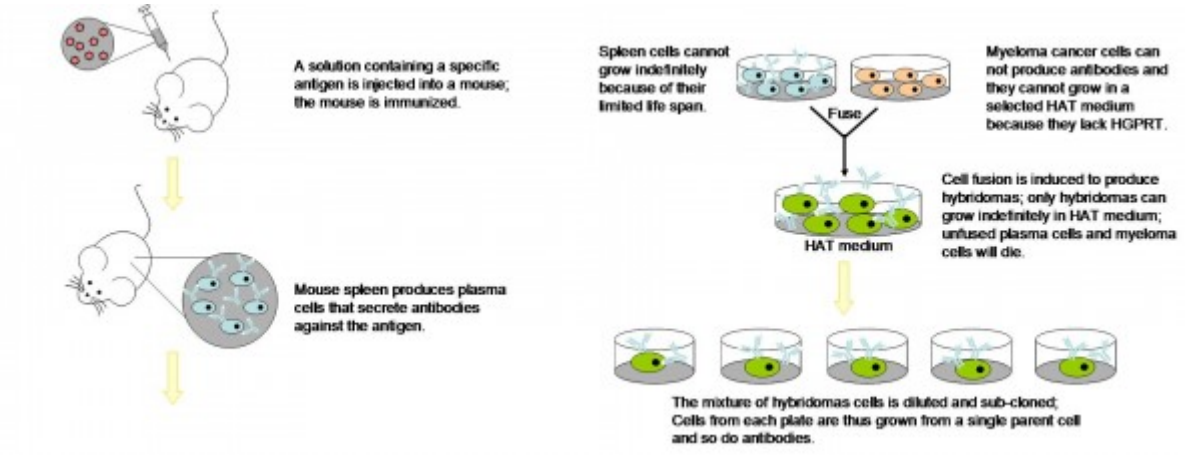
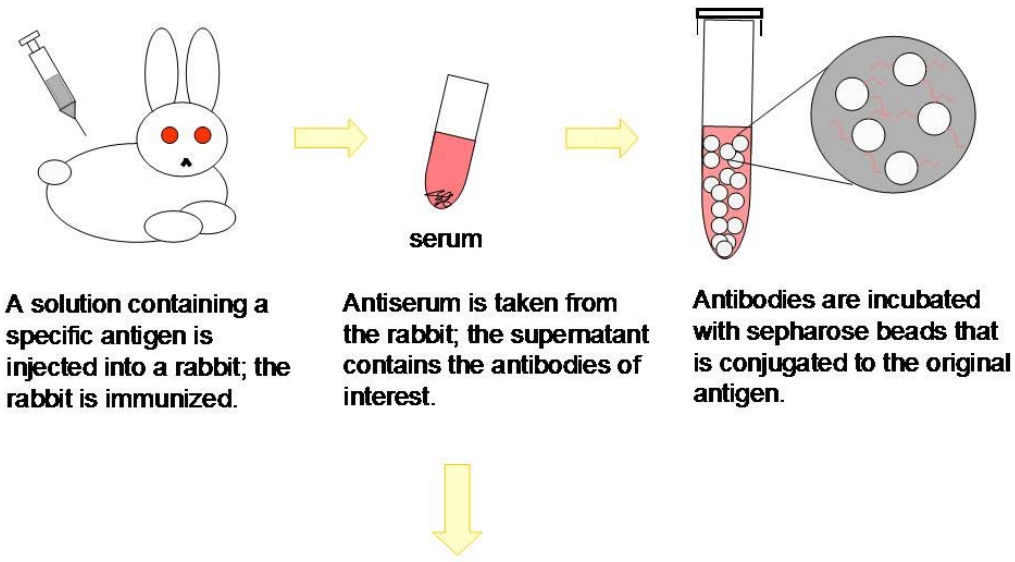
Antibody Production and Purification

There are two distinct types of antibodies: monoclonal and polyclonal. Monoclonal antibodies are produced from a single B-cell type making them highly specific to one epitope of an antigen. Since monoclonal antibodies are so specific, they might not recognize the antigen if it undergoes chemical changes or degradation. In contrast, polyclonal antibodies, which represent a mixture of antibodies, recognize multiple epitopes, making them much more tolerant of minor changes in the antigen. The recognition of multiple epitopes also means that polyclonal antibodies will more frequently cross-react with other antigens of a similar structure. In the lab, monoclonal antibodies are produced from hybridomas cells. These are made by fusing immortal myeloma cancer cells with spleen cells from a mouse that has been immunized against a desired antigen.



Polyclonal antibodies are produced by immunizing a suitable mammal, such as a rabbit. A solution containing a specific antigen is injected into the mammal. An immune response is induced and the B- cells then produce a mixture of antibodies specific to this antigen. Polyclonal antibodies can then be purified from the mammal's serum.



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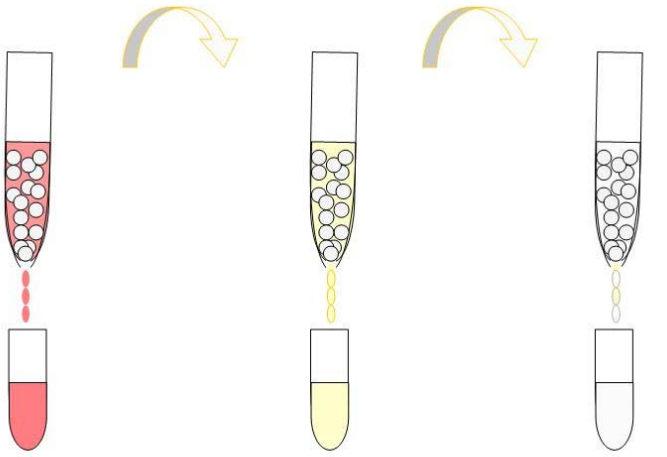

Antibodies that recognize the original antigens form a complex and are attached to the beads; unbound antibodies pass through the column, known as flow through.

The beads are washed by buffers in order to wash out the remaining unbound antibodies and weakly bound antibodies; antibodies that strongly bind to the antigen will stay.

Antibodies of interest are eluted at acidic pH by disrupting the interaction between antibodies and antigens; the eluent is required to neutralize afterwards.

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