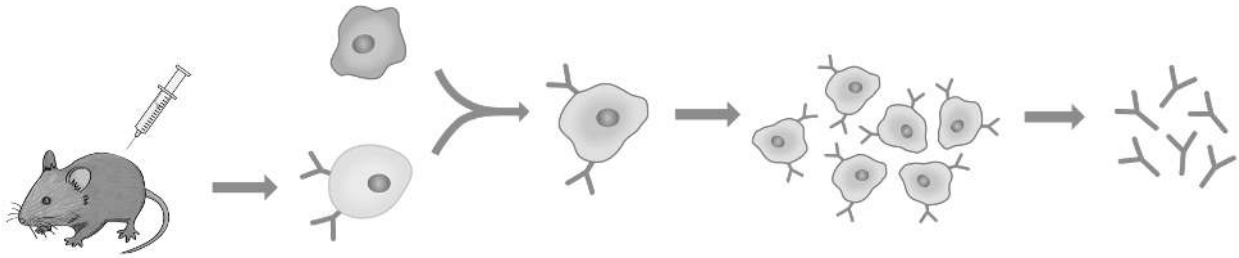


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The diagram below shows how monoclonal antibodies are produced



0 1 . 1

The first stage involves injecting a mouse with an antigen

Define what is meant by an antigen

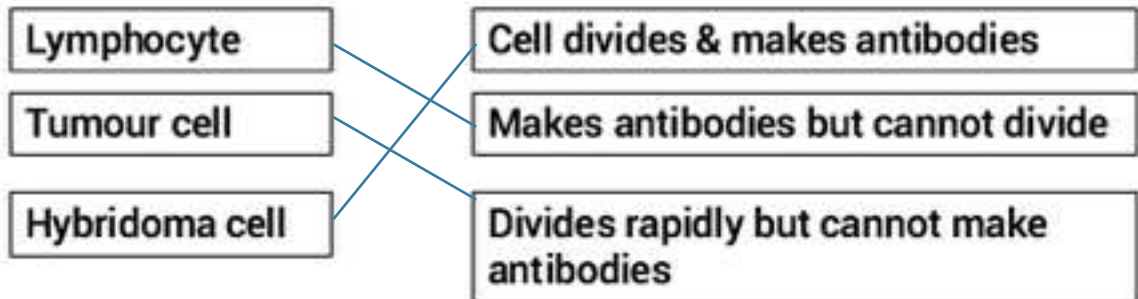
[1 mark]

Surface protein that stimulates the production of antibodies [1]

0 1 . 2

Link each cell type below with their role in making monoclonal antibodies

[3 marks]



0 1 . 3

Explain how monoclonal antibodies can be used to diagnose some diseases

[4 marks]

monoclonal antibodies bind to specific antigens [1]

that are found on cells or on pathogens [1]

the monoclonal antibodies carry a marker/fluorescent dye [1]

that enables the disease to be identified/ if it glows under UV light[1]

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4

Cetuximab (Erbix) is a monoclonal antibody used to treat lung cancer. It is shaped to fit receptors on the surface of cancer cells that growth hormones bind to. Suggest how this monoclonal antibody works to prevent the growth of cancerous cells in the lungs

[2 marks]

(Erbix) monoclonal antibody attaches to (growth hormone) receptor on cancerous cells (in the lungs) [1]
this blocks/prevents the attachment of the growth hormone [1]
so the cancerous cells can no longer grow/divide [1]

DON'T FORGET : 'Suggest' questions are high level questions where you apply your knowledge to an unfamiliar context. So don't be worried about answering a question on a treatment you are likely to have heard nothing about!

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5

Describe the advantages of using monoclonal antibodies to treat cancer compared with the following conventional treatments:

[2 marks]

Chemotherapy: chemotherapy targets all cells that divide rapidly/monoclonal antibodies are specific to just the cancerous cells [1], (using monoclonal antibodies) reduces symptoms of hair loss, nausea (experienced during chemotherapy) [1]

Radiotherapy: radiotherapy targets cancerous cells but also kills/damages healthy cells surrounding cancerous cells [1] while radiation from monoclonal antibodies targets just the cancerous cells [1]

DON'T FORGET: The information written within brackets in a mark scheme is not needed to gain a mark - it is simply put there to put the marking points into a context or to explain the reason behind a marking point.