

Exercise walk-through

3.3

Monoclonal antibodies – biology only, HT (4.3.2)

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Exercises 2.1·2.3

2.1 Which two cell types are fused to make a hybridoma, and what does each contribute? [4]

2.2 Why is the hybridoma's dual ability important? [2]

2.3 Give two uses of monoclonal antibodies. [2]

Exercises 2.1·2.3

2.1 Which two cell types are fused to make a hybridoma, and what does each contribute? [4]

2.1 Mouse lymphocyte – makes the specific antibody; tumour cell – divides rapidly and endlessly.

2.2 Why is the hybridoma's dual ability important? [2]

2.2 A hybridoma both divides and produces the antibody, so large quantities of one antibody can be made.

2.3 Give two uses of monoclonal antibodies. [2]

2.3 Any two: pregnancy tests; measuring hormone levels; detecting pathogens; locating molecules in research; cancer treatment.

Exercises 3.1·3.3

3.1 Describe how monoclonal antibodies are produced.

[4]

3.2 Explain how a monoclonal antibody can treat cancer without harming other cells.[3]

3.3 A pregnancy test strip contains monoclonal antibodies to HCG in one zone. Explain how the test gives a positive result. [3]

Exercises 3.1·3.3

3.1 Describe how monoclonal antibodies are produced. [4]

3.1 Stimulate mouse lymphocytes to make the antibody; fuse them with tumour cells to make hybridoma cells; clone a single hybridoma; collect and purify the large quantity of antibody produced.

3.2 Explain how a monoclonal antibody can treat cancer without harming other cells.[3]

3.2 The antibody is specific to the antigen on the cancer cells only; it is bound to a radioactive substance, toxic drug or growth-stopper; it delivers the substance to the cancer cells without harming other body cells.

3.3 A pregnancy test strip contains monoclonal antibodies to HCG in one zone. Explain how the test gives a positive result. [3]

3.3 HCG in the urine binds to the antibodies; the complex moves along the strip and is trapped in the result zone by more antibody; the bound complex forms a coloured line – a positive result.