

# Monoclonal Antibodies

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

## 1. Worked example

**Give four uses of monoclonal antibodies. (4 marks)**

Step 1 · Diagnosis

Pregnancy tests (detecting hCG).

Step 2 · Laboratory

Measuring levels of hormones and other chemicals in blood, or detecting pathogens.

Step 3 · Research

Locating or identifying specific molecules in cells or tissues by binding them to a fluorescent dye.

Step 4 · Treatment

Treating some diseases, e.g. cancer: the antibody can carry a radioactive substance, a toxic drug or a chemical that stops cells dividing.

**Answer: Pregnancy tests; lab measurement; research; treatment**

Check: All rely on the antibody binding to only ONE specific antigen.

## 2. Now try one with the steps

**Explain why a lymphocyte is fused with a tumour cell to make monoclonal antibodies. (2 marks)**

Step 1 · Lymphocyte

Step 2 · Tumour cell

**Answer:**

## 3. Practice

Show your working. The marks tell you how much is expected.

**1.** What are monoclonal antibodies? [2]

**2.** Which hormone does a pregnancy test detect? [1]

**3.** Name the animal whose lymphocytes are usually used. [1]

4. What is a hybridoma cell? [1]
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5. Explain why monoclonal antibodies bind to only one type of molecule. [2]
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6. Explain why a pregnancy test has a control line. [2]
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7. Describe how monoclonal antibodies are used in research to find a molecule in a tissue. [2]
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8. Give one way a monoclonal antibody can be used to measure substances in blood. [1]
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9. A hybridoma divides every 24 hours. Starting with one cell, how many cells after 10 days? [2]
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10. Give two things that can be attached to monoclonal antibodies to treat cancer. [2]
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11. Explain one disadvantage of using monoclonal antibodies in treatment. [2]
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12. A trial found 45 of 300 patients had side effects. Calculate the percentage. [1]
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13. Explain why monoclonal antibodies are made in mice rather than taken from humans. [2]
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14. Evaluate the use of monoclonal antibodies in medicine. [4]
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#### 4. Before you hand it in

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**"Monoclonal antibodies attack all pathogens."**

Each monoclonal antibody binds to only one specific antigen.

**"The tumour cell makes the antibody."**

The lymphocyte provides the antibody; the tumour cell provides rapid division.

**"No line in the control window means not pregnant."**

If the control line does not appear, the result is invalid; repeat with a new test.