

Monoclonal antibodies: practice questions

5 questions • 13 marks • mark scheme at the back

For AQA GCSE Biology 8461 and Combined Science: Trilogy 8464. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 13

1 **Triple only** **Higher tier** [1 mark]

How are monoclonal antibodies produced?

- A. ☐ From a single clone of cells
- B. ☐ From a mixture of different lymphocytes
- C. ☐ From the blood of a patient only
- D. ☐ From bacteria that have been killed

2 **Triple only** **Higher tier** [4 marks]

Describe how monoclonal antibodies are produced.

3 **Triple only** **Higher tier** [4 marks]

Monoclonal antibodies can be used to treat cancer. Explain how a monoclonal antibody can deliver a drug to cancer cells without harming other cells in the body.

4

Triple only

Higher tier

[2 marks]

Give two uses of monoclonal antibodies other than treating disease.

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5

Triple only

Higher tier

[2 marks]

Give one advantage and one disadvantage of using monoclonal antibodies to treat disease.

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1] Triple only Higher tier

A A (1)

2. [4] Triple only Higher tier

- mouse lymphocytes are stimulated to make a particular antibody (1)
- lymphocytes combined with a tumour cell (1) to make a hybridoma cell (1)
- hybridoma cell can both divide and make the antibody (1)
- single hybridoma cells are cloned (1) to produce many identical cells making the same antibody
- the antibody is collected and purified (1)
- Max 4

3. [4] Triple only Higher tier

- antibody is specific to / binds to an antigen on the cancer cells (1)
- the antibody is bound to a radioactive substance / toxic drug / chemical that stops cells growing and dividing (1)
- so the substance is delivered to the cancer cells (1)
- the antibody does not bind to other cells so they are not harmed (1)

4. [2] Triple only Higher tier

- diagnosis, e.g. pregnancy tests (1)
- in laboratories to measure levels of hormones / chemicals in blood or detect pathogens (1)
- in research to locate / identify specific molecules in a cell or tissue using a fluorescent dye (1)
- Max 2

5. [2] Triple only Higher tier

- advantage: target specific cells / chemicals so other cells are not harmed (1)
- disadvantage: create more side effects than expected / not yet as widely used as hoped (1)