

LAKSHYA 2.0

NEET 2024



- Subject - Zoology
- Chapter - Human Health and Disease

Lecture No.- 07



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Topics to be covered

1

T- cells

2

B- cells

3

Types of Antibodies

4

Antigen



T-Lymphocytes (T-cells)



① T_H = T-Helper cell (CD₄ cell)

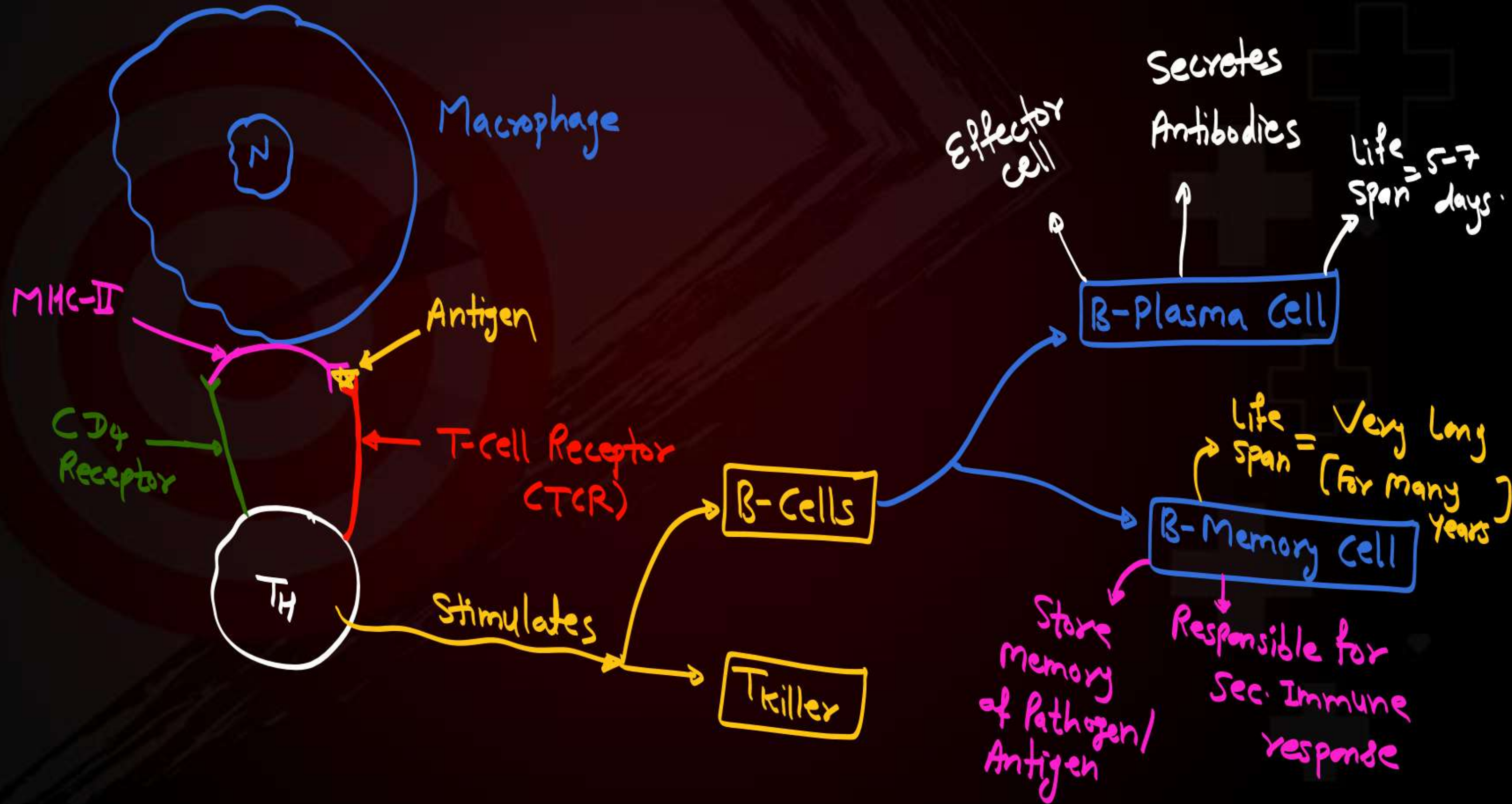
↳ They stimulates specific T_{Killer} and B-cells.

↳ They recognise MHC-II, which are located on the surface of Antigen Presenting cells. [Eg:- Macrophage, B-cells, dendritic cells]

MHC = Major Histocompatibility Complex

→ Surface Proteins.

→ They help in recognition of Self and Nonself tissues.



② T_K = T-Killer / T_c = T-Cytotoxic Killer / CD8 cells

↳ They recognise **MHC-I**, which is expressed on the surface of all nucleated cells of the body.

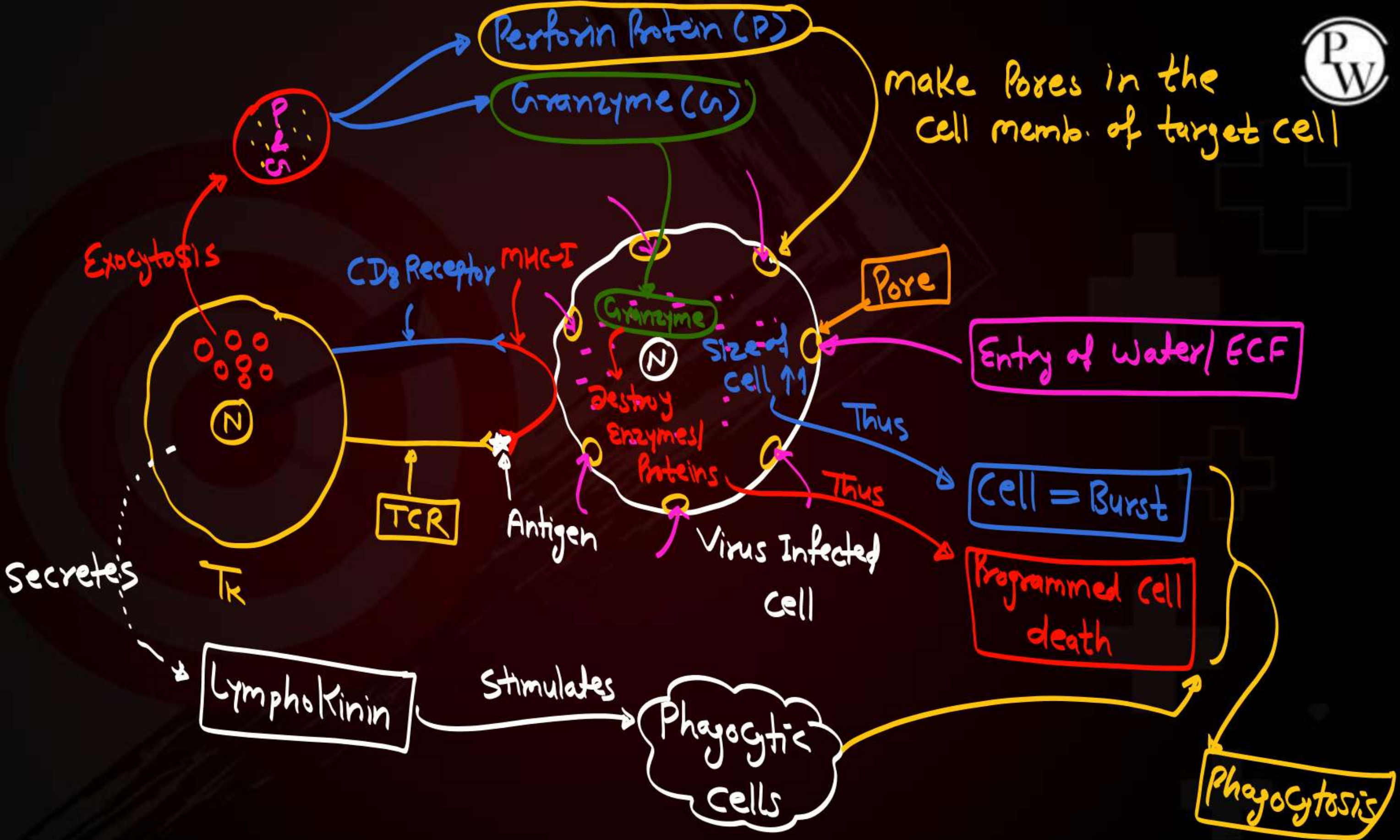
↳ They work on **Endogenous** antigens.

Target Site

Virus Infected cells

Tumour/Cancer cell

Transplanted organ



✓③ $T_s = T$ -Suppressor cell \Rightarrow

↳ They suppress activity of T_k and B -Cells.

↳ They help in discrimination between Self and Nonself antigens.

✓④ $T_m = T$ -Memory Cells :-

↳ They store memory of Antigen/Pathogen

↳ Responsible for Sec-Immune Response.

Topic : Antigen

They are Glycoproteins / Glycolipids / Polysaccharides, which are located on the surface of Pathogen.

Each antigen has more than one types of antigenic sites (many different types of) antigenic sites called as Epitopes.

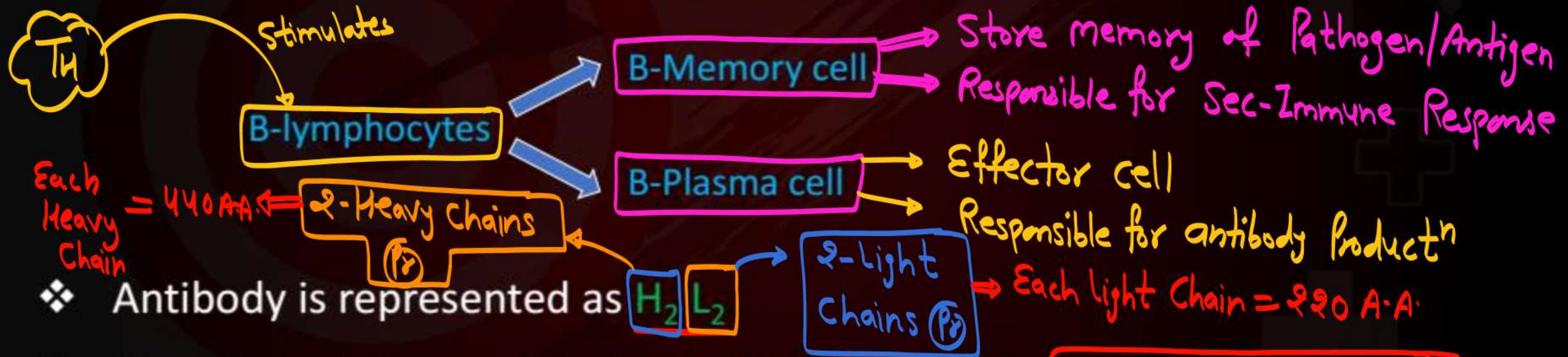
They stimulate Immune System for production of antibodies.



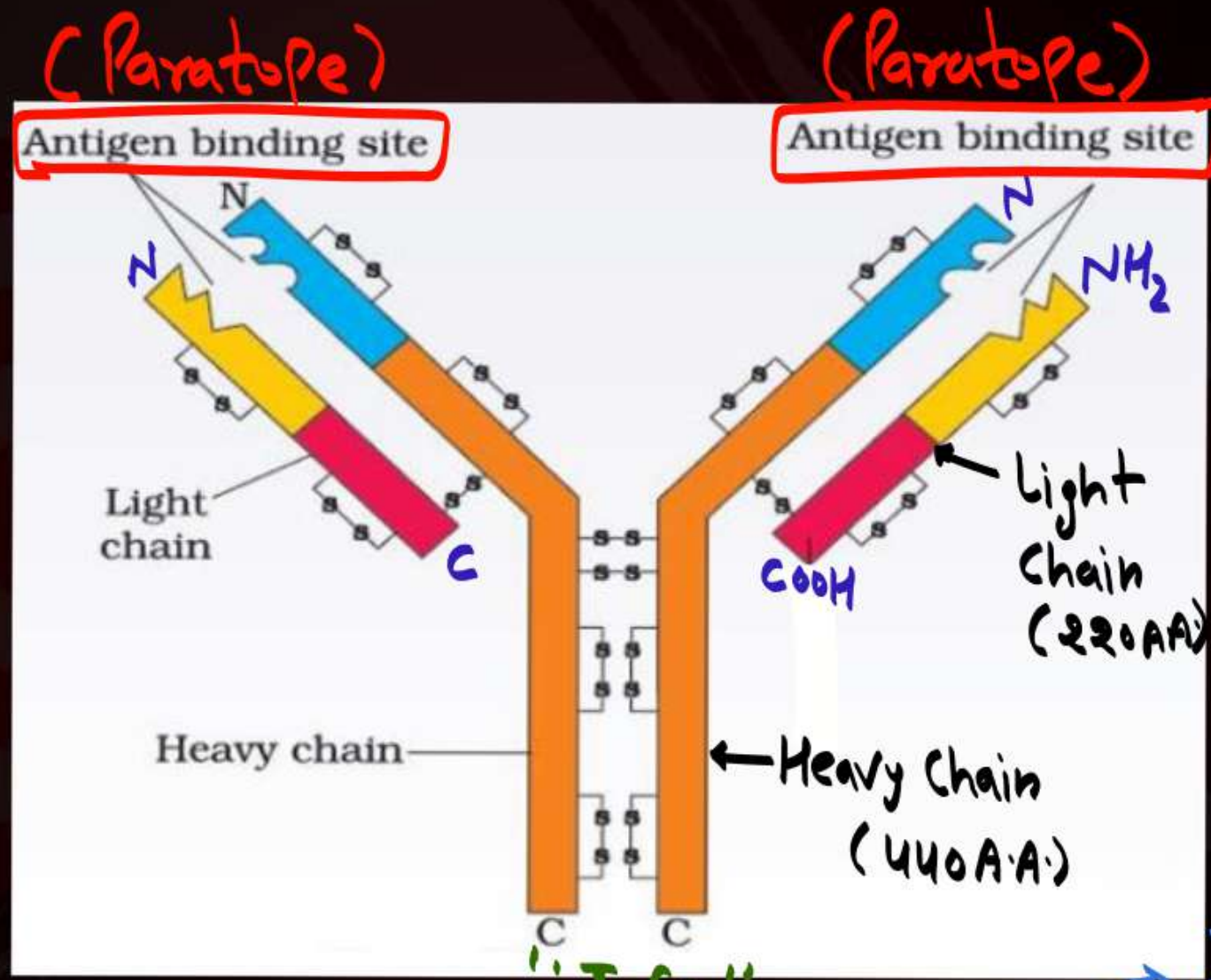
They bind to the antigen binding site of antibody (Paratopes)

Antibody or Immunoglobulin (Ig)

- ❖ These are **complex glycoprotein molecule**, produced in response to antigenic stimulation. *(Always)*
- ❖ Antibodies are produced by **B-lymphocytes**.



- ❖ Antibody is represented as **H₂L₂**
- ❖ Two chains held together by **disulphide bonds** in **shape of Y molecule**



(Paratope)

(Paratope)

called **Variable region**

as Located at N-Terminal of antibody.

No. of Paratopes = 2

Total no. of disulphide Bonds = **16**

IgG
[Monomeric]

Intermolecular disulphide bonds = **4**

Intramolecular disulphide bond = **12**

Types of antibodies



① γ -Immunoglobulin (IgG) \Rightarrow = 80%

- \hookrightarrow Smallest antibody
- \hookrightarrow It can cross Placenta
- \hookrightarrow Responsible for Secondary Immune Response
- \hookrightarrow Provide protection to body fluids / Humors.
- \hookrightarrow Monomeric Str.
- \hookrightarrow No. of Paratopes = 2



② α -Immunoglobulin (IgA)

- \hookrightarrow 10-15%
- \hookrightarrow Provide protection to body surface
- \hookrightarrow found in Saliva, Tears, Colostrum etc.
- \hookrightarrow Dimeric Str.
- \hookrightarrow No. of Paratopes = 4

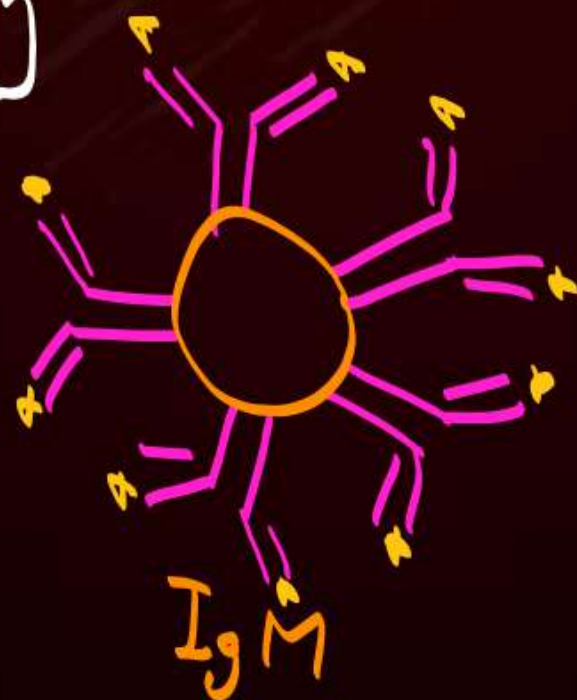


③ μ -Immunoglobulin (IgM)

- ↳ 5-10% ✓
- ↳ Largest and heaviest antibody. ✓
- ↳ Responsible for Primary Immune Response ✓✓

↳ 1st formed antibody during active infection of pathogen.
★ [Oldest antibody]

- ↳ Pentameric str.
- ↳ No. of Paratopes = 10



④ D-Immunoglobulin (IgD) PW

- ↳ 1-3% ★
- ↳ Form B-Cell Receptor
- ↳ monomeric str.
- ↳ No. of Paratopes = 2

⑤ E-Immunoglobulin (IgE) ★

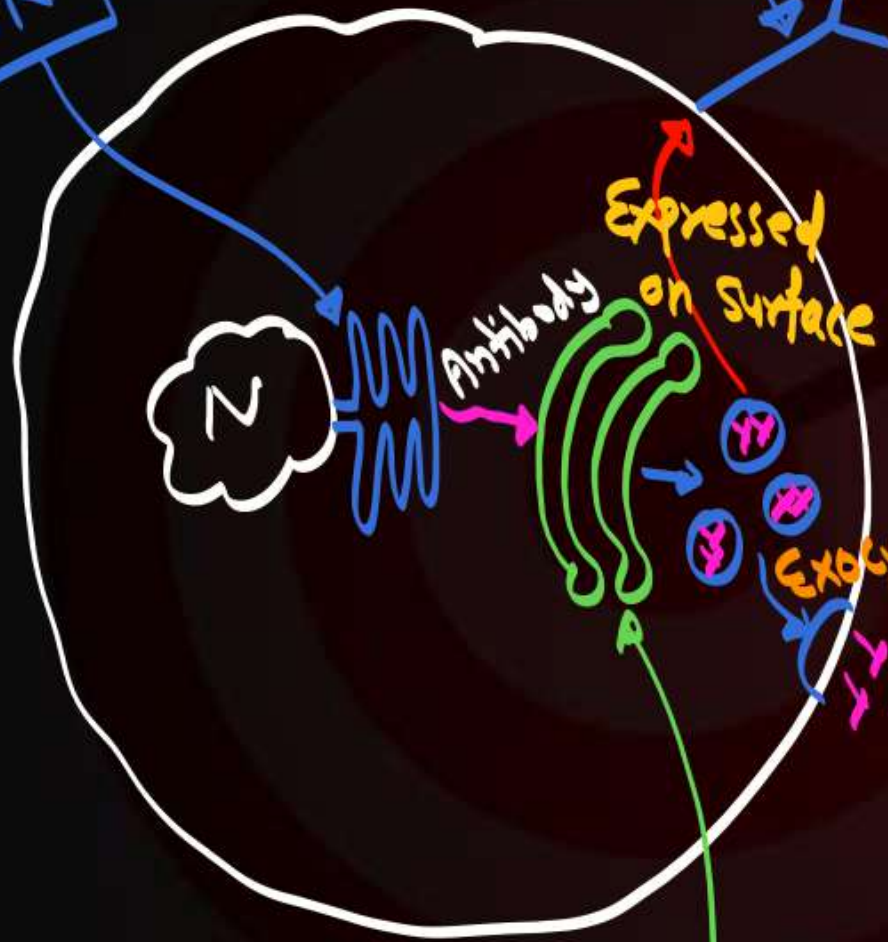
- ↳ < 1%
- ↳ Responsible for allergic Rxn ★
- ↳ monomeric str.
- ↳ No. of Paratopes = 2 ★

Site of antibody production

B-Cell Receptor

Made up of **IgD** or **IgM** (Monomeric)

RER



B-Plasma cell

Golgi body

Packaging of Antibody into vesicles

Gamma (Water Soluble) antibody

Immune Response

Present into the Blood

(i) Agglutination

Antigen-antibody Interaction takes place

Clumping / Immobilisation of Pathogen
Then Phagocytosis by Phagocytic cells.



(ii) Opsonisation

By **IgG** & **IgM**



Tagging / marking / Coating of Pathogen By Antibodies
Then Phagocytosis by Phagocytic cells.

(iii) Neutralisation :-



Antigen
←←←←

Binds
to



Antibody

Neutralise

Nontoxic
Substance

A top-down view of a terracotta bowl filled with several round, white, glistening Rasgullon sweets. The bowl has a textured, ribbed exterior. The background is dark and out of focus.

Rasgullon Ki Adalat

Choose the incorrect statement about vaccination. [Pg-152,E]

- A) ~~In passive immunization, preformed antibodies are injected in the body.~~ X
- B) Vaccines can be produced using recombinant DNA technology. ✓
- C) Vaccines generate memory B-cells and T-cells. ✓
- D) Vaccines given in case of snakebite contains preformed antigens. ✓



Homework

Immunity 33 - 75 → Exercise - Ist

NCERT Based Questⁿ → Exercise - IInd

THANK

You...

