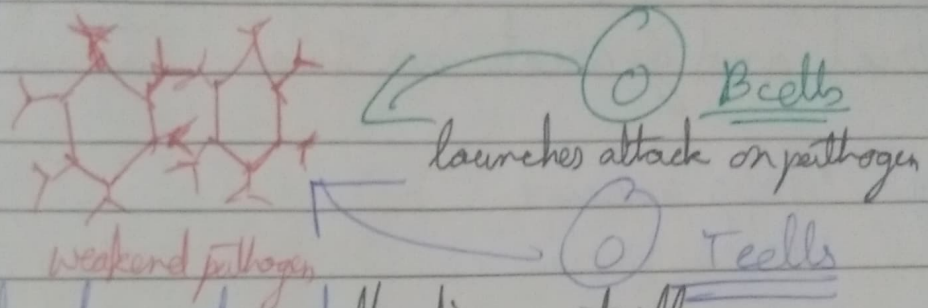
Vaccines :-

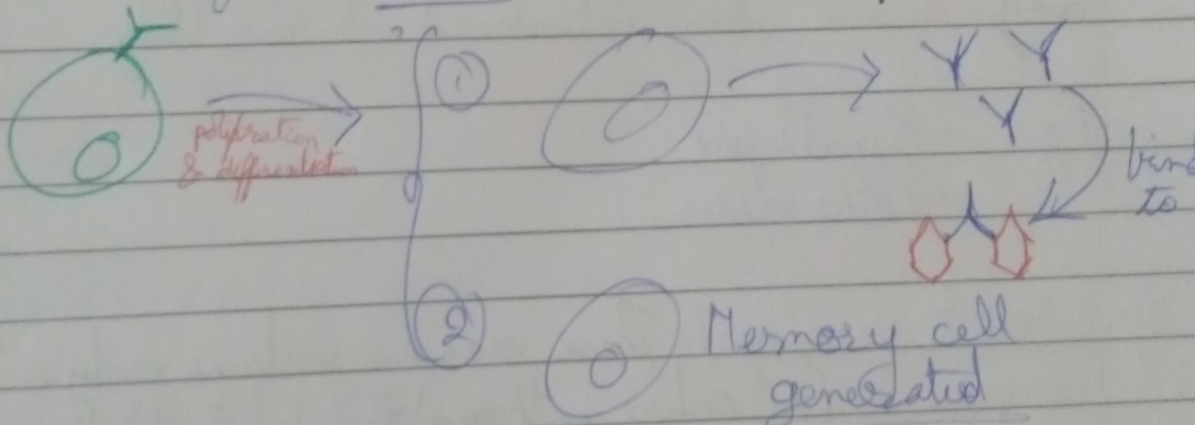
Vaccines play an important role in stimulating immune system, particularly B and T cells, to protect body from infections.

Vaccines can introduce either inactivated or weakened pathogen to the body



The body does not get the disease itself,

But the body will launch an immune response



This generated memory cell is useful because it will know how to kill the introduced pathogen, should it appear again into the body

* Both B-cells & T cells can generate Memory cells

Types of Vaccines :-

1) Inactivated Vaccines :- These vaccines contain pathogens that have been killed or inactivated so that it does not cause any disease when its introduced into our body

Our immune system still recognises this pathogen as a threat and generates an Immune Response

Eg :- • Polio vaccine
• Rabbies vaccine

2) Live attenuated vaccines :- These vaccines contains live pathogens that have been severely weaked such that they cannot cause any disease when introduced into our body.

Eg :- • Small pox
• Potas virus

3) Subunit vaccines :- These vaccines contains only antigenic components (not entire pathogen) that best stimulate immune response

Eg :- • Hepatitis B vaccine
• HPV vaccine

4) Toxoid vaccines :- These vaccines contains inactivated toxins secreated by certain bacteria
Effective for preventing diseases caused by bacterial toxins

Eg :- • Diphtheria vaccine
• Tetanus vaccine

3) DNA vaccines :- These vaccines contain genetically engineered DNA. It is a new approach for induction of humoral and cellular immune responses to protein antigens.

It is still in experimental stage.

4) Peptide vaccines :- These vaccines contain short chains of amino acids derived from pathogen's proteins to stimulate immune response.

Eg :- • HIV vaccine
• COVID-19 vaccine

Vaccines yet to be developed :-

1) HIV/AIDS

2) Malaria

3) Cancer caused by smoking

4) Rheumatoid arthritis

5) Diabetes