

<b>Specific immune system</b>	<b>a. Exposure to pathogen</b>	Pathogens are identified by white blood cells by the different proteins on their surfaces <b>ANTIGENS</b> .
	<b>b. Antigens trigger an immune response</b>	Trigger causes the production of antibodies.
	<b>c. Production of memory lymphocytes</b>	Antigens also trigger the production of memory lymphocytes (a type of white blood cell). These cells can produce the specific antibody for a pathogen.
	<b>d. Secondary response</b>	Memory lymphocytes can produce specific antibodies much more quickly if the same pathogen returns.

### Non-specific immune systems

<b>Immune system</b>	<b>The human body has several chemical and physical ways of providing protection from pathogens</b>		<b>Nose</b>	Nasal hairs, sticky mucus and cilia prevent pathogens entering through the nostrils.
			<b>Trachea and bronchus (respiratory system)</b>	Lined with mucus to trap dust and pathogens. Cilia move the mucus upwards to be swallowed.
			<b>Stomach acid</b>	Stomach acid (pH1) kills most ingested pathogens.
			<b>Skin</b>	Hard to penetrate waterproof barrier. Glands secrete oil which kill microbes.
			<b>Lysozymes in tears</b>	Breaks down the cell wall of some bacteria.

### Life cycle of a virus

<b>Lysogenic pathway</b>	<b>Lytic pathway</b>
Virus attaches to cell and inserts genetic material	Viral genetic material can spilt off from bacterial chromosome.
Viral genetic material forms a circle.	
The viral genetic material uses to cell to produce new proteins and genetic material to make new viruses	Viral genetic material is inserted into the bacterial chromosome.
Cell breaks apart (lyse) to release new viruses.	Bacterium reproduces normally replicating both types of genetic material.

### EDEXCEL GCSE HEALTH DISEASE AND MEDICINE part 2

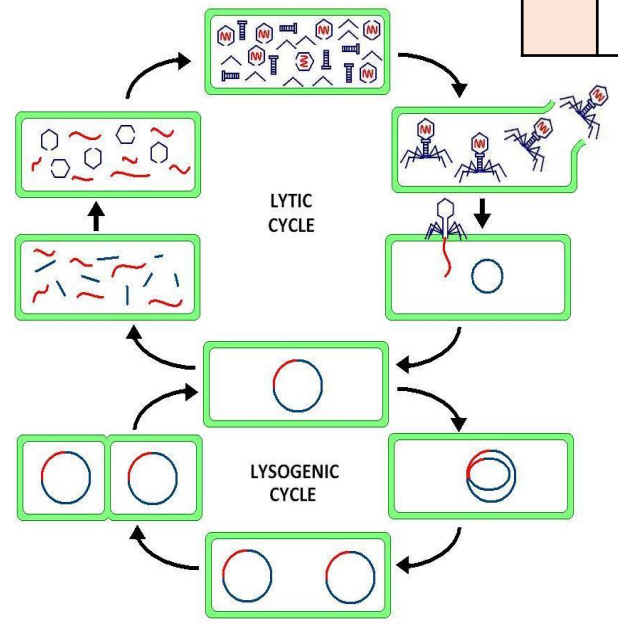
<b>Antibiotics</b>	<b>e.g. penicillin</b>	Used to treat bacterial infection by inhibiting cells processes in the bacterium but not the host organism (human) cells. They do not work on viruses.
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### Immunisation

**Vaccines are used to immunise a large proportion of the population (herd immunity) to prevent the spread of a pathogen**

<b>Vaccination</b>	<b>Small amount of dead or inactive form of the pathogen</b>	<b>1<sup>st</sup> infection by pathogen</b>	White blood cells detect pathogens in the vaccine. Antibodies are released into the blood.
		<b>Re-infection by the same pathogen</b>	White blood cells detect pathogens. Antibodies are made much faster and in larger amounts.

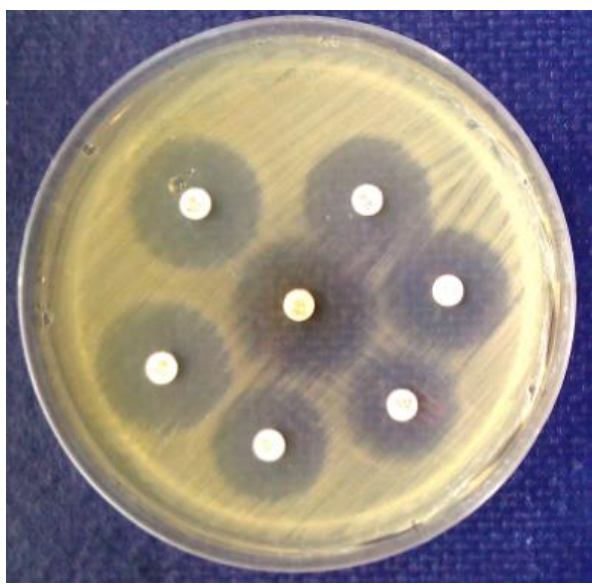
<b>Vaccination (Biology only)</b>	<b>Disadvantages</b>	A very small number of people (eg 1 in 900000 for MMR) a person may have a bad reaction to a vaccine and therefore cannot be immunised.
	<b>Advantages</b>	Almost everyone can be immunised (herd immunity) which protects those people who cannot have vaccines. Spread of a pathogen in a population is prevented.



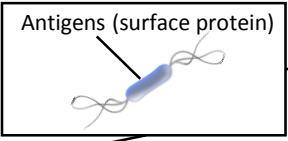
**Calculate cross sectional area**

$$\pi r^2$$

Measure the diameter of the clear area where bacteria has not grown. Half the diameter of the clear area to find the radius.



<b>Aseptic technique</b>	<b>Aseptic technique</b>		
	<b>Autoclave</b>	<b>Sterile inoculating loops</b>	<b>Covered petri dishes and culture vials</b>
	Sterile growth medium and agar plates are sterilized by subjecting them to high pressure steam.	Sterilized before transferring microorganisms so that sample isn't contaminated.	Covered to avoid contamination by other microorganisms in the air.



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### Non-specific immune systems

### Immune system

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### EDEXCEL GCSE HEALTH DISEASE AND MEDICINE part 2

### Immunisation

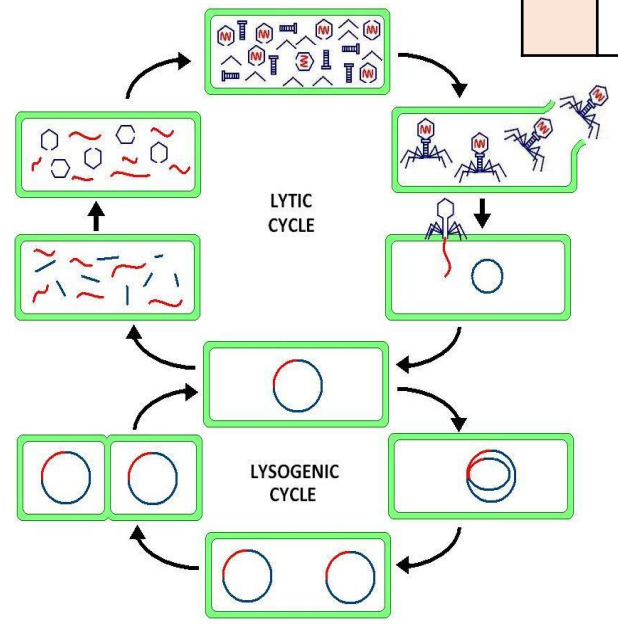
<b>e.g. penicillin</b>	Used to treat bacterial infection by inhibiting cells processes in the bacterium but not the host organism (human) cells. They do not work on viruses.
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### Vaccines are used to immunise a large proportion of the population (herd immunity) to prevent the spread of a pathogen

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**$\pi r^2$**

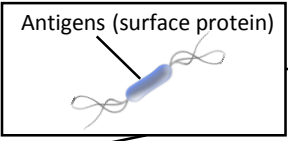
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### Aseptic technique

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### EDEXCEL GCSE HEALTH DISEASE AND MEDICINE part 2

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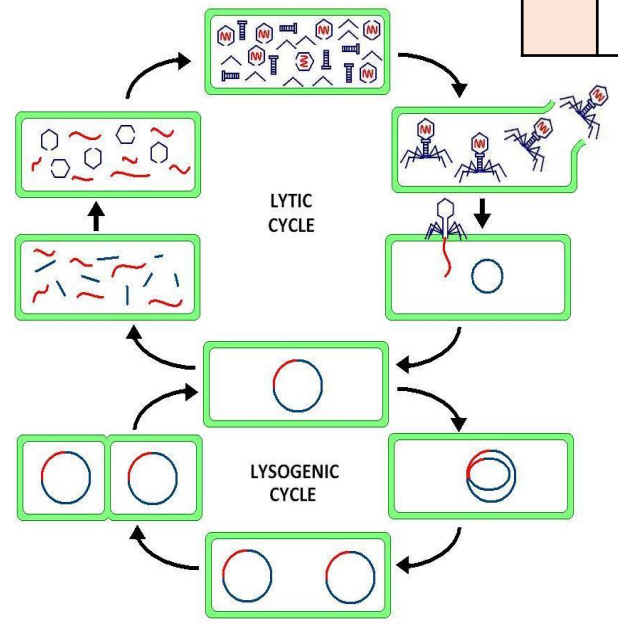
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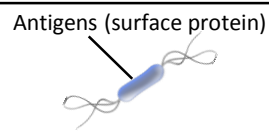


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### Aseptic technique

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**Non-specific immune systems**

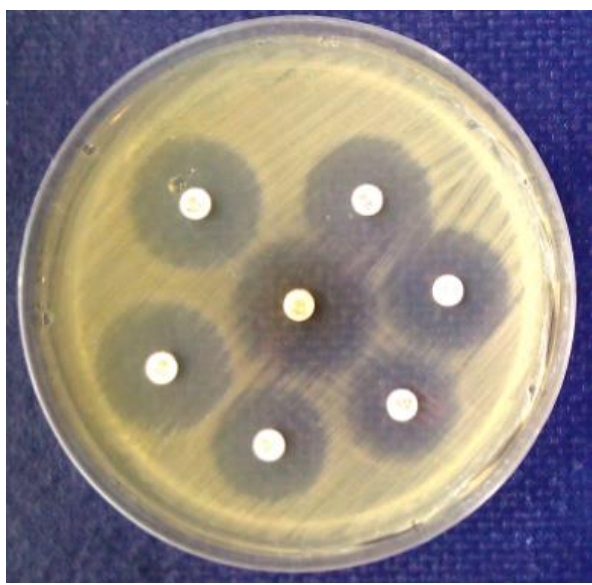
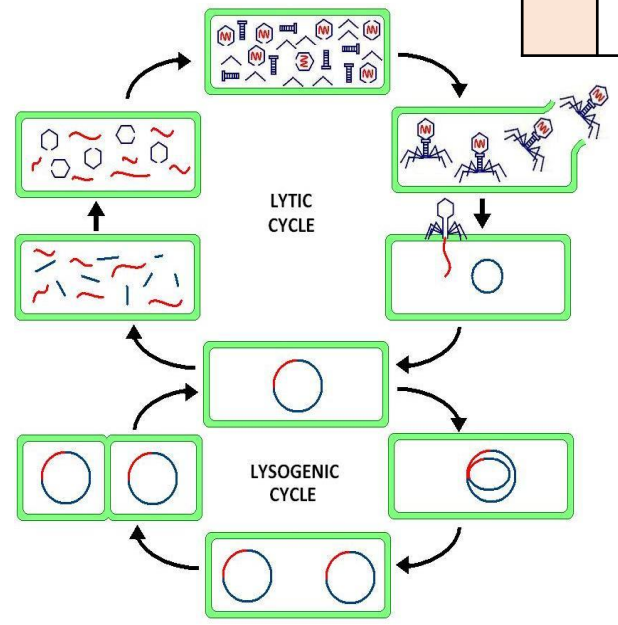
**Immune system**



**EDEXCEL GCSE HEALTH DISEASE AND MEDICINE part 2**

**Immunisation**

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**Aseptic technique**