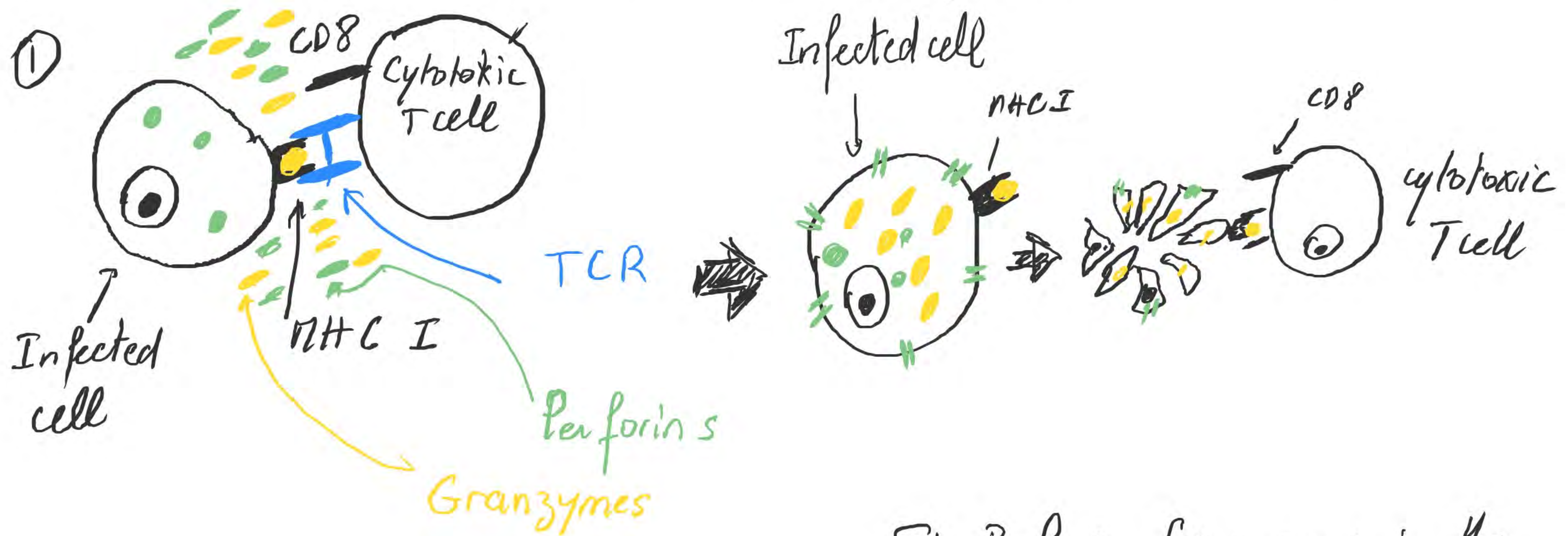


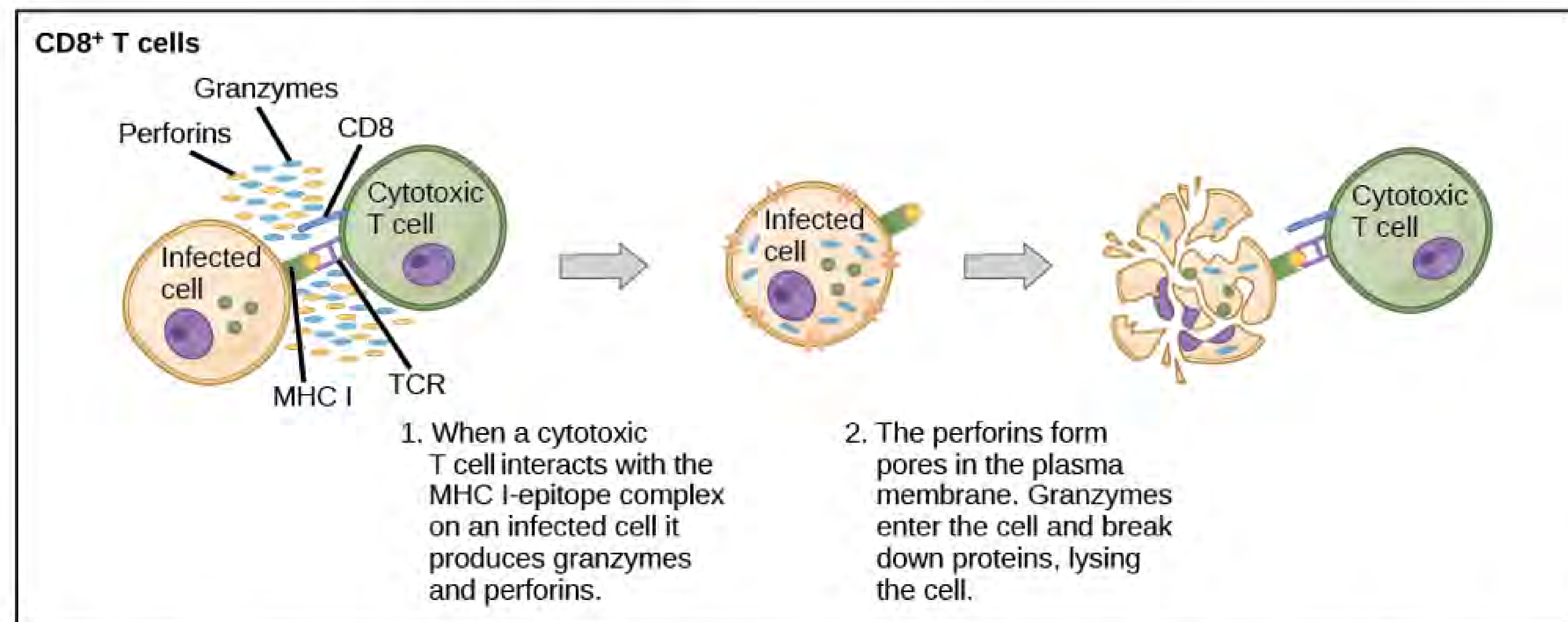
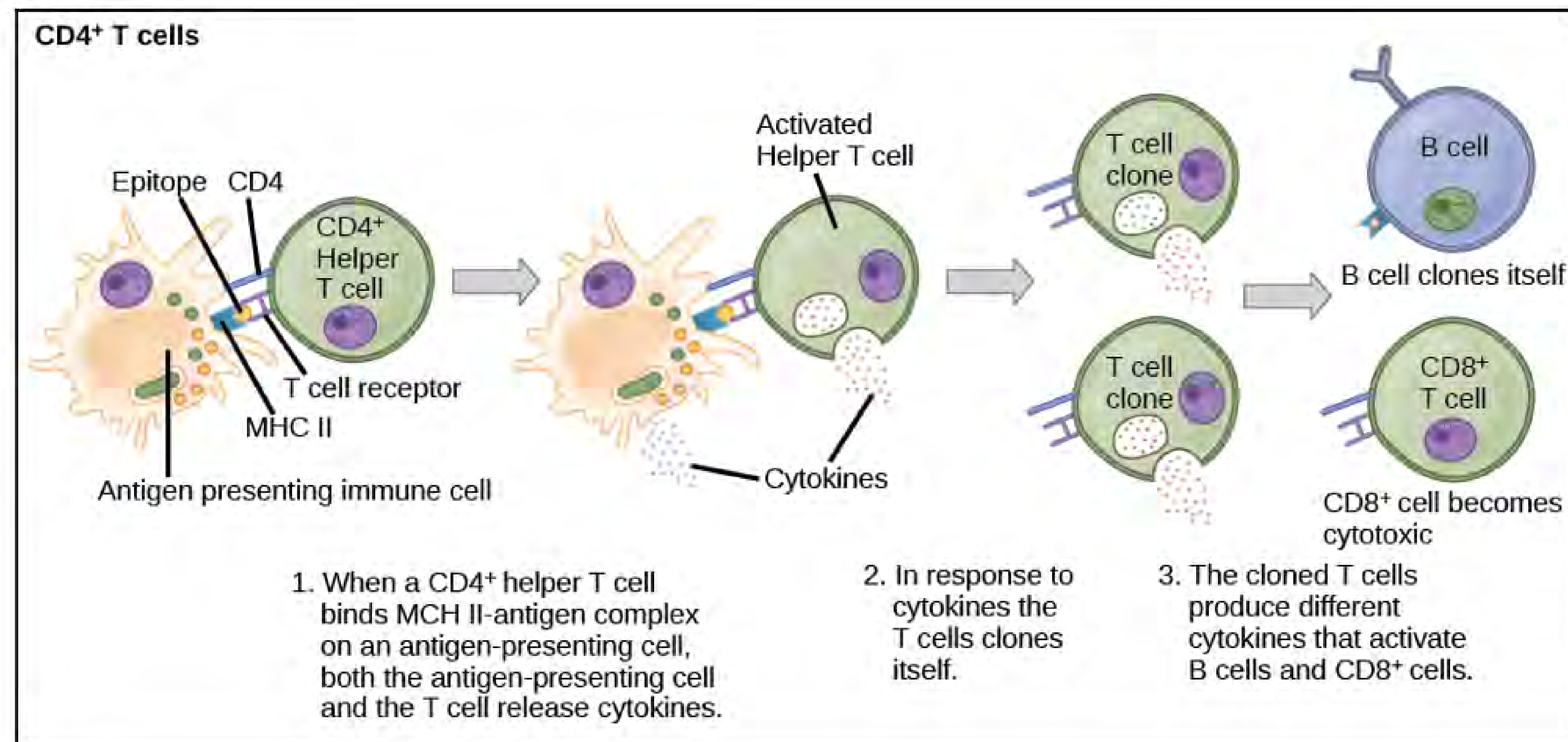
in the last class \rightarrow $CD8^+$ T cells (they become toxic!)



① When a cytotoxic $CD8^+$ T cell interact with the MHC I-epitope complex on a **infected cell** it produces: **Perforins**.
Granzymes.

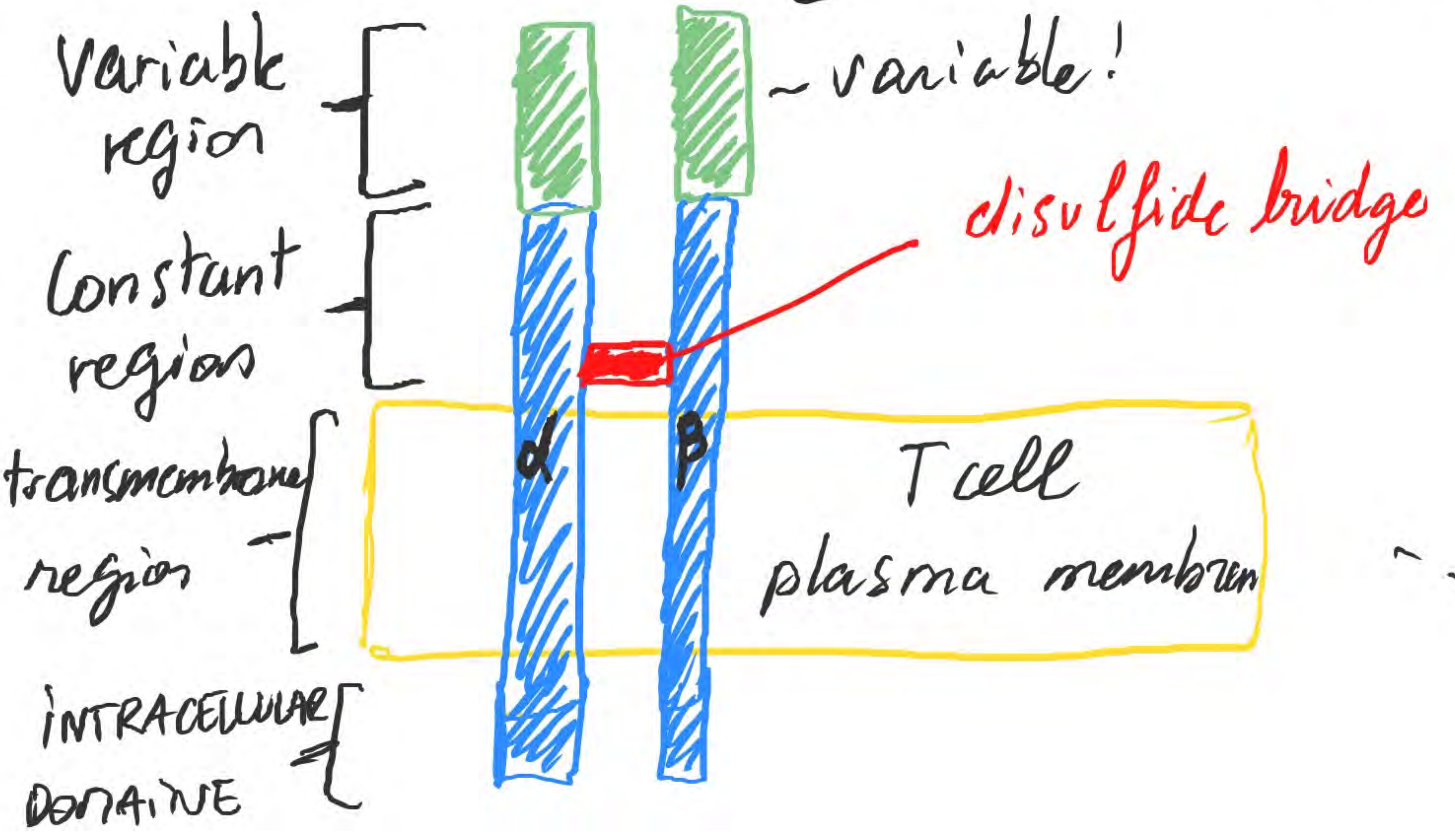
② Perforins form pores in the plasma membrane. Granzymes enter cell and break down proteins, lysing the cell.





Naïve CD4⁺ T cells engage MHC II molecules on antigen-presenting cells (APCs) and become activated. Clones of the activated helper T cell, in turn, activate B cells and CD8⁺ T cells, which become cytotoxic T cells. Cytotoxic T cells kill infected cells.

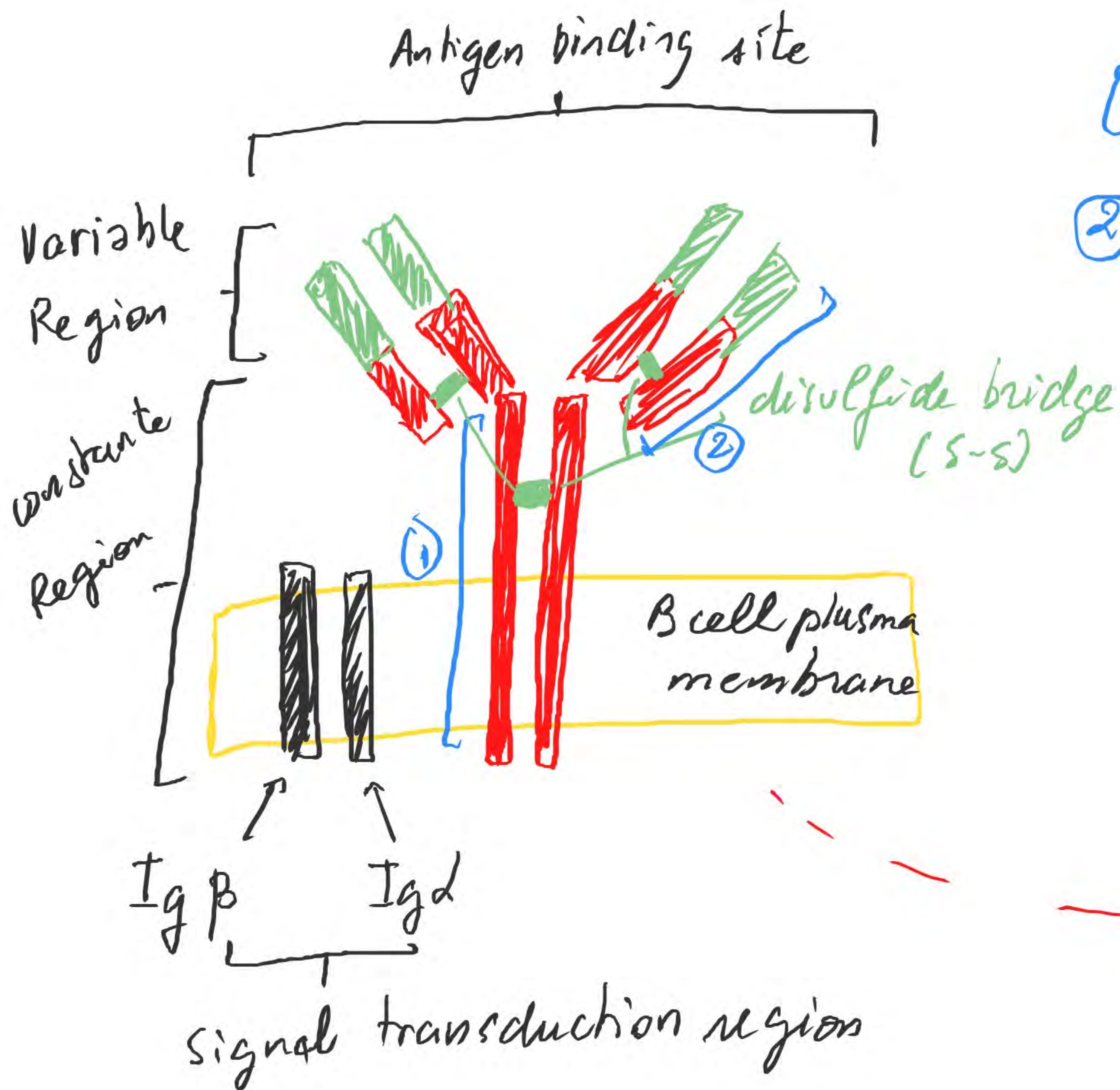
The T cell receptor: α & β I, α & β II ... on APC (antigen presenting cells)



B-cell receptor

① Heavy chain

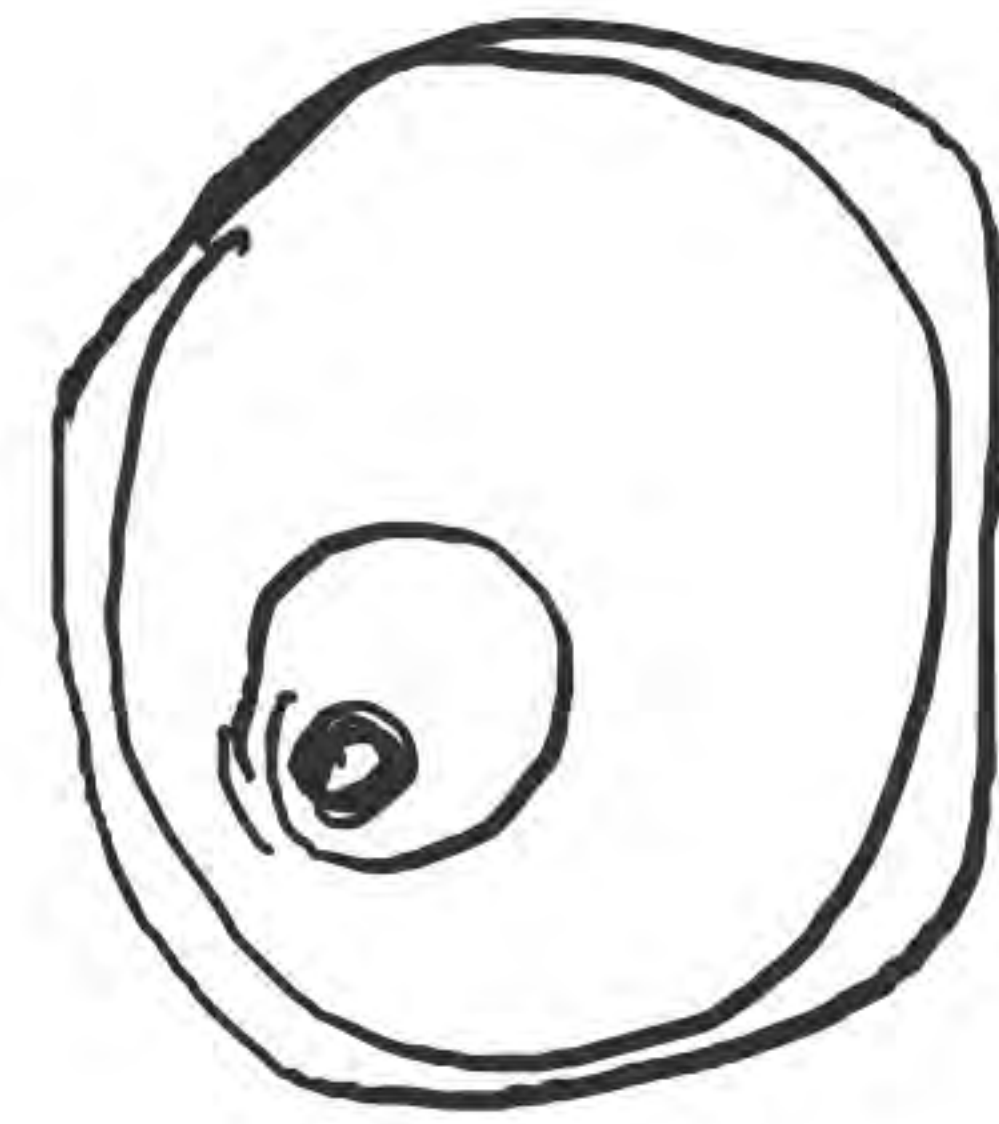
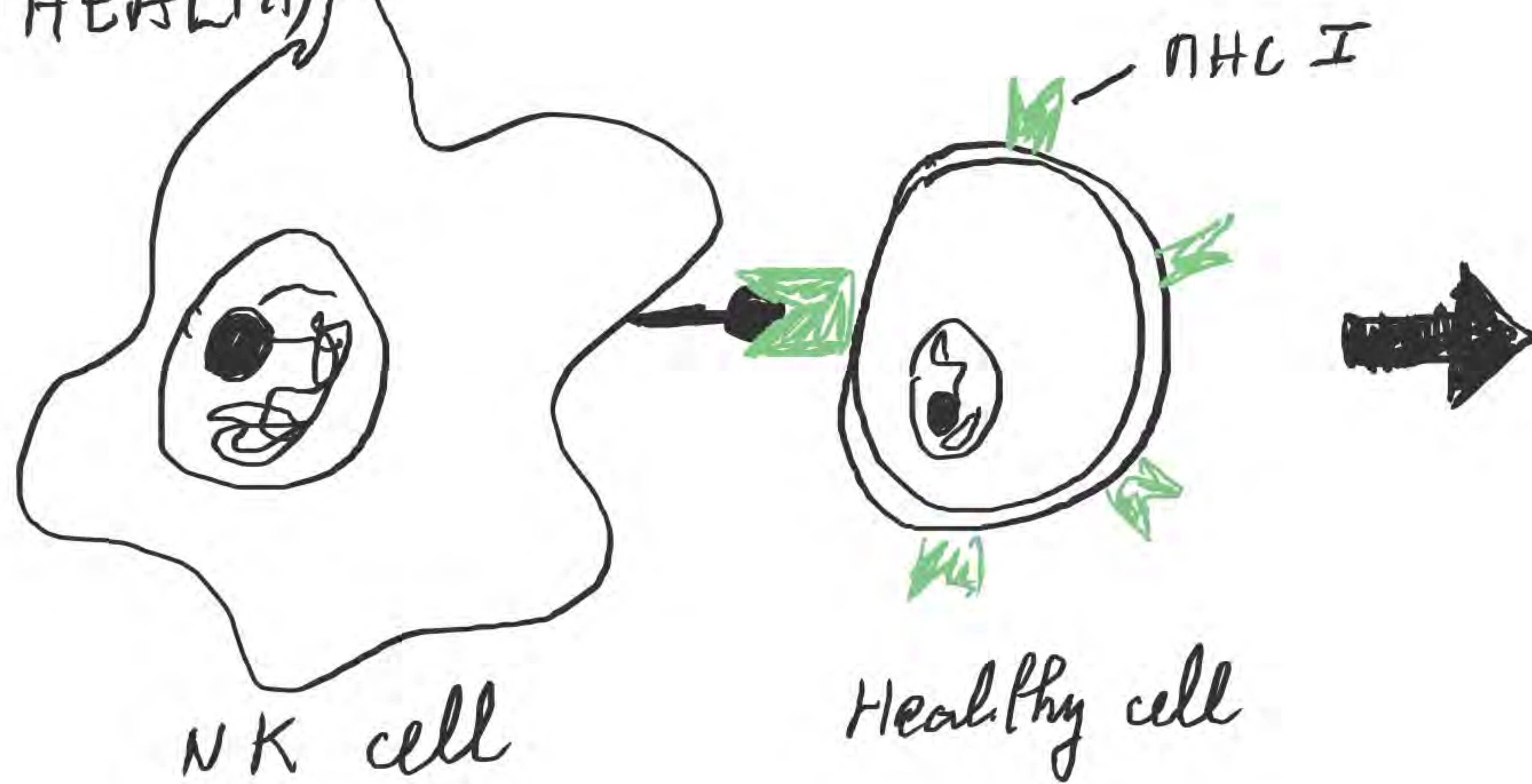
② Light chain



- * inside B-cell membrane
- * bind a variety of antigen through its variable region
- * The signal transduction region transfers the signal into the cell.

The Natural Killer cell (NK)

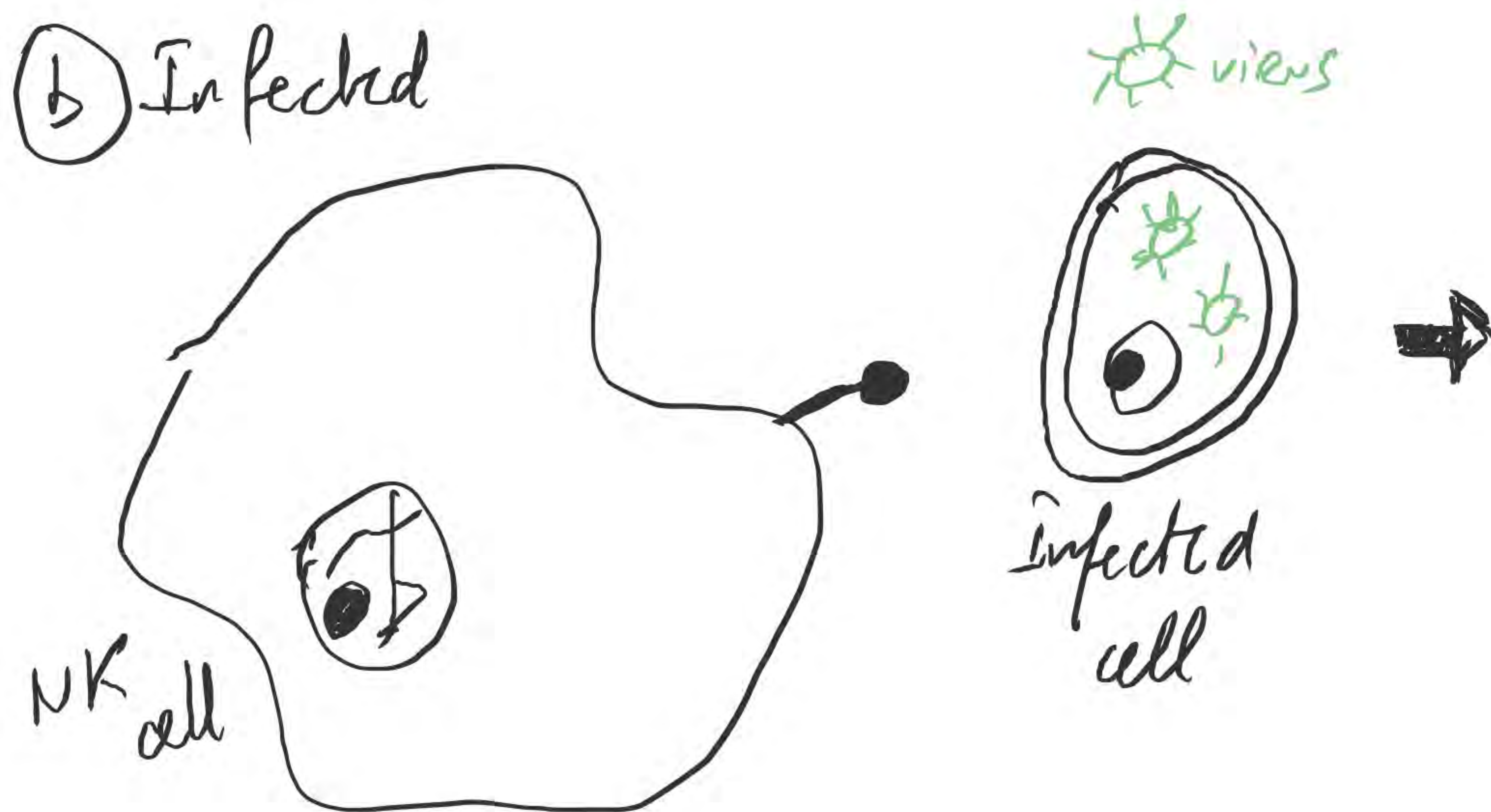
(a) HEALTHY



A NK cell recognizes MHC I on a healthy cell and DOES NOT kill it.

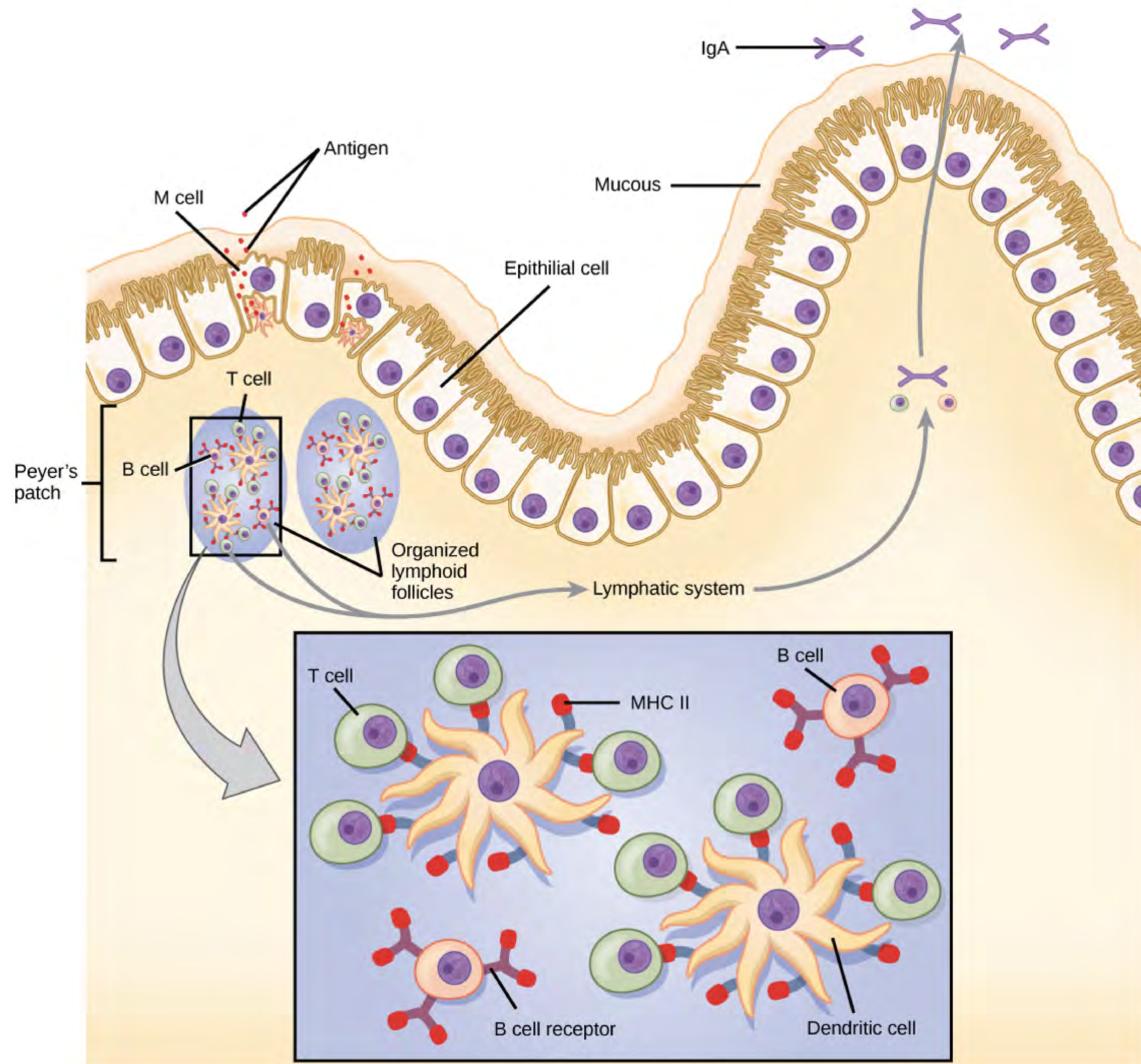
cell continues...

(b) Infected



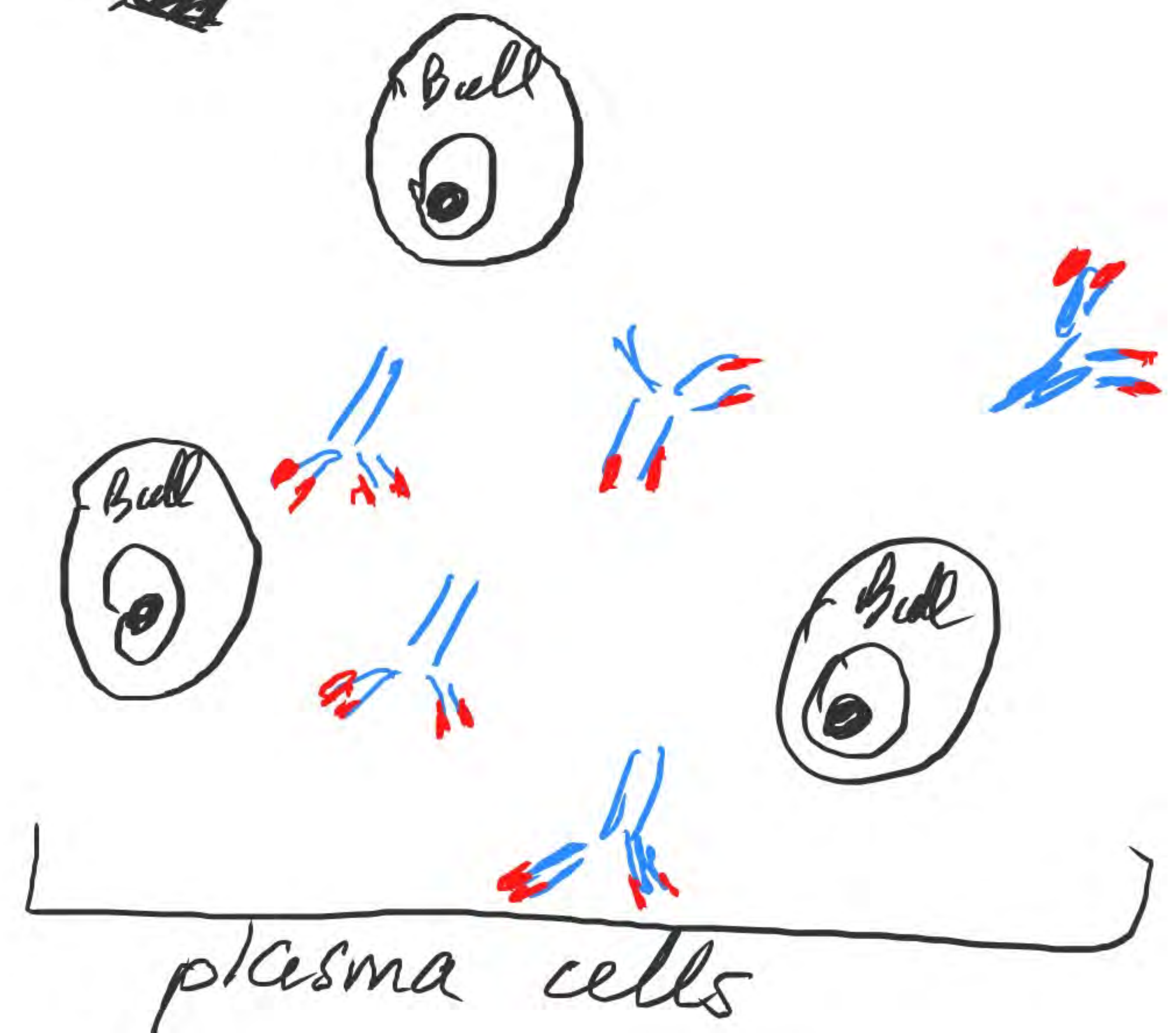
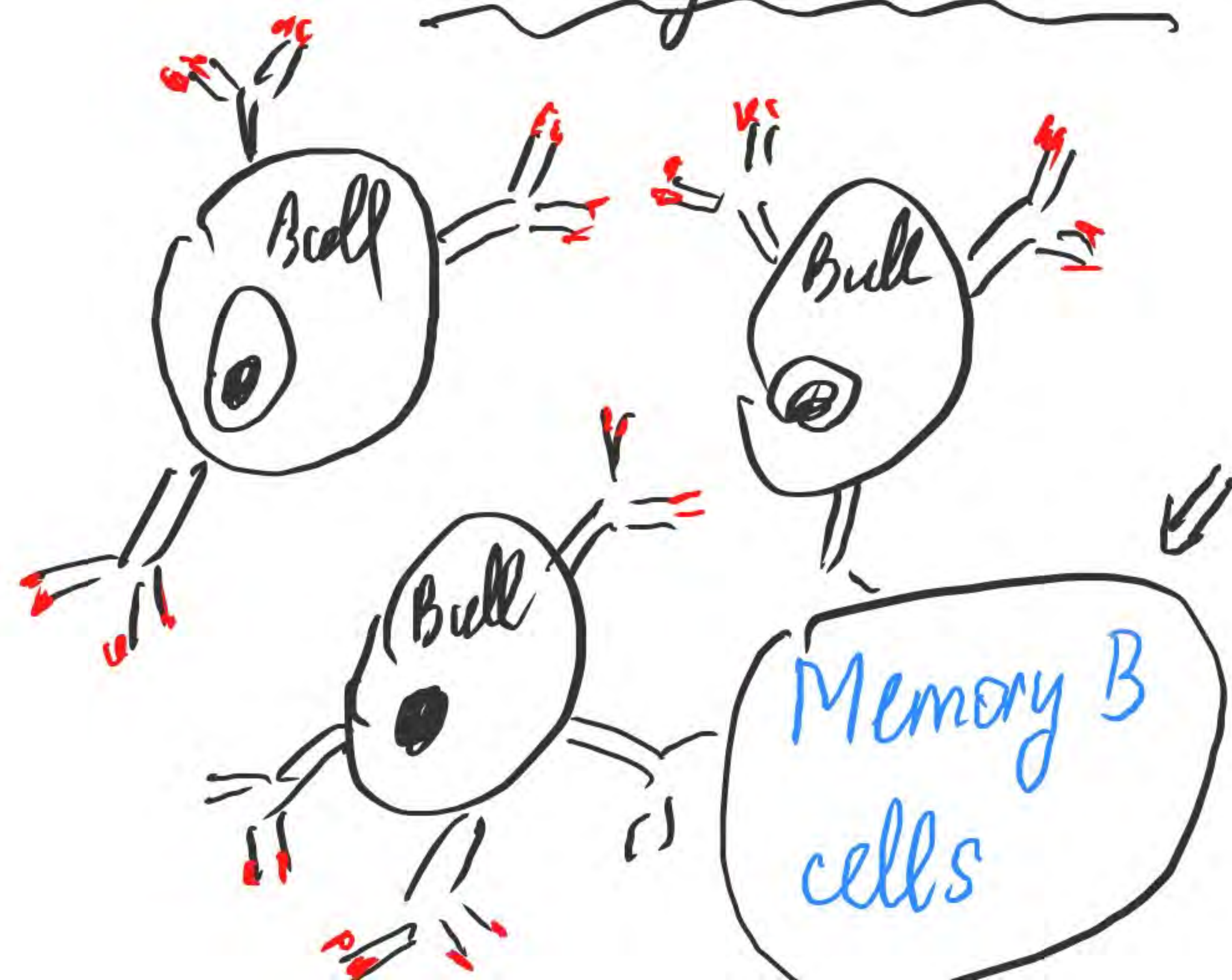
NO MHC I receptor.

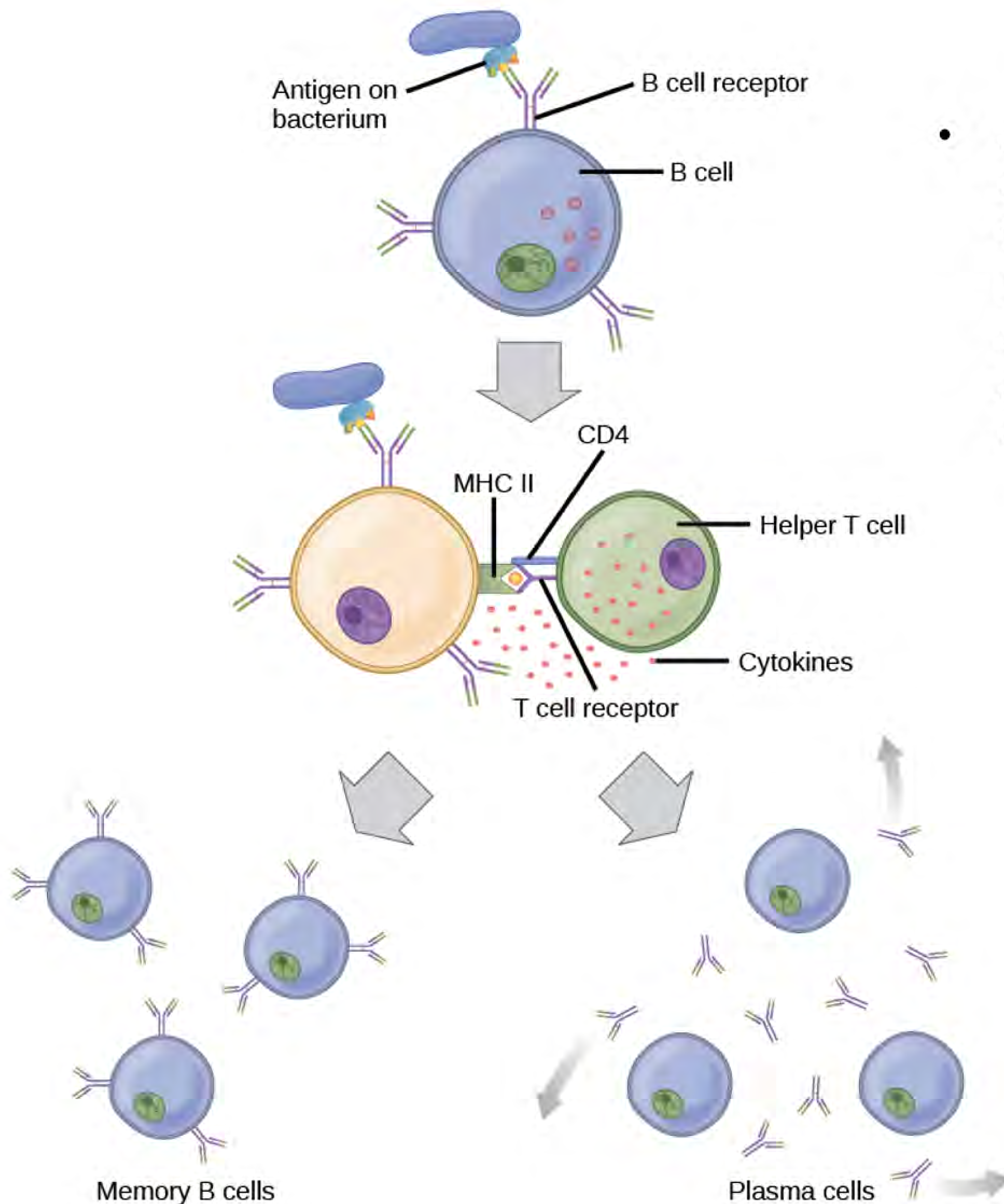
cell is lysed!





Cloning of B cells:



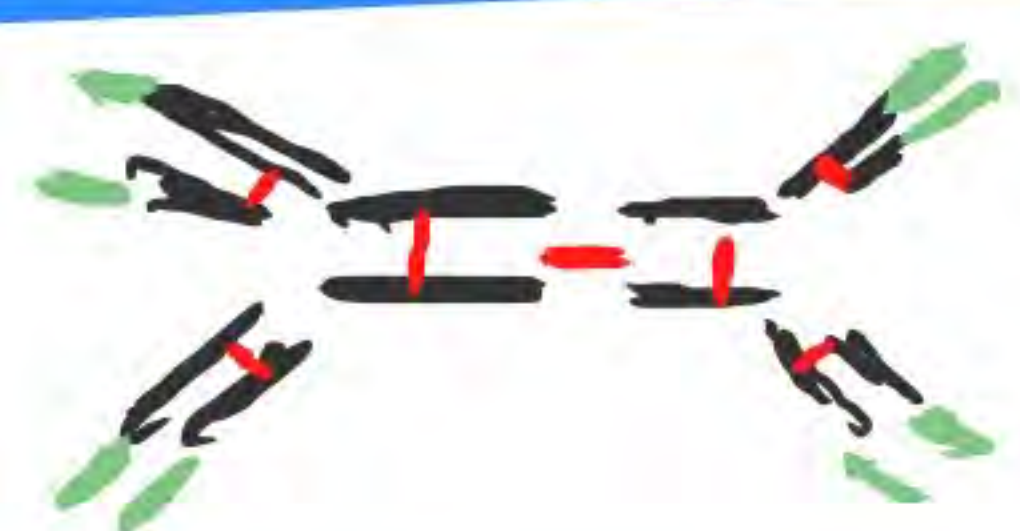


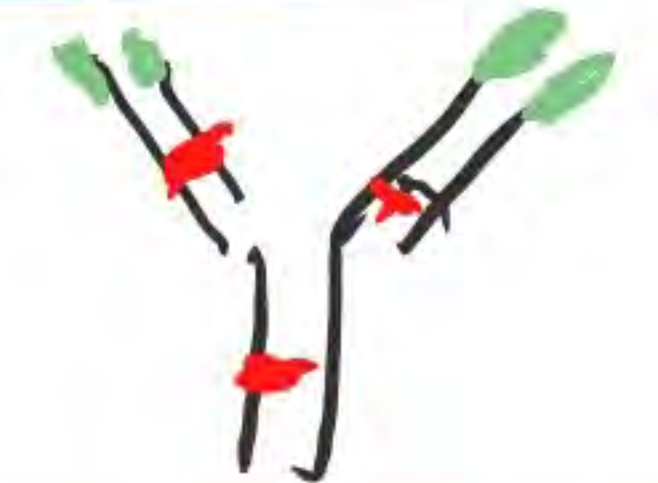


- After initially binding an antigen to the B cell receptor (BCR), a B cell internalizes the antigen and presents it on MHC II. A helper T cell recognizes the MHC II–antigen complex and activates the B cell. As a result, memory B cells and plasma cells are made.

Ig = Immunoglobulins

* lot of \neq functions

* All composed of light chain / heavy chain = Y shape

NAME	PROPERTIES	STRUCTURE
Ig A	Found in mucus, saliva, tears, and breast milk. Protect against pathogens	
Ig D	Part of the B cell receptor. Activates basophils and mast cells	
Ig E	Protect against parasitic worms. Responsible for allergic reactions.	
Ig G	Secreted by plasma cell in the blood. Able to cross the placenta into the fetus	
Ig M	On surface of B-cell or circulating in blood. Responsible of "early" stages of immunity	