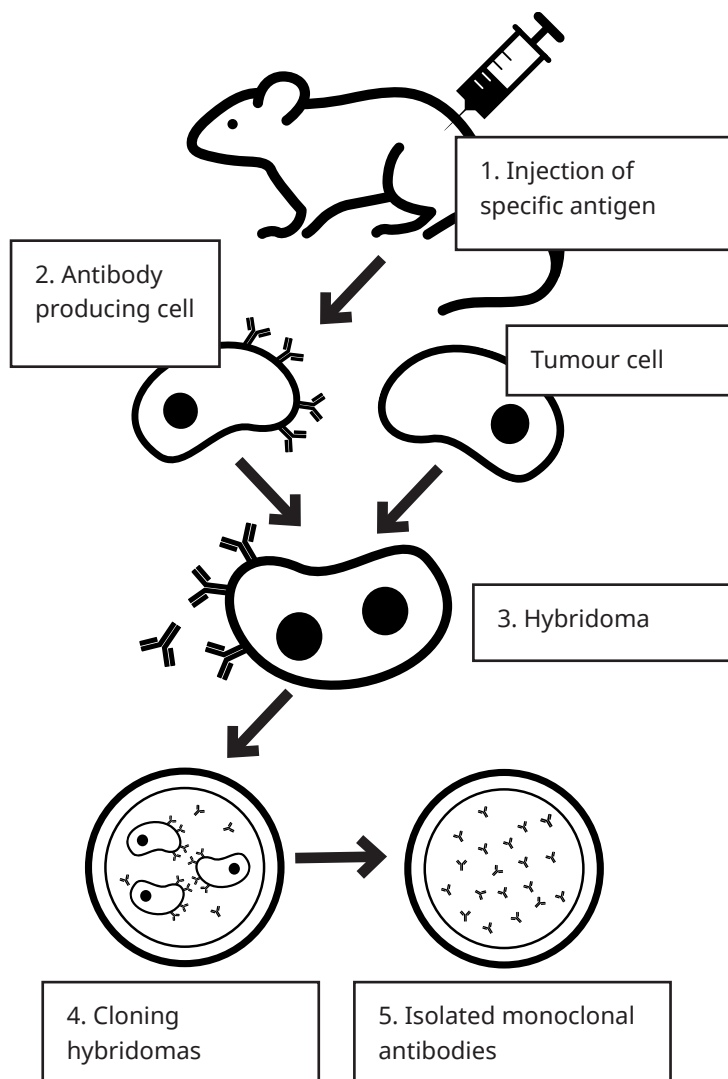




A monoclonal antibody is produced from **cloned** hybridomas which makes them _____.



1. The antigen that will stimulate the specific _____ production is injected into a mouse.
2. The mouse's immune system (B-lymphocytes) begins to produce antibodies specific to the _____.
3. One of these antibody producing _____ is fused with a _____ cell forming a hybridoma.
4. The _____ divides repeatedly producing many clones which all produce the same antibodies (monoclonal antibodies)
5. These _____ (MAb) can then be isolated can be isolated and used for many things.

Word Bank

B- Lymphocytes

Antibody

identical

Monoclonal antibodies

Hybridoma

Tumour cell

Antigen



Biology

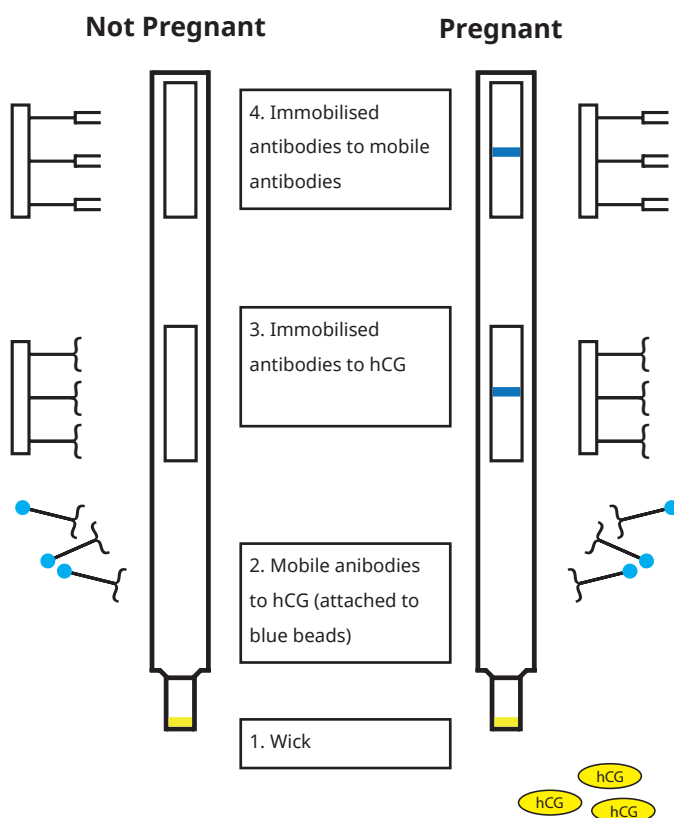
Immunoassays

The name immunoassay comes from “immune” the specific response against antigens and “assay” a test.

An immunoassay uses monoclonal antibodies to detect specific antigens. The monoclonal antibodies could be labelled so that if it binds to its specific antigen this can be detected.

Labelling could be _____ and detected later in further tests or _____ molecules which are visible under a microscope.

Pregnancy tests are simple immunoassays:



1. _____ are created which will bind to a specific antigen/hormone (HCG) only made during pregnancy.
2. Some are fixed in a line under the window on the pregnancy test others are _____ with a blue dye.
3. As the urine containing the pregnancy hormone seeps along an absorbent strip it attaches to the labelled monoclonal antibodies and they both move to the line of antibodies under the viewing window.
4. As more and more labelled hormone/antibody _____ attach to the line of monoclonal antibodies a blue line develops signalling pregnancy.

Immunoassays can also be used to diagnose disease by detecting antigens for _____ *trachomatis*, HIV and *Plasmodium sp.* (malaria) the extent of the infection can be determined by the extent of the labelling detected.

Word Bank

labelled

complexes

fluorescent

antigens

Monoclonal

antibodies

Chlamydia



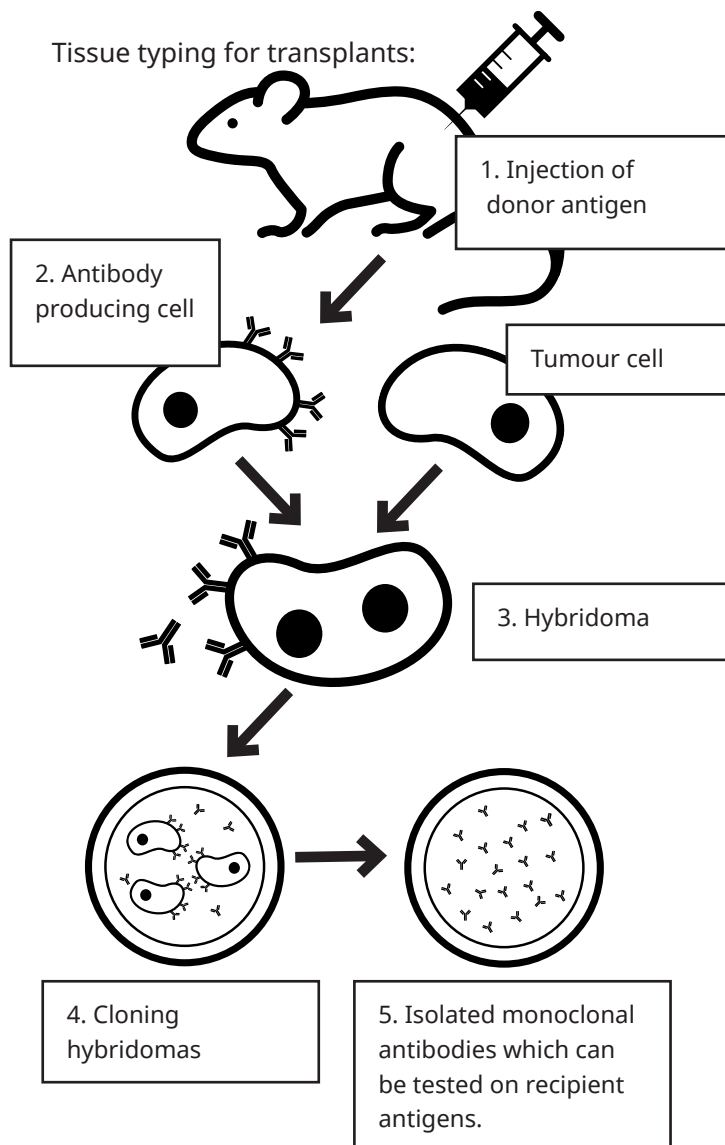
Biology

Tissue Typing

If a person requires an organ transplant they must wait until a suitable match is found. By this we mean their tissue type matches the donor organ.

A tissue type is used to determine the extent to which the immune system of the recipient of a donor organ will react against the donor organ antigens. A poor match could result in the _____ of a donor organ.

Tissue typing for transplants:



1. The donor organ _____ can be isolated from the donor and injected into a mouse.
2. The mouse B-lymphocytes will produce antibodies against the donor organ antigen.
3. The B-lymphocytes are extracted and fused with a tumour cell to produce a _____.
4. The hybridoma _____ continuously to produce many cells producing monoclonal _____.
5. These can then be cross matched with the recipients' antigens. The degree of binding will be a measure of their compatibility for transplantation.

Monoclonal antibodies have been developed which can prevent rejection. They combine with and inactivate Helper T cells without which the B lymphocytes that produce antibodies against the transplanted organ won't work.

Word Bank

Hybridoma

antigen

Antibodies

Rejection

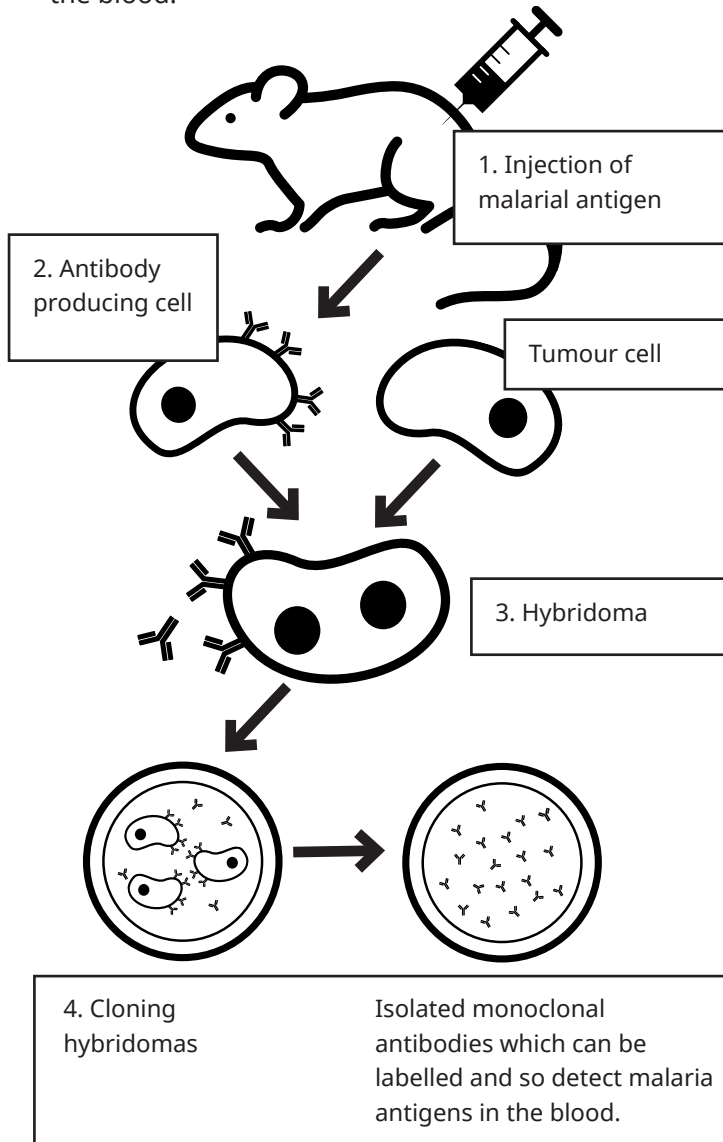
divides



Biology

Monitoring Malaria

An immunoassay can be used to detect the presence of malarial antigens (*P. vivax*, *P. falciparum*) in the blood.



1. *P. vivax* or *P. falciparum* are the parasites which cause malaria. They are injected into a _____.
2. The mouse _____ will produce antibodies against the _____ on the malarial parasites.
3. The B-lymphocytes are extracted and _____ with a tumour cell to produce a hybridoma.
4. The hybridoma divides continuously to produce many cells producing _____ antibodies which bind to malarial antigens.

Blood samples are taken from many people and their blood is tested with monoclonal antibodies.

The labelled antibodies will detect living or dead *Plasmodium* in the blood stream. This can show the effectiveness of antimalarial drugs.

Eg. If a person's blood contains the *Plasmodium* antigen but the person is not suffering the symptoms of malaria then the drugs work.

Word Bank

Fused

Mouse

Monoclonal antibodies

B-Lymphocytes

antigens

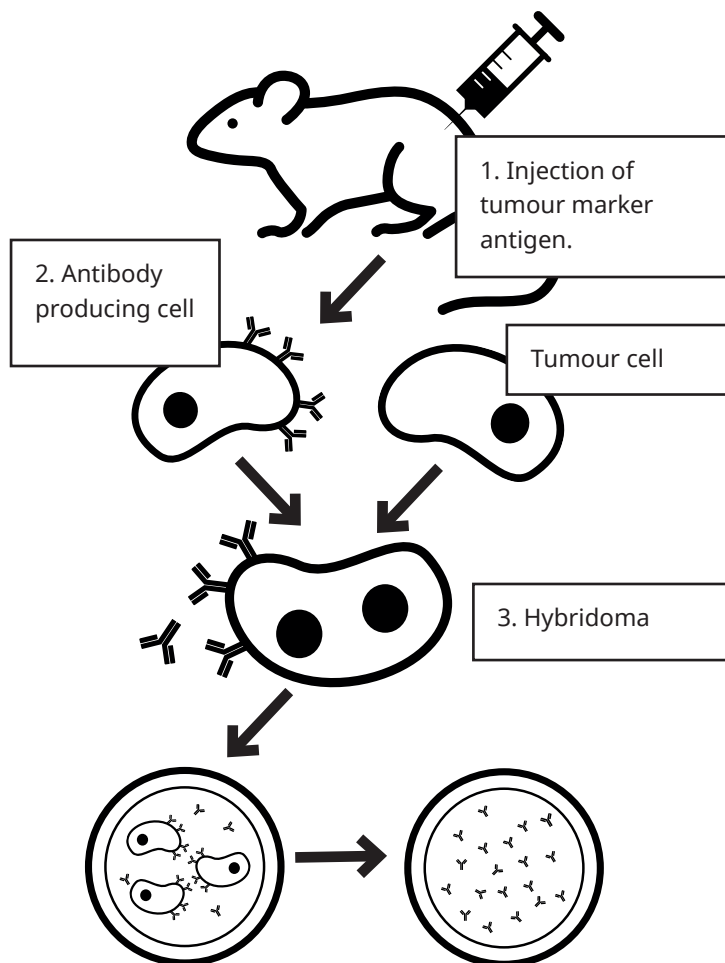


Biology

Chemotherapy for Cancer

A monoclonal antibody can be made which is specific to some types of antigen on cancer cells called tumour markers.

Anti-cancer drugs can be attached to these monoclonal antibodies and they will then deliver the drugs directly to the cancer cells.



1. The specific tumour marker can be isolated from the tumour cell and _____ into a mouse.
2. The mouse B-lymphocytes will produce _____ against the _____ antigen.
3. The B-lymphocytes are _____ and fused with a tumour cell to produce a hybridoma.
4. The hybridoma divides _____ to produce many cells producing monoclonal antibodies.

4. Cloning hybridomas

Isolated monoclonal antibodies to which anti-cancer drugs can be attached.

Word Bank

Tumour marker

injected

Monoclonal antibodies

Continuously

extracted

antibodies