رَبِّ زِدْنِي عِلْمًا

اللَّهُمَّ أَرِنِى حَقِيقَةَ الْاَشْيَآءَ كَمَا هِىَ

"O Allah! Show me the reality of all things as it (really) is.."

IMMUNITY

Tayyab Hamid (MBBS, PhD)

LECTURER in Physiology

HEMATOPOIESIS

LEUKOPOIESIS

Myelopoiesis
(IL-1,3,GM-CSF, N-CSF)

- Granulocytes
- Monocytes

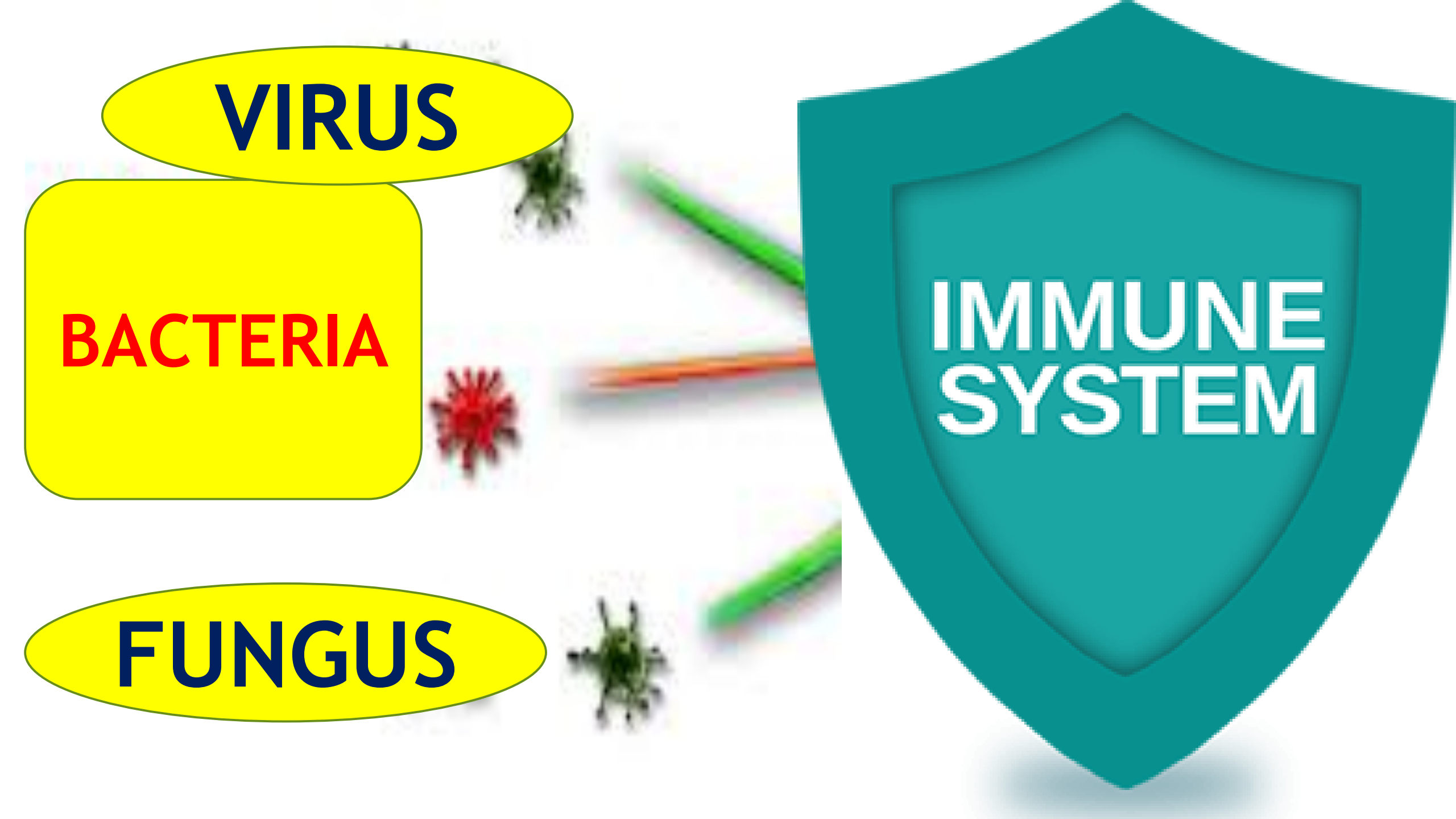
Lymphopoiesis
(IL-2,7,12,15)

- Lymphocytes

Why One has to wait for 48 to 72 Hrs after PPD skin test?

A 3 month old brought to ER with recurren infections. Her brothers also died from disseminated mycobacterial infection during infancy?

APCs show less interaction with T-lymphocyte. Observed effect due to less expression of which molecules?


VIRUS
BACTERIA
FUNGUS
IMMUNE SYSTEM

1.BARRIERS
2. INFLAMMATORY CELLS
3. NATURAL KILLER CELLS

Innate Immunity

Adaptive Immunity

1. Humoral Immunity
(Active , Passive)
2. CMI

Innate Immunity

Adaptive Immunity

TISSUE DAMAGE - CELLULAR RESPONSE

1

ENDO

PHAG

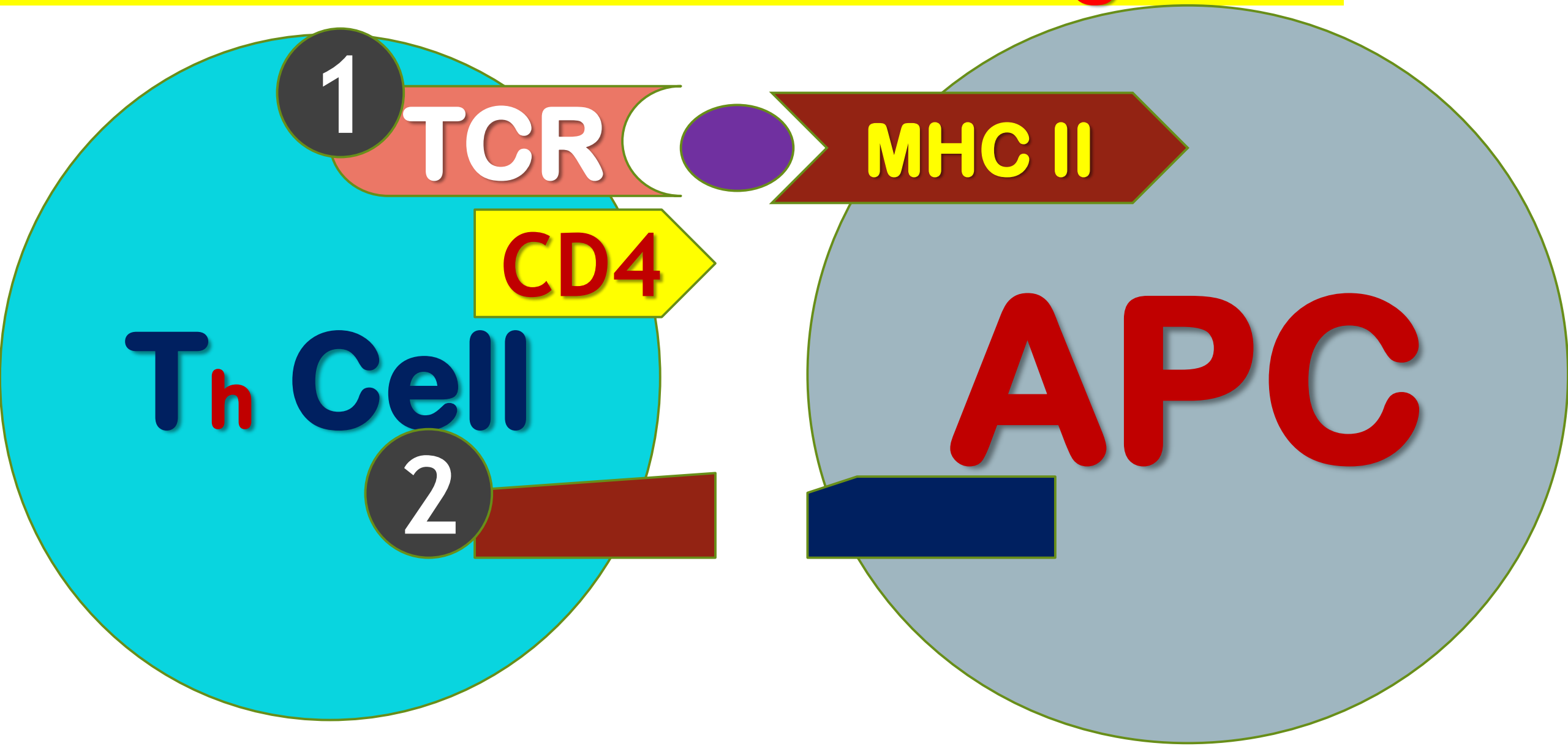
Antigen Presentation

- what is Antigen?
- Which cells present Antigen? (Dendritic Cells, Macrophages, B cells)
- To Whom is Antigen Presented?

T - Lymphocyte

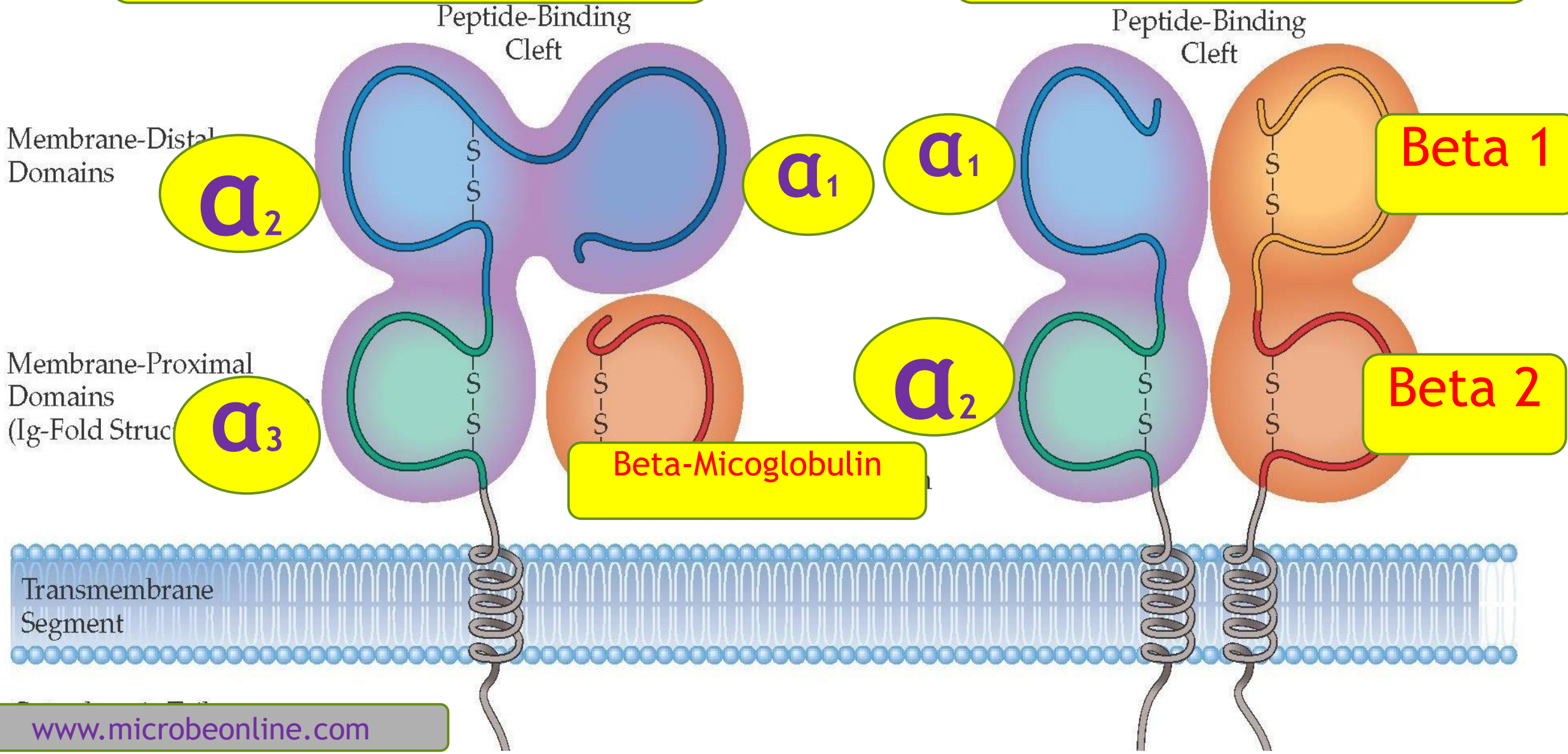
- T – cell Matures in ***Thymus***, only those survive which differentiate **"self from nonself"**
- **HelperT cells CD4+ve** (Th1, Th2, Th17, Treg)
- **Cytotoxic T cells CD8+ve**

T CELL ACTIVAION – Two Signals



MHC Class I

MHC Class II



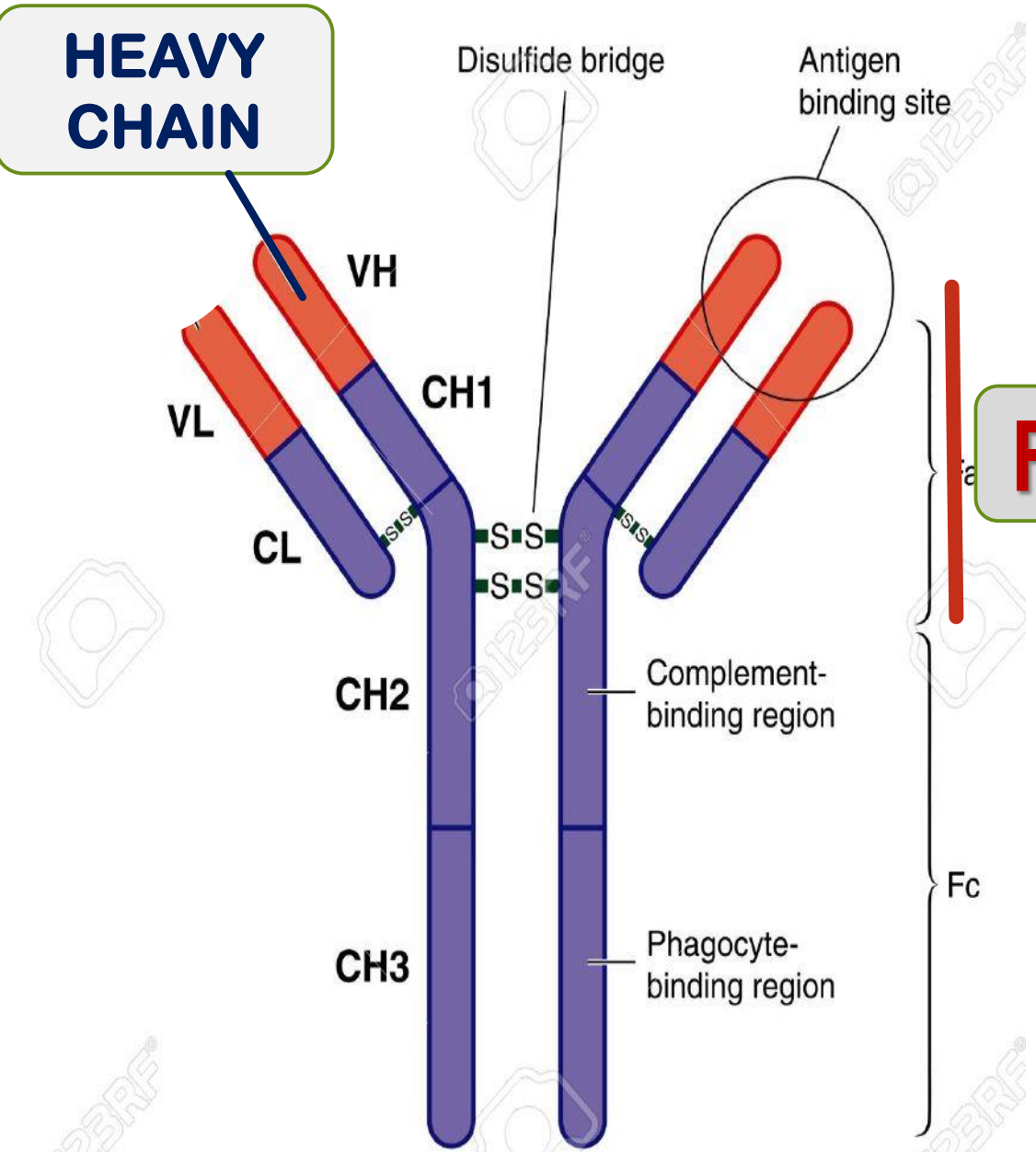
APC activates
Helper T cell

Th1/Th2 cell secrete cytokines

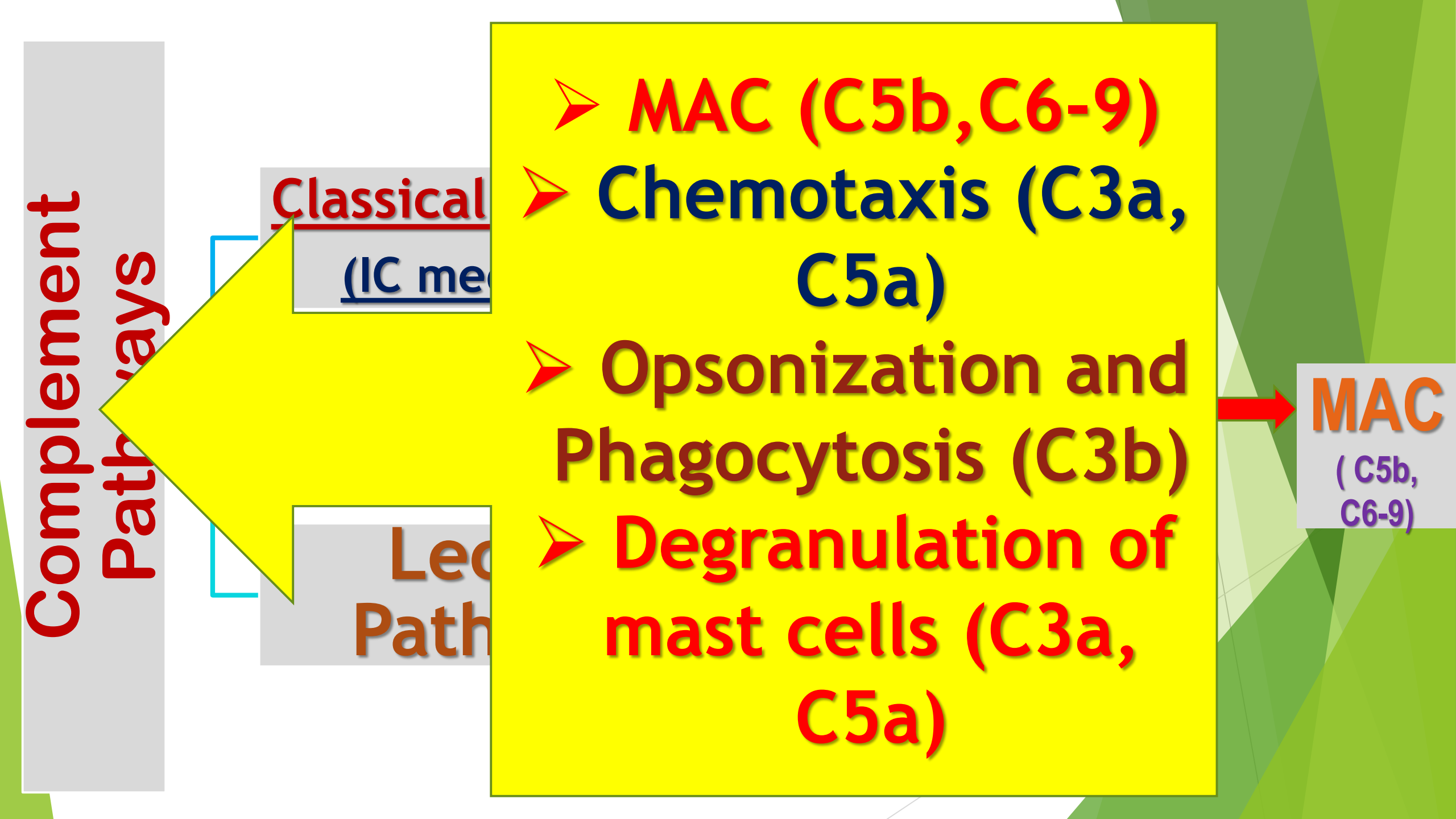
1. Stimulate B cells (trans
Plasma cells) to pro
antibodies
2. Activate Macropha

- Complement Pathway Activation
- Opsonization
- Neutralization

BLOOD GROUPS

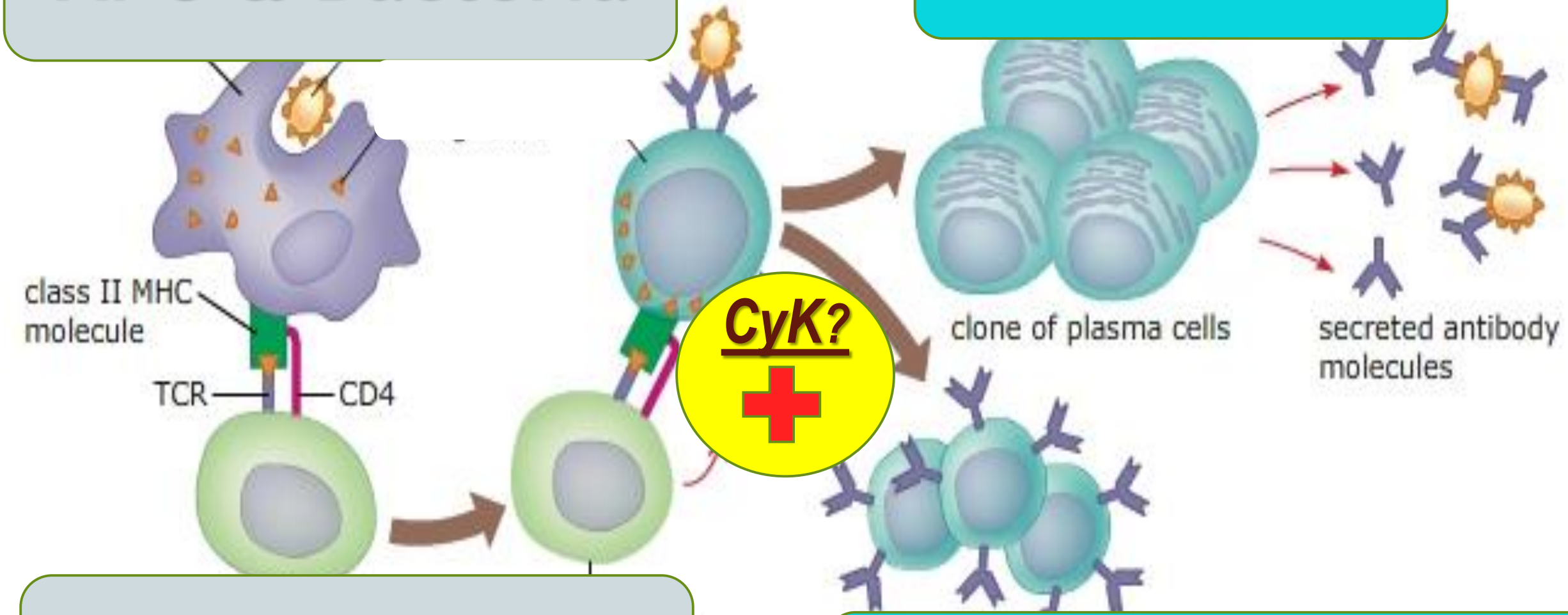


- **Antibodies** are immune system-related proteins consisting **of two heavy chains & two light chains.**
- The chains join to form a **"Y" shaped molecule**
- IgM, IgG, IgA, IgD, and IgE are five classes


Complement Pathways
Classical
(IC me
Lec
Path
MAC (C5b,C6-9)
Chemotaxis (C3a, C5a)
Opsonization and Phagocytosis (C3b)
Degranulation of mast cells (C3a, C5a)
MAC
(C5b, C6-9)

APC & Bacteria

PLASMA CELLS



Helper T cell

MEMORY B CELLS

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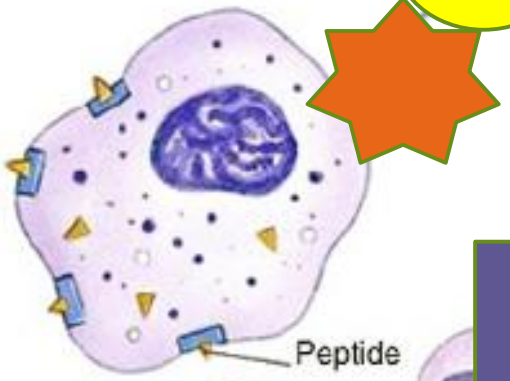
Type I Hypersensitivity

APC & Ag Presentation

Ag



IgE

1st Exposure

- Anaphylaxis
- Allergic Rhinitis
- Asthma

Type II Hypersensitivity

- Attachment of Ab (IgG or IgM) against antigen or receptor on target cell (HDN, myasthenia gravis).
- Activation of complement system. Macrophages have receptors for IgG & C3b – more susceptible for phagocytosis (Opsonization)
- ADCC involves of death of target cell without complement activation.

Peforins secreted by Effector cells (NK) as they have Fc-receptors and get activated

Type III and type IV Hypersensitivity

- IC deposit in target tissue (complement activation and phagocyte recruitment)

(glomerulus – glomerulonephritis
Synovial membrane – rheumatoid arthritis)

- Type IV – Delayed reaction hypersensitivity

NO antibodies involved; CD4 and CD8 T cells involved

Immunity

- Loss of self-tolerance and autoimmune diseases