WJEC Wales Biology GCSE

2.8 - Disease, Defence and Treatment

Flashcards

What is a pathogen?

What is a pathogen?

A microorganism that causes disease

What is a non-pathogenic microorganism?

What is a non-pathogenic microorganism?

Any microorganism that does not cause disease

Give an example of a non-pathogenic microorganism

Give an example of a non-pathogenic microorganism

- Gut bacteria help to digest food
- Skin flora help to prevent infection by competing with pathogens for resources

Give 4 types of pathogen

Give 4 types of pathogen

Bacteria

Viruses

Protists

Fungi

Give 5 features of bacteria cells

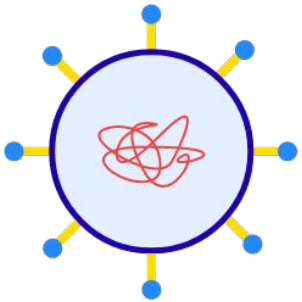
Give 5 features of bacteria cells

- Cell membrane
- Cell wall
- Cytoplasm
- Plasmid loops of DNA
- No nucleus but large DNA loop instead

Describe the structure of a virus

Describe the structure of a virus

They contain some genetic material surrounded by a protein shell



Give 6 ways diseases can be spread

Give 6 ways diseases can be spread

- Droplet infection
- Eating contaminated food
- Drinking contaminated water
- Direct contact
- Vectors like insects
- Contact with infected bodily fluids

What is the name of the pathogen that causes AIDS?

What is the name of the pathogen that causes AIDS?

Human immunodeficiency virus (HIV)

What are the symptoms of AIDS?

What are the symptoms of AIDS?

HIV weakens the immune system

- Fever
- Flu-like symptoms
- Rash

How can the spread of HIV be prevented?

How can the spread of HIV be prevented?

HIV is spread through bodily fluids

- Don’t share needles
- Wear condoms during sex

What is the name of the pathogen that causes chlamydia?

What is the name of the pathogen that causes chlamydia?

Chlamydia trachomatis bacteria

What are the symptoms of chlamydia?

What are the symptoms of chlamydia?

- Pain when urinating
- Painful discharge from the penis or vagina
- Bleeding between periods for women

How can the spread of chlamydia be prevented?

How can the spread of chlamydia be prevented?

Wear condoms during sex

What is the name of the pathogen that causes malaria?

What is the name of the pathogen that causes malaria?

Plasmodium falciparum

What are the symptoms of malaria?

What are the symptoms of malaria?

- Fever
- Vomiting and diarrhoea
- Headaches
- Muscle and/or abdominal pain

How can the spread of malaria be prevented?

How can the spread of malaria be prevented?

- Wearing long clothing
- Wearing mosquito repellent
- Sleeping with mosquito nets
- Use malaria prevention tablets

Give 5 non-specific human defences to disease

Give 5 non-specific human defences to disease

- The skin acts as a barrier
- Stomach acid kills ingested pathogens
- Mucus traps pathogens
- Sweat contains antimicrobial chemicals
- Blood clots prevent pathogen entry into wounds

Give 2 ways that lymphocytes can respond to detecting a pathogen

Give 2 ways that the body can respond to detecting a pathogen

- They can produce antibodies that are specific to the antigens on the pathogen that activate phagocytes
- They can produce antitoxins to neutralise the toxins released by the pathogen

How do phagocytes respond to detecting a pathogen?

How do phagocytes respond to detecting a pathogen?

Phagocytes engulf and break down pathogens in a process known as phagocytosis

What are antigens?

What are antigens?

Molecules on the surface of cells that are recognised by the immune system and trigger an immune response

What do antibodies do?

What do antibodies do?

Antibodies are specific molecules that bind to antigens and help the immune system to neutralise the infection

Give 2 types of pathogen that vaccines can protect against

Give 2 types of pathogen that vaccines can protect against

- Bacteria
- Viruses

Why might parents choose to have their child vaccinated?

Why might parents choose to have their child vaccinated?

- Vaccines save lives and will prevent their child from getting certain diseases

- Parents in countries without free healthcare may not be able to afford treatment if their child falls ill from a disease

Why might parents choose **not** to have their child vaccinated?

Why might parents choose **not** to have their child vaccinated?

- They may be concerned about the potential side effects of vaccination
- They may be unaware of the contents of the vaccine
- They may have religious or cultural objections to it
- They may believe that vaccines are linked to certain other diseases like autism, asthma and multiple sclerosis

What negative impacts could arise from the decision to not vaccinate children?

What negative impacts could arise from the decision to not vaccinate children?

Not vaccinating children can lead to breakouts of diseases which may cause epidemics or pandemics and put a strain on the healthcare system

How do vaccines work? (Higher)

How do vaccines work? (Higher)

- Dead or inactive pathogens or antigens for a disease are injected into the body
- Lymphocytes produce antibodies against the pathogen
- Memory cells are also created to provide long term immunity

Why is the secondary response to a pathogen much faster than the initial response? (higher)

Why is the secondary response to a pathogen much faster than the initial response? (higher)

The activation of the immune system in response to a new pathogen is relatively slow. Memory cells that remain in the blood speed up the process and can produce many antibodies much quicker

What type of pathogen do antibiotics kill?

What type of pathogen do antibiotics kill?

Antibiotics kill bacteria

What was the first ever antibiotic discovered?

What was the first ever antibiotic discovered?

Penicillin was discovered by Alexander Fleming in 1928

Outline how antibiotics work

Outline how antibiotics work

Antibiotics stop bacteria from growing or kill them completely without damaging the host cells which can cure bacterial diseases

What type of microorganism produces penicillin?

What type of microorganism produces penicillin?

A fungus called *penicillium*

What is semisynthetic penicillin?

What is semisynthetic penicillin?

Penicillin that has been modified chemically

What is synthetic penicillin?

What is synthetic penicillin?

Penicillin that has been produced from scratch chemically rather than being produced naturally by microorganisms

Give one example of an antibiotic resistant bacterium

Give one example of an antibiotic resistant bacterium

MRSA (Methicillin-resistant Staphylococcus aureus)

State 3 ways of controlling the spread of MRSA

State 3 ways of controlling the spread of MRSA

- Cover wounds with sterile dressings
- Wash your hands, surfaces and equipment often and thoroughly
- Treatment and screening programmes

Give 3 ways diseases can be prevented

Give 3 ways diseases can be prevented

Washing hands

Having a balanced and healthy diet

Drinking clean water

What are the stages in the development of new medicines?

What are the stages in the development of new medicines?

- Research the drug and test it on lab grown cells
- Test on animals
- Test on healthy volunteers
- Test on people who have the disease

What are preclinical trials?

What are preclinical trials?

Testing the drug on lab grown cells and tissues and using computer modelling to understand the effects of the drug

What is a placebo?

What is a placebo?

A substance which looks the same and is ideally indistinguishable from the actual drug but has no effect when taken

What are placebos used for?

What are placebos used for?

Placebos are used to test the effectiveness of a new drug by providing a comparison point

What is a blind trial?

What is a blind trial?

Where the patients do not know which drug is the placebo and which is the actual drug

What is a double blind trial?

What is a double blind trial?

Where both the patients and the researchers do not know which drug is the placebo and which is the actual drug to avoid any bias in the results

How do lymphocytes produce monoclonal antibodies? (Higher)

How do lymphocytes produce monoclonal antibodies? (Higher)

- Lymphocytes are activated and produce antibodies that are specific to a pathogen
- The lymphocytes divide so that lots of antibodies can be made at once

How are monoclonal antibodies produced in a lab? (Higher)

How are monoclonal antibodies produced in a lab? (Higher)

- Antigens are injected into a mouse
- The mouse produces lymphocytes
- The lymphocytes are removed and fused with a myeloma to create a hybridoma
- The hybridoma grows rapidly and produces the antibodies

How can monoclonal antibodies be used to detect diseases like chlamydia, HIV and malaria? (Higher)

How can monoclonal antibodies be used to detect diseases like chlamydia, HIV and malaria? (Higher)

Specific monoclonal antibodies that are attached to fluorescent dyes are mixed with bodily fluids so that they will fluoresce if the pathogen is present

How are monoclonal antibodies used in tissue and organ transplants? (Higher)

How are monoclonal antibodies used in tissue and organ transplants? (Higher)

They are used to deactivate T cells so that there is no immune response

How are monoclonal antibodies used to help chemotherapy? (Higher)

How are monoclonal antibodies used to help chemotherapy? (Higher)

They are used to deactivate T cells so that there is no immune response