

Monoclonal antibodies

- identical specific antibodies produced from B-lymphocytes fused with tumour cells forming a hybridoma, which divides rapidly in laboratory conditions to form a clone

The medical uses of monoclonal antibodies

- diagnosis of diseases
- tissue typing for transplants
- monitoring the spread of malaria
- supporting chemotherapy for cancers

The use of monoclonal antibodies in the diagnosis of diseases

- Immunoassays are used in the diagnosis of diseases caused by *Chlamydia trachomatis*, *HIV* and *Plasmodium*.
- Labelled (via radioactivity or fluorescence) monoclonal antibodies are added to test samples of infected body fluids and attach to specific antigens.
- The extent of the infection is related to the extent of the labelling.

The use of monoclonal antibodies in tissue typing for transplants

- The concentration of non-self-antigens in tissues is assessed.
- Monoclonal antibodies can be used against helper T-cells (T-lymphocytes) so B-lymphocytes, normally causing rejection, are prevented from functioning.

The use of monoclonal antibodies in monitoring the spread of malaria

- Blood is taken from samples of people (even if they do not show any malarial symptoms) and tested with labelled monoclonal antibodies.
- Monoclonal antibodies will detect the presence of *Plasmodium* in the bloodstream (even if they are dead or killed by anti-malarial drugs) as they have specific antigens and will attach to the labelled monoclonal antibodies.
- This enables the success of anti-malarial drugs and the potential spread of malaria to be monitored.

The use of monoclonal antibodies in supporting chemotherapy for cancers

- The destruction of cancer cells can be targeted with the use of monoclonal antibodies.
- Some types of cancer cells have specific antigens called tumour markers.
- Monoclonal antibodies that act against tumour markers can be produced.
- If these are attached to anti-cancer drugs, they will deliver the drug directly to the cancer cells.