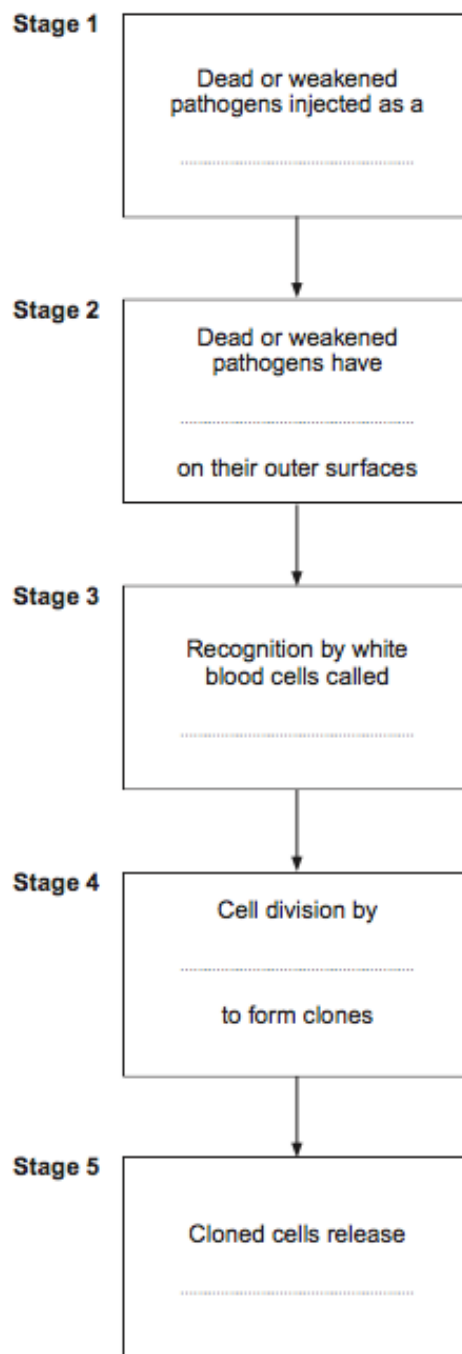


GCSE Double Award Biology Higher Tier
Unit 4/Biology 2: Topic 4.6

Disease, defence and treatment

1. The incomplete flow chart below shows the stages that occur after a person has been given an injection for protection against a disease caused by a pathogen. Complete the flow chart by adding the most appropriate words. [5]



/5

2. The World Health Organisation (WHO) collects data on the disease, tuberculosis (TB) which is caused by a bacterium. The WHO used the data shown in the table below to estimate:

- the total number of people with the disease in each region;
- the number of deaths from TB in each region.

Region	Number of people with TB per 100 000	Number of deaths from TB per 100 000
Africa	345	78
USA	43	6
Eastern Mediterranean	122	28
Europe	50	8
South East Asia	190	38
Western Pacific	112	19

(a) (i) Give **one** reason why it is necessary to express the number of people as per 100 000. [1]

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(ii) Calculate the percentage of those with TB in Europe who survive the disease. Show your working. [2]

percentage who survive %

(iii) How does the data show that Africa is less successful at treating TB than Europe? [1]

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(b) A vaccine against TB has existed since 1921. Explain how a vaccine can protect the body from a disease caused by a bacterium. [4]

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(c) The number of cases of TB decreased considerably in many countries during the 20th century. Over the past 15 years, the number of cases worldwide has greatly increased. Suggest why this has happened. [1]

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3. Sheep and cattle can be infected with a disease caused by the bluetongue virus.
- The bluetongue virus is carried by biting insects called midges.
 - Midges can be killed by insecticides.
 - Researchers at Swansea University have discovered a fungus (*Metarhizium anisopliae*) that can kill midges under laboratory conditions.
 - In 2011 field trials began to investigate if midges can be controlled by the fungus.

(a) (i) Describe the basic structure of a virus. [2]

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(ii) Underline the most accurate statement below concerning the reproduction of viruses: [1]

Viruses only reproduce in

- I dead cells
- II animal cells
- III living cells
- IV plant cells

(b) Suggest **one** disadvantage of the use of insecticides in killing midges. [1]

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(c) What term is used to describe the use of a fungus to kill midges? [1]

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(d) Suggest **two** possible problems which could prevent the fungus being used successfully in killing the midges in the field trials. [2]

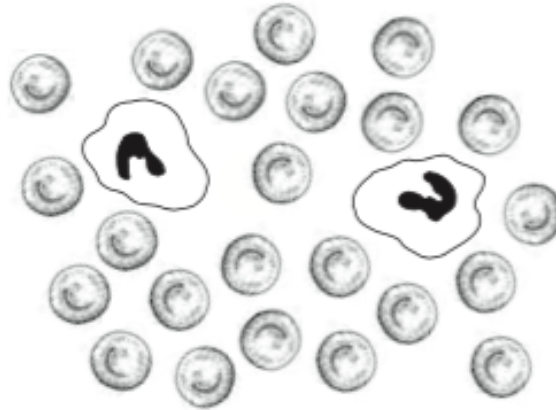
I.

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II.

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4. The diagram shows a blood smear as seen through a light microscope.



- (a) Complete the table below about the different parts of the blood.

[4]

name of part	function
red cell	
	produce antibodies
phagocyte	
platelets	

- (b) Explain why the centre of a red blood cell appears paler than the surrounding cytoplasm when seen through a light microscope. [2]

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/6