Disease

CAUSES OF DISEASE

- fungi, viruses, bacteria → microbes → pathogens
- lice, fleas, worms → parasites
- direct contact, indirect contact → infectious diseases

(carried by vectors like mosquitoes, houseflies, rats, mice)

- poor nutrition
- ageing
- cancer
- inheritance
- mental illness
- chemical imbalance
- environmental conditions

→ non-infectious diseases

Keeping healthy

Disease

It is anything that makes you feel unwell, or makes you unable to function properly in a given environment.

Diseases

Infectious

caused by pathogens
can be transmitted from one person to another
Eg. Influenza, malaria

Non-infectious

not caused by pathogens
cannot be transmitted from one person to another
Eg. Osteoporosis, anaemia

Pathogens are disease-causing organisms.
Eg. Bacteria, virus, protozoa, fungi etc.

Many diseases are transmitted by direct contact

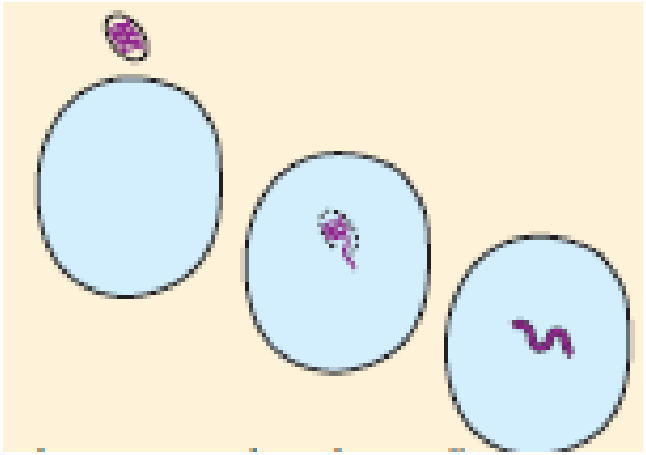
Type of pathogen	Description	Typical size	Example of diseases
Bacteria	• single-celled organisms • DNA is not contained inside a membrane-bound nucleus	0.2–5 µm	Scarlet fever, meningococcal meningitis, impetigo, tuberculosis, leprosy, some throat and middle ear infections
Viruses	• piece of DNA or RNA wrapped in a protein coat • cannot reproduce unless inside a host cell	20–300 nm	AIDS, influenza (the flu), hepatitis, SARS, measles
Protozoans	• single-celled organisms • DNA is inside a membrane bound nucleus.	2–200 µm	Malaria, toxoplasmosis, amoebic dysentery, cryptosporidium, malaria

Fungi	• one or more cells that have a cell wall • true nucleus and no chloroplasts.	Varies from 50 µm to much larger (e.g. mushrooms)	Athlete's foot Thrush, ringworm, athlete's foot, onychomysis (a fungal infection of the toe nails)
Macroparasites	Macroparasites can be seen without a microscope.	Size varies greatly but can be seen without a microscope	Head lice infestation, flea infestation, elephantitis (caused by a nematode worm)
Prions	Prions are thought to be incorrectly folded proteins.	10–200 nm	BSE (bovine spongiform encephalitis, also known as mad cow disease), fatal familial insomnia, Creutzfeldt–Jakob disease, kuru

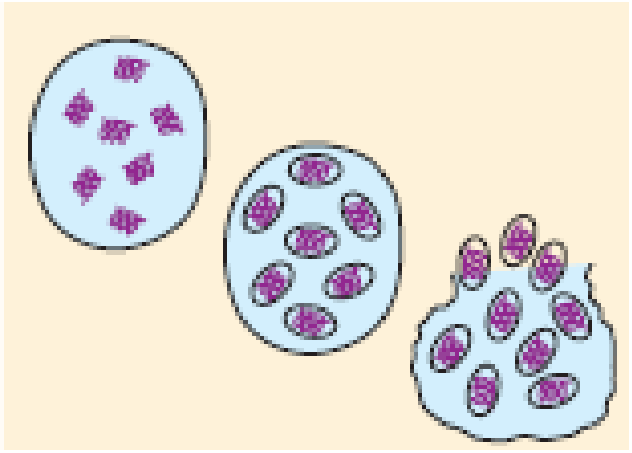
Type	Appearance	Examples
cocci (singular: coccus)		coccidiosis
diplococci		gonorrhoea
streptococci (chains)		tonsillitis
tetrads (groups of 4)		sarcina
clusters		staphylococcus
bacilli (rods)		diphtheria, typhoid
spirilla (spiral forms)		syphilis

Common bacteria shapes

Electron micrograph of rod-shaped *Salmonella* bacteria (bacilli).



The virus invades a host cell

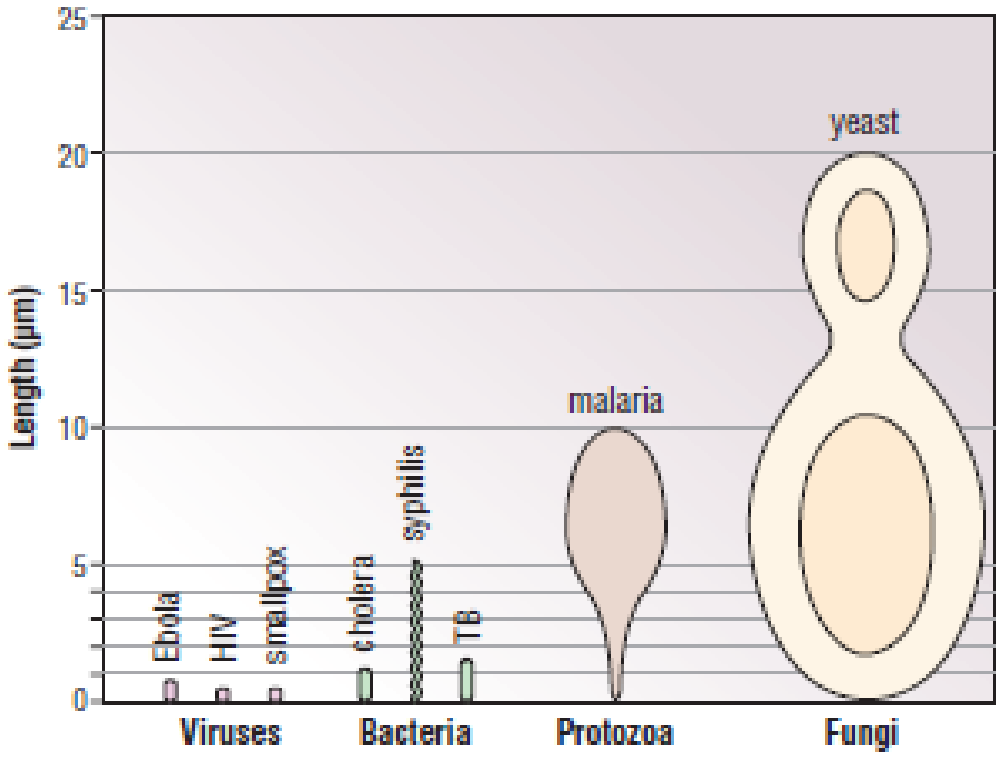


The virus instructs the host cell to make many copies of it. Then the host cell breaks open. Viruses move into the bloodstream to invade other cells.

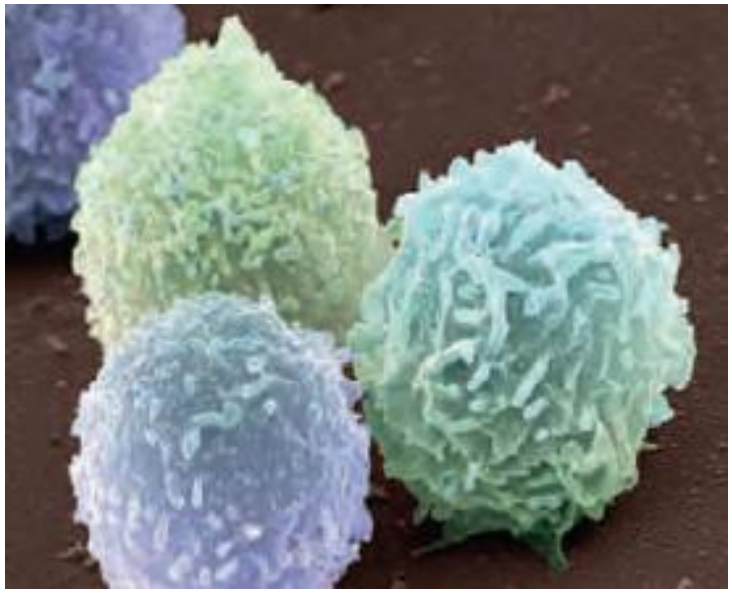
How a virus reproduces

An *Anopheles* mosquito, capable of carrying malaria, biting into human skin

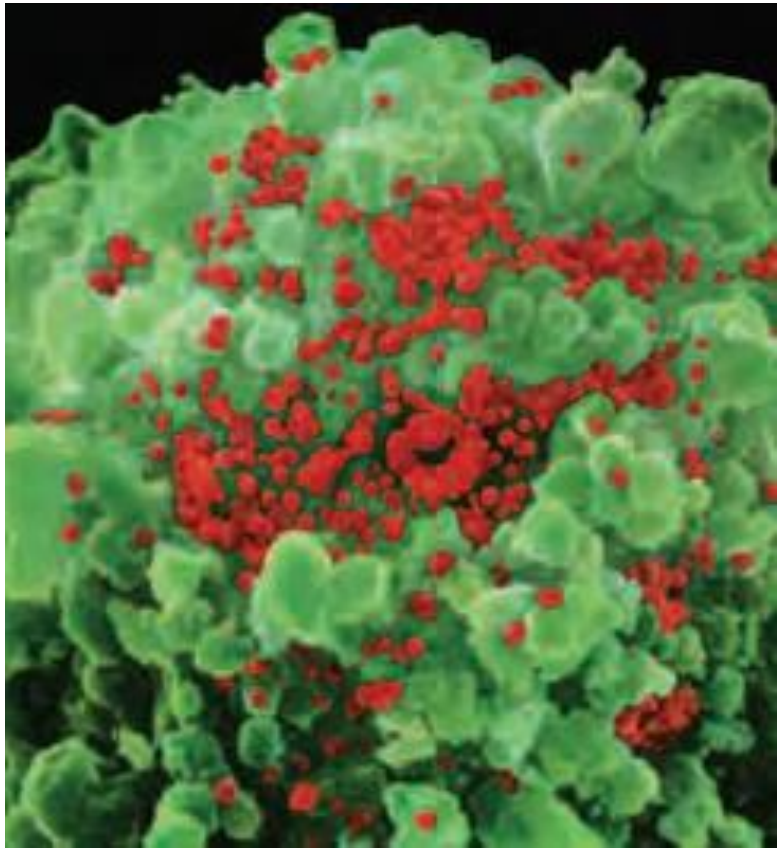
Electron micrograph of a parasitic tapeworm showing suckers and hooks used to attach to the intestine



Relative sizes of some viruses, bacteria, protozoa and fungi



Normal leucocytes, or white blood cells that fight disease



The surface of a T cell (green) infected with HIV (red), the agent that causes AIDS

A **host** is the organism being affected by the agent.

A **parasite** is an agent that uses the host for food or shelter.

INFECTIOUS DISEASES

Infectious diseases can ususally be passed from one person to another and are caused by pathogens

TYPES OF PATHOGEN AND THE DISEASES THEY CAUSE

Viruses	Bacteria	Fungi	Protozoa & Parasites
• Common cold	• Plague	• Tinea	• Malaria
• Influenza	• Cholera	• Ringworm	• Amoebic dysentery
• Smallpox	• Tuberculosis	• Thrush	• Giardia
• AIDS	• Gonorrhoea	• Candida	• Cryptosporidium
• Polio	• Meningococcol disease		•
• Hepatitis B	• Typhoid		• Tapeworm
• Hepatitis C	• Scarlet fever		• Liver fluke
• Rubella	• Diptheria		• Bilharzia
• Chicken pox	• Whooping cough		
• Measles	• Anthrax		
• Mumps	• Cystitis		
• Hemorrhagic fever (Ebola)			
• Herpes			

• cervical cancer

Measles explained:

https://www.youtube.com/watch?v=y0opgc1WoS4

Measles

Caused by:
A virus (carried inside mucus or saliva droplets and remain alive for several hours)

Spread:
- when someone swallows or inhales the cough or sneeze droplets from an infected person
- touches a contaminated surfaces or objects and then touches their own mouth or nose or eats before washing their hands

Symptoms:
occur about 10 to 12 days after infection

- fever
- general discomfort, illness or lack of wellbeing (malaise)
- runny nose
- dry cough
- sore and red eyes (conjunctivitis)
- red and bluish spots inside the mouth (Koplik's spots)
- red and blotchy skin rash that appears first on the face and hairline, and then spreads to the body.

Treatment:

- bed rest
- plenty of fluids
- paracetamol to reduce pain and fever
- isolation to reduce the risk of transmission

Complications:

- inflammation of the middle ear
- diarrhoea and vomiting
- respiratory infections
- Pneumonia
- pregnancy problems
- encephalitis – or brain inflammation