

# All you need to know about ...

## Module B2

OCR 21st Century Science

### MICROORGANISMS



	BACTERIUM	FUNGI	VIRUS
<b>Size</b>	1-5 mm	50+ mm	20-300 nm
<b>eg</b>	tonillitis	athlete's foot	'flu, polio common cold

### ANTIBIOTICS

- kill bacteria
- kill fungi

- don't kill viruses
- bacteria and fungi can become resistant to antibiotics
- only use antibiotics when necessary
- always finish the course to build up resistance



### A white blood cell ingesting a microbe

### RESISTING INFECTION

The body has barriers to prevent microorganisms entering

- skin
- mucous
- tears
- acid
- white blood cells

### BACTERIA

- reproduce by cells splitting into two new cells
- they prefer - warmth, moisture and nutrients
- numbers can double every 20 minutes

### Heart attacks

- caused by fatty deposits in blood vessels
- caused by lifestyle and/or genetic factors
- not caused by microorganisms
- lifestyle factors
  - poor diet
  - smoking
  - stress
  - excess alcohol intake
- heart disease is very common in the UK
- heart disease is less common in non-industrialised countries
- regular exercise reduces the risk of heart attacks

### Things we can't change:

- Age – older people are more likely to develop heart disease.
- Gender – men are more likely to develop heart disease than women
- Genes – you are at greater risk if your parents have heart disease

### TESTING DRUGS

Any new drug is checked in many ways before it is tested on people.

#### STAGE 2 – Animal tests

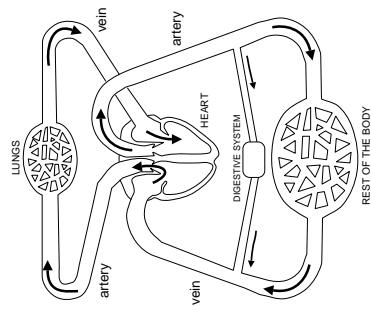
- If early tests have shown that the drug could work .
- If it passes tests on human cells it is tested on animals.
- Scientists apply for a licence to test a drug on animals.
- Other scientists check the results of their work.

#### STAGE 3 – Human trials

- Tests on people are called human trials or clinical trials. It takes many years before scientists get to this stage.
- If the drug passes animal tests, the scientists write a plan for human trials.
- Scientists must apply for a licence to do the tests.
- Firstly, the drug is tested on healthy people - his gives data about how safe it is to take.

### HEART DISEASE

- provide protection from microorganisms
- establish antibodies **before** any infection
- has a safe form of the disease-carrying organism
- are never completely safe
- can have side effects
- you have to weigh up the risks of possible side-effects
- vaccinating a small number of people is useless
- high percentage of the population must be vaccinated
- a flu virus changes quickly
- new flu vaccines have to be developed regularly
  - finding a vaccine against the HIV virus is difficult
  - the virus damages the immune system
  - there is a high mutation rate



- heart muscle cells need their own blood supply
- arteries carry blood away from heart - greater pressure - thick
- veins bring blood to the heart - less pressure - thinner
- when sitting down your heart beats about 70 times a minute

### Things we can change:

- Smoking – more than doubles the risk of heart disease.
- High blood pressure – increases the risk of heart disease.
- High blood cholesterol – a high-fat diet, particularly animal fats from meat and dairy products, raises the blood cholesterol level, which increases the risk of heart attacks.
- Being overweight – can make your blood pressure go up and raise your cholesterol levels. Both increase your risk of a heart attack.
- Diet – healthy, balanced, low-fat diets reduce risk of a heart attack.
- Exercise – strengthens the heart and helps to keep weight down. It also decreases blood pressure, and improves the cholesterol balance.
- Stress – can cause people to eat more, exercise less, and smoke more. So stress increases the risk of a heart attack.