Knowledge Organiser: Biology, CB5

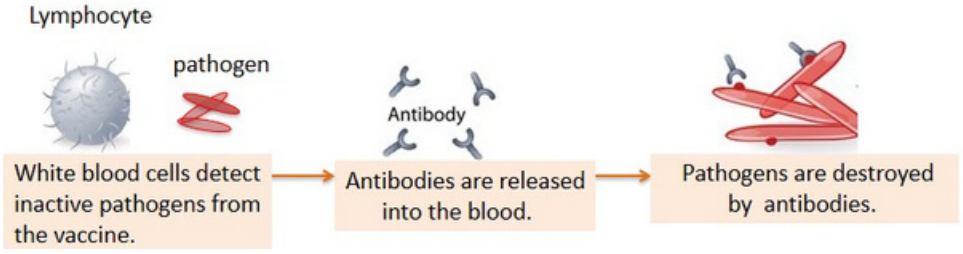
1	Health is a state of complete physical, social and mental wellbeing
2	A pathogen is a micro-organism that causes disease e.g. bacteria, virus, fungus, protist
3	A communicable disease is one that can be passed from person to person
4	A non-communicable disease is one that cannot be passed from person to person but is inherited or due to lifestyle.
5	Disease is an illness that prevents the body functioning normally.
6	Malnutrition is a health problem caused by too little or too much of a nutrient
7	A deficiency disease is caused by too little of a nutrient
8	A drug is a substance that alters the functioning of part of the body
9	BMI-body mass index, an estimate of how healthy a person's weight is for their height
10	A vector is something that transfers things from one place to another
11	STIs are sexually transmitted infections e.g. chlamydia and HIV
12	An antigen is the proteins on the surface of a cell
13	An antibody is a protein synthesised by lymphocytes, specific to an antigen on a micro-organism that will recognise it and help destroy it.

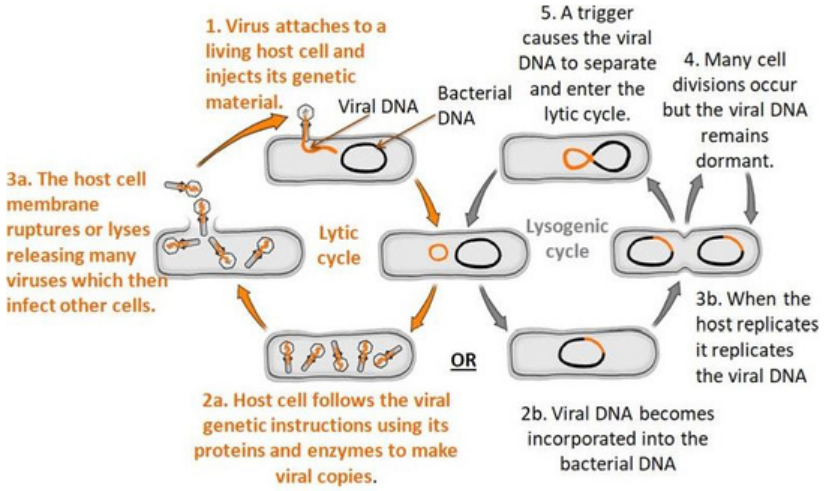
Nutrient	Disease caused by deficiency of nutrient	Symptoms of disease	Good sources in diet
protein	kwashiorkor	enlarged belly, small muscles, failure to grow properly	meat, fish, dairy, eggs, pulses (e.g. lentils)
vitamin C	scurvy	swelling and bleeding gums, muscle and joint pain, tiredness	citrus fruits (e.g. oranges) and some vegetables (e.g. broccoli)
vitamin D and/or calcium	rickets or osteomalacia	soft bones, curved leg bones	vitamin D: oily fish calcium: dairy products
iron	anaemia	red blood cells that are smaller than normal and in reduced number, tiredness	red meat, dark green leafy vegetables, egg yolk

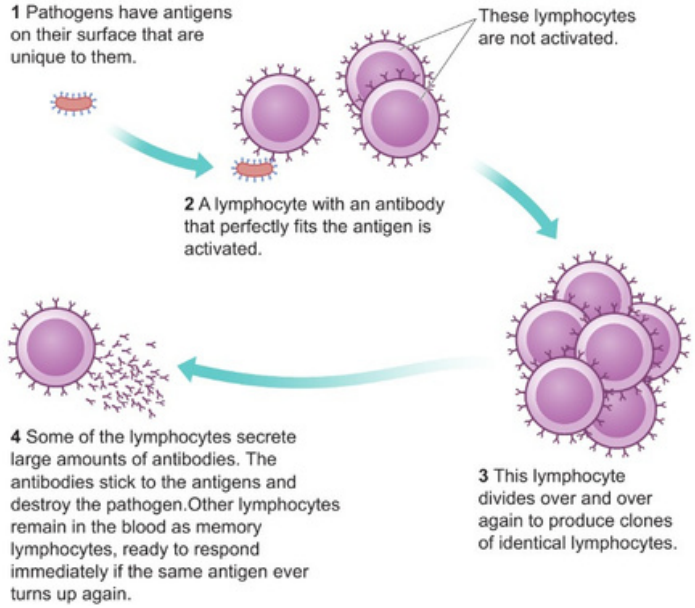
Disease	Symptom	Method of transmission	Control spread of disease by:	Caused by:
Malaria	Recurrent fever	Animal vector	Preventing breeding of mosquitoes or use of a net to prevent being bitten.	Protist
Chalara ash dieback	Leaf loss and bark lesions	Airborne	Remove infected leaf litter. Clean all tools, vehicles and footwear.	Fungus
Cholera	Diarrhoea	Waterborne	Clean drinking water and good hygiene and sanitation.	Bacteria
Tuberculosis	Lung damage	Airborne	Vaccination programme. Treat infection with antibiotics.	Bacteria
HIV	Flu like illness	Sexual contact or bodily fluids. Direct contact.	Use of condoms / clean needles. Treat infection with antiretroviral drugs.	Virus
Ebola *(biology only)*	Haemorrhagic fever	Bodily fluid - direct contact	Avoid contact with people infected with Ebola.	Virus

Knowledge Organiser: Biology, CB5

14	Lymphocytes are a type of white blood cell that produce antibodies
15	Immune is where a person does not fall ill after an infection because their immune system attacks and destroys the pathogen quickly
16	A secondary response is the way in which the immune system responds the second time the body is infected with a pathogen
17	Antibiotics are drugs that will kill bacteria
18	The body's physical defences against pathogens are skin, mucus, scabs, and ciliated cells
19	The body's chemical defences against pathogens are hydrochloric acid and lysozyme
20	Plants have ways of defending themselves from pathogens and herbivores: Physical- Bark Mechanical-Thorns







Knowledge Organiser: Biology, CB5

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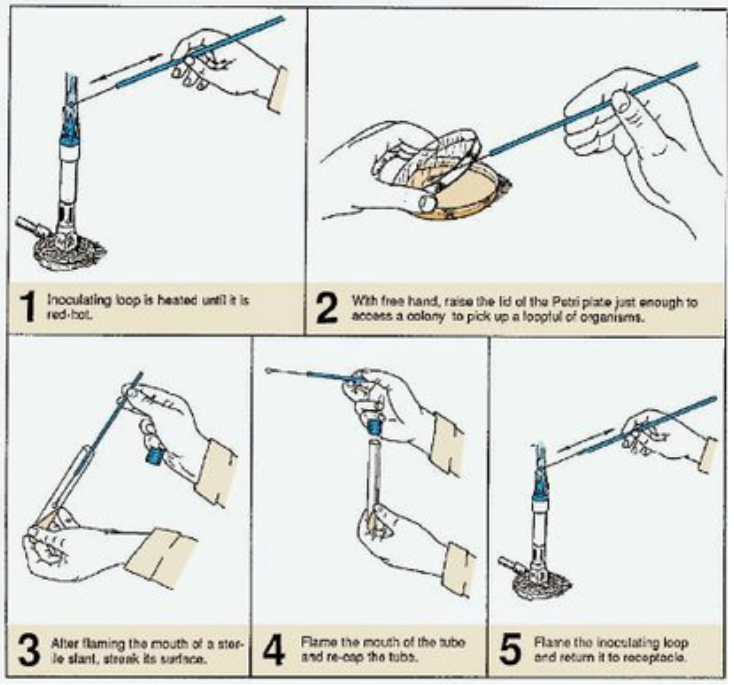
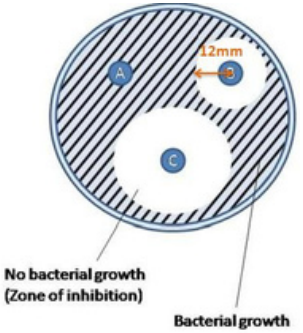
27	Plants can suffer from infections, this can be seen as unusual growth or spots/discoloured leaves
28	Bacteria can be grown in the lab using aseptic (sterile) techniques





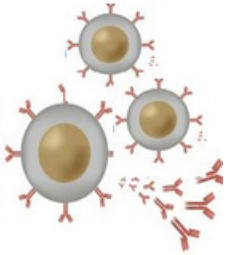
- **Stage 1** – Healthy volunteers try small doses of the drug to check it is **safe** and has **no side effects**
- **Stage 2** – A small number of **patients** try the drug at a **low dose** to see if it works
- **Stage 3** – A larger number of patients take the new drug and different doses are trialled to find the **optimum dose**
- **Stage 4** – **A double blind trial** will occur to see how effective the new drug is. The patients are divided into groups

Monoclonal antibodies are identical copies of **one** type of **antibody** produced in a laboratory.

How to produce monoclonal antibodies:

1. A mouse is **injected** with a pathogen.
2. White blood cells called **lymphocytes** produce **antibodies** but they do not divide.
3. Lymphocytes are removed from the mouse and **fused** with rapidly dividing mouse **tumour cells.**
4. The new cells are called **hybridomas**.
5. The **hybridomas divide** rapidly and release lots of **antibodies** which are then collected.

Mono = one



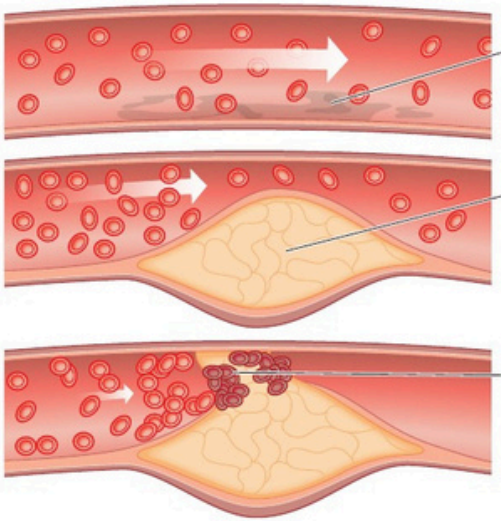
Knowledge Organiser: Biology, CB5

HAZARD → **RISK FACTOR** → **HARM**

The potential source of harm eg smoking, lack of exercise

The combination of the chances of the hazard causing harm and the severity of that harm

The damage to health or a disease that can occur



Substances from tobacco smoke damage the artery lining.

Fat builds up in the artery wall at the site of damage, making the artery narrower.

A blood clot may block the artery here, or break off and block an artery in another part of the body – causing a heart attack or **stroke**.

C Damage to blood vessels by substances from tobacco smoke can cause the build-up of fat in an artery.

$$\text{BMI} = \frac{\text{mass (kg)}}{(\text{height (m)})^2}$$