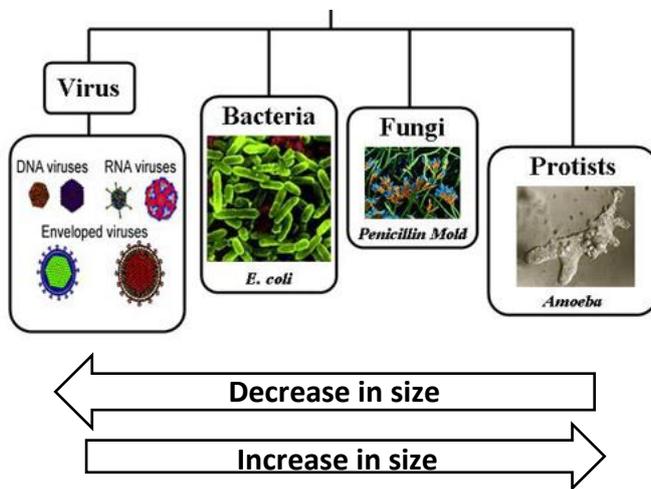


Microorganisms and Disease Summary Notes



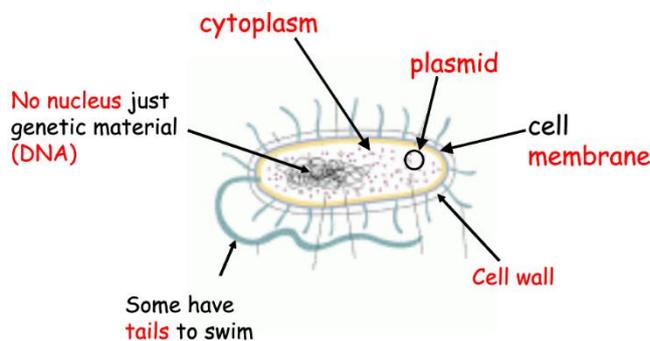
Microorganisms are organisms that are so small they **can only be seen** using a microscope.

There are **4 different types** – **fungi, bacteria, protists** and **viruses** and they all differ in size.



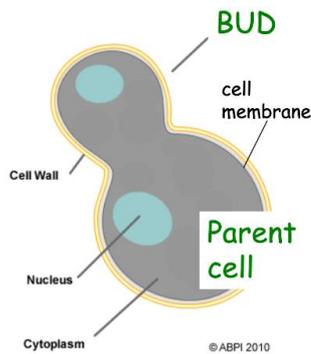
Microorganisms are **found everywhere** including on surfaces, on and in our body, in food and drink, in soil and in the air around us.

Structure of a Bacterial Cell



Bacteria **reproduce** very **quickly**. Some are harmful, while others can be **used to make** products such as **cheese** and **yoghurt**.

Structure of a Yeast Cell



Yeast are an unusual group of fungi composed of **single cells**. They **reproduce by budding** and can be used to **make** products such as **bread** and **alcohol**.

Microorganisms and Disease

Bacteria, fungi & viruses are all capable of attacking the body and **causing disease**.

Disease causing microorganisms are called **pathogens**.

Common Disease	Caused by
Tonsillitis	Bacteria or virus
Impetigo	Bacteria
Athletes foot	Fungi
Thrush	Fungi
Chickenpox	virus
Common cold	virus

Infectious **diseases** can be **spread** from person to person through;

- Coughs & sneezes
- Direct contact with someone
- Contaminated blood or other body secretions
- Contaminated food or water
- Insects such as mosquitos

Antibiotics are chemicals that can be used to **treat bacterial infections** as they **prevent** the **growth of bacteria**.

The immune system

The **human body** creates the **ideal conditions** for the growth of **pathogens** because it is warm, moist and rich in food.

The **immune system** protects the body **against disease**.

First line of defence

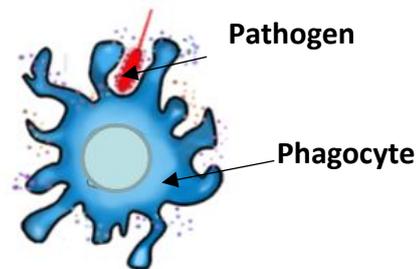
- The bodies' **barriers to infection** provide a **first line of defence** against pathogens.

Example of 1 st line defence	Chemical/Physical barrier	Function of defence
Skin	Physical	Protective barrier to prevent entry of pathogens
Mucus & cilia	Physical	Mucus traps pathogens. Cilia sweep mucus and trapped pathogens out of the respiratory system
Earwax	Physical	Sticky substance that traps pathogens
Vomiting & diarrhoea	Physical	To expel pathogens from the digestive system
Coughs & sneezes	Physical	To expel pathogens from the respiratory system
Stomach acid	Chemical	Low pH to kill pathogens
Tears	Chemical	Contain a chemical to prevent the growth of bacteria

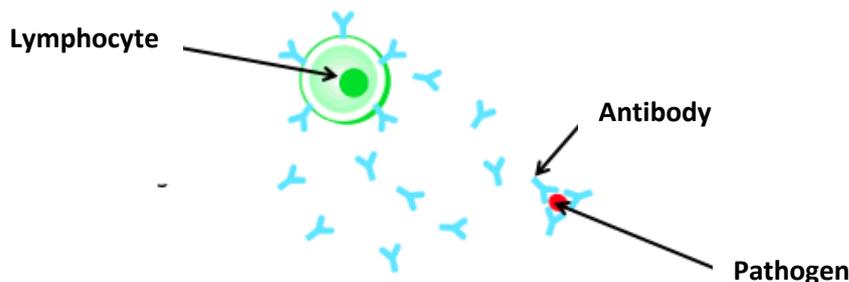
Second line of defence

- When the bodies' **first line of defence** is **overcome** an immune response is brought about by **white blood** cells to **prevent replication** and **spread of disease**.

White blood cells called **phagocytes** eat pathogens.



White blood cells called **lymphocytes** produce antibodies to **destroy pathogens**.



Vaccines

A **vaccine** is a **medicine** that is injected into the body to **provide** you with **immunity** (protection) **to a disease**.

They **contain dead** or **weak forms** of a **pathogen**.

Vaccination causes **white blood cells** (lymphocytes) to **produce antibodies**, resulting in the immune system having **memory** to the disease. If the body **encounters** the **pathogen** in the **future**, **antibodies** are **produced quickly** which **destroy** the **pathogen**. This means you **will not develop** the **disease**.

Vaccination **protects** both **individuals** and **populations** from disease through **herd immunity**.

Herd immunity is achieved **when enough of the population** are **vaccinated** to **prevent** the **spread** of a **disease**.

