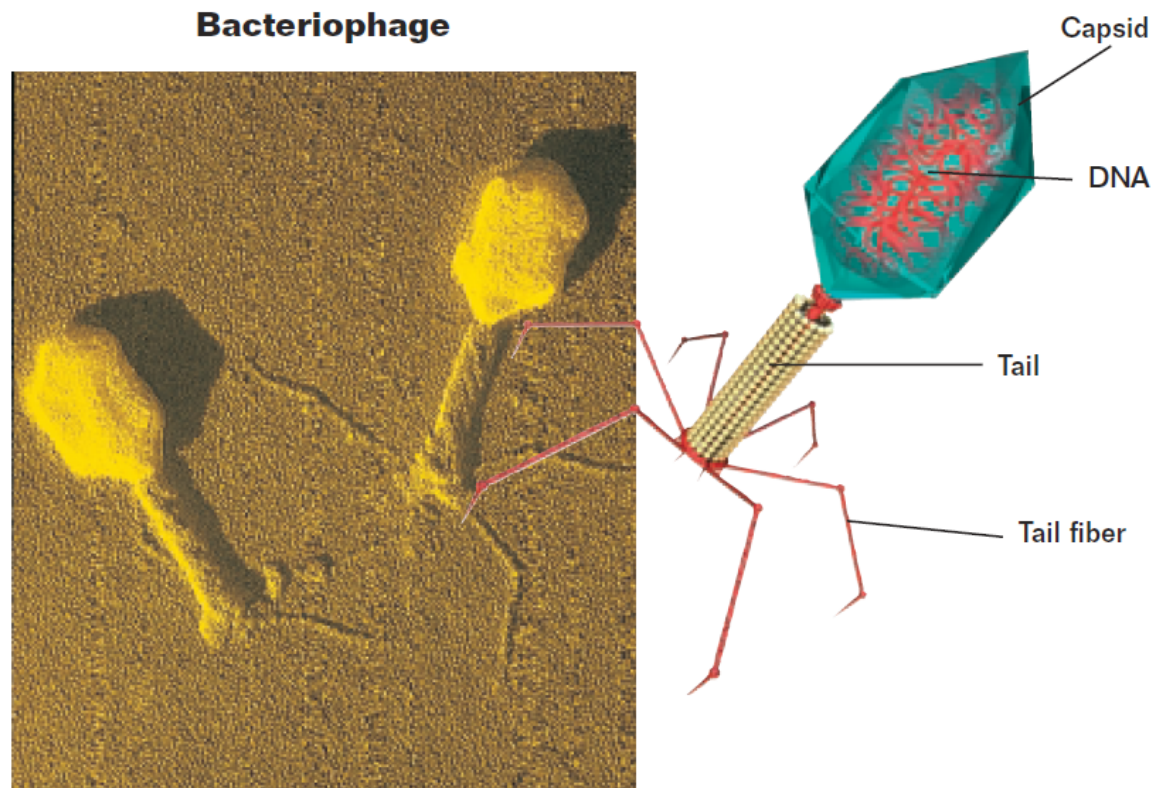


Helical

Polyhedral



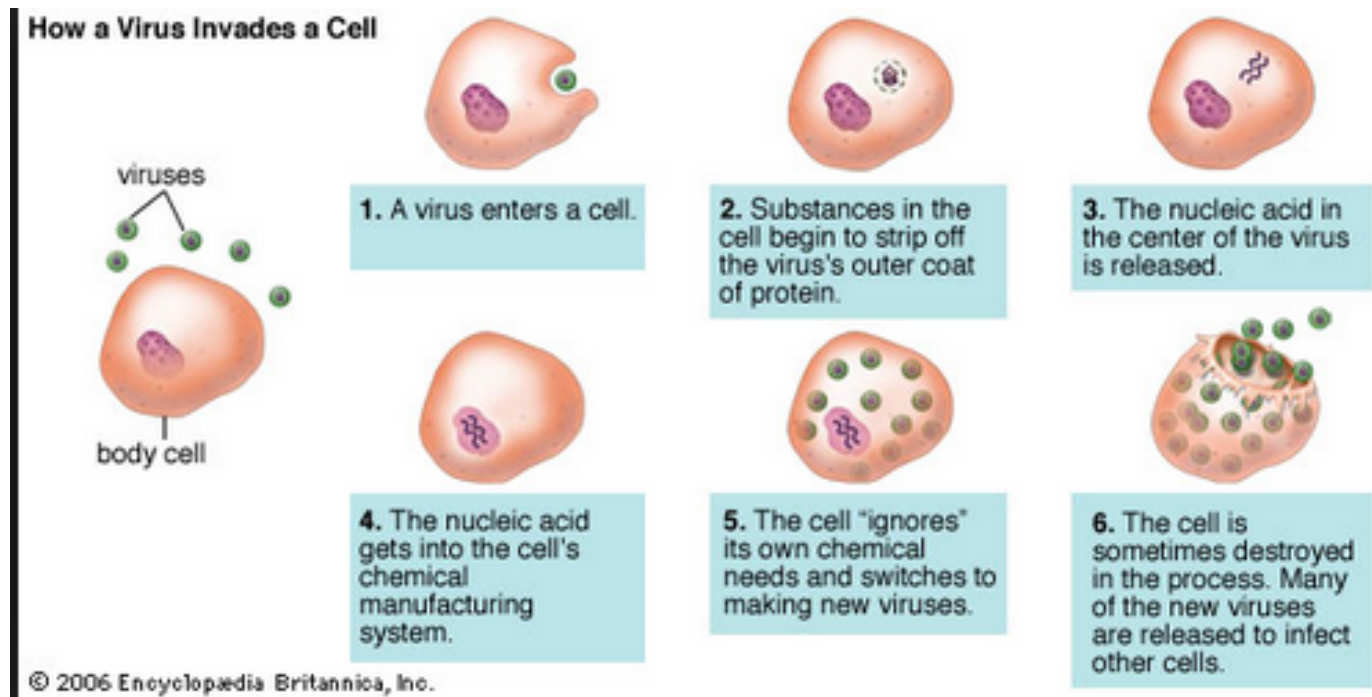
Bacteriophage- viruses that infect bacteria;
This is a polyhedron Capsid with a helical tail



Viruses Replicate inside Living Cells.

They must rely on a host because they cannot metabolize or make protein

In order for a virus to replicate it must first infect a cell.

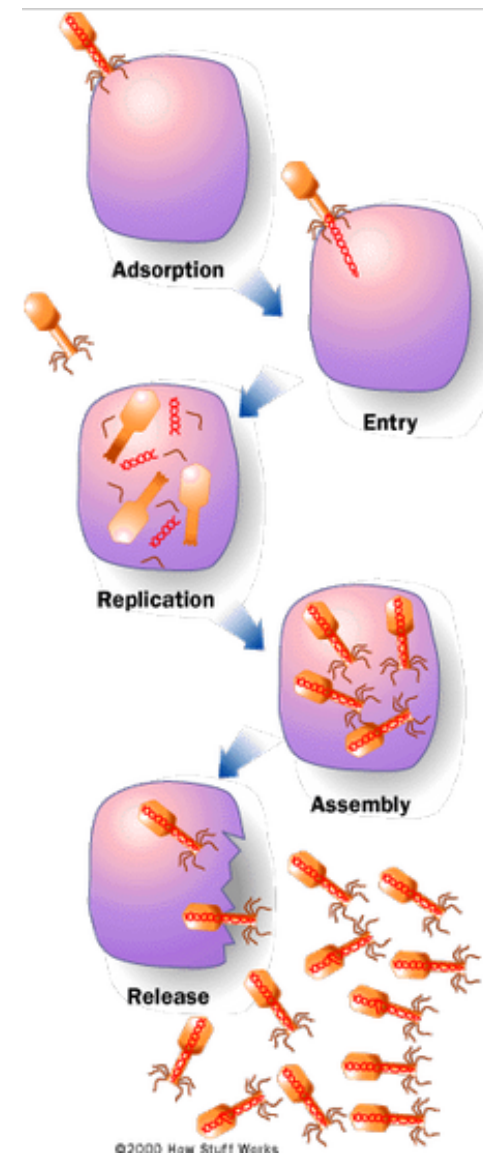


Lytic Cycle

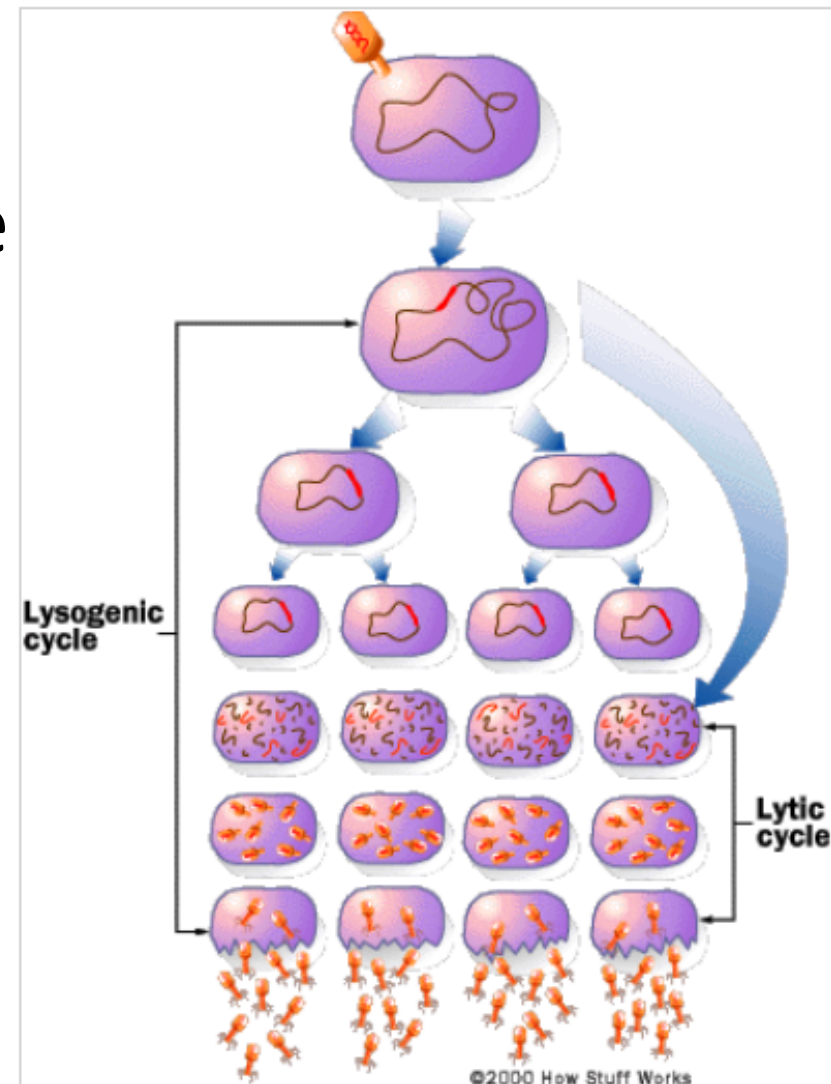
When a virus enters cells
it does not always
harm a cell.

After it replaced
several hundred
times then the cell
bursts and is destroyed.

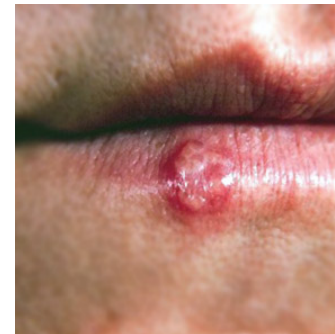
If enough tissue is damaged
it can affect an organ.

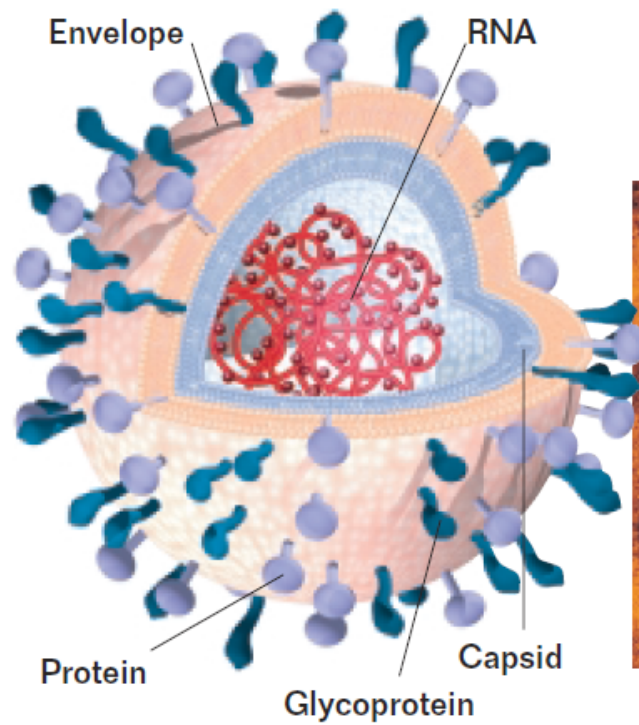


Lysogenic cycle- some viruses do not make new viruses but insert their DNA into the host cells DNA (provirus)

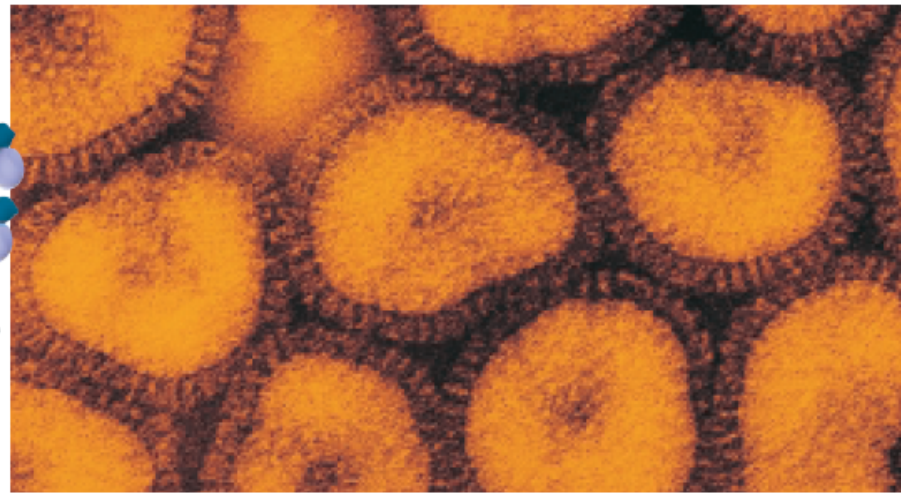


Viruses like to cold hide in the nerves of the face and then when something happens like Stress the virus starts to cause tissue damage like a cold sore or a fever blister.





Influenza Virus



Flu epidemic of 1918

http://en.wikipedia.org/wiki/1918_flu_pandemic



Disease	Transmitted by	Symptoms
Chickenpox	Air currents	Rash, fever
Measles	Air currents	Blotchy rash, high fever, congestion in nose and throat
Rubella (German measles)	Air currents	Rash, swollen glands
Mumps	Air currents	Swollen salivary glands
Influenza (flu)	Air currents	Headache, muscle aches, sore throat, cough; historically, one of the great “killer” diseases
Smallpox	Air currents	High fever, pustules on skin; often fatal; now eliminated
Infectious hepatitis	Contaminated food or water	Fever, chills, nausea, swollen liver, jaundice, pain in the joints
Polio	Contaminated food or water	Headache, stiff neck, possible paralysis
Yellow fever	Mosquitoes	Nausea, fever, aches, liver cell destruction; can be fatal
AIDS	Sexual contact, contaminated blood products, contaminated hypodermic needles and syringes	Immune system failure; fatal