

Class 9:

(lymphocytes)

T

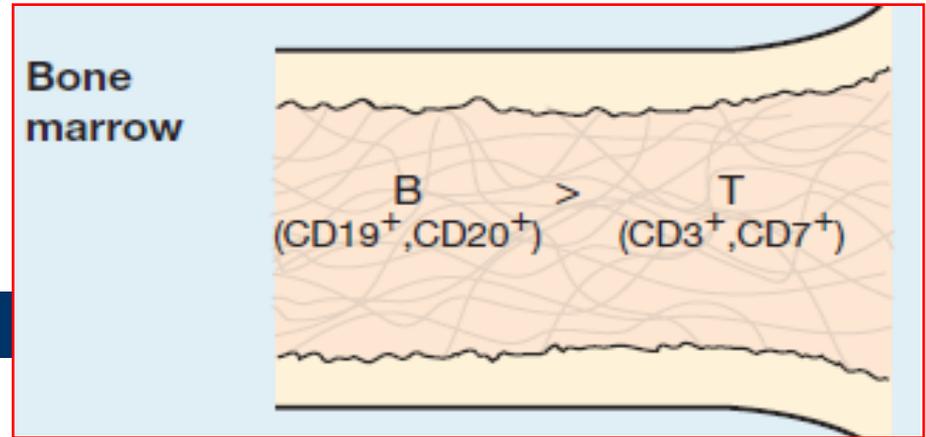
Objectives for this lecture

- Discuss the structure and functions of White blood cells (lymphocytes).
- understand the disorders in lymphocytes.

White blood cells *(lymphocytes)*

- immunologically cells that assist phagocytes in defence.
- *generate :*
 - antigenic specificity
 - immunological memory
- *Lymphoid organs:*
 - bone marrow
 - thymus
 - lymph nodes
 - spleen

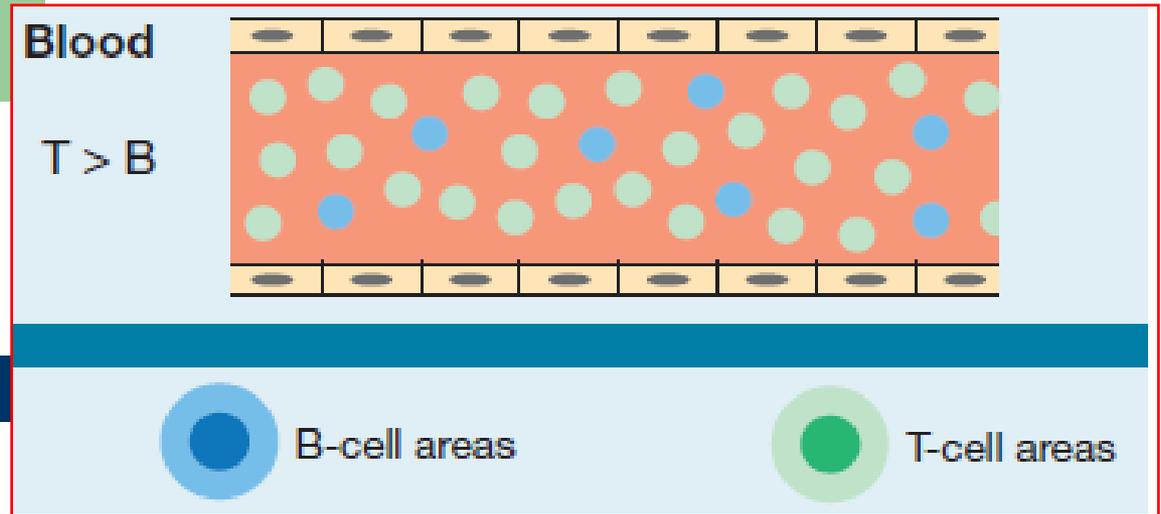
Lymphocytes



- ***B lymphocytes***

- mature in the **bone marrow**
- then circulate in blood and recognize antigen.
- B-cell receptor (BCR) is membrane-bound immunoglobulin binds to a specific antigen (*generation of antibodies*).
- This active phosphoinositide 3-kinase (PI3K).
- Which induce expression of AKT, an anti-apoptotic pro-survival kinase.

- The receptor is secreted as free soluble *immunoglobulin*.
- The B cell then matures into a *memory B cell*.



- ***T lymphocytes***

- from cells that have migrated to the **thymus**.
- During this, T specific cells are selected.
- They recognize antigen when it is presented at a cell surface (*T-cell help for antibody production*).
- In blood they are 80% of lymphocytes.

- ***Natural killer cells***

- Large cytotoxic CD8+ cells.
- Kill target cells that have a low level or absent of (human leucocyte antigen) HLA class, which occur during viral infection or on a malignant cell.

Immunoglobulins

- proteins produced by plasma cells and B lymphocytes.
- bind to antigen.
- *Five subclasses or isotypes:*
immunoglobulin G (IgG), IgA, IgM, IgD and IgE.

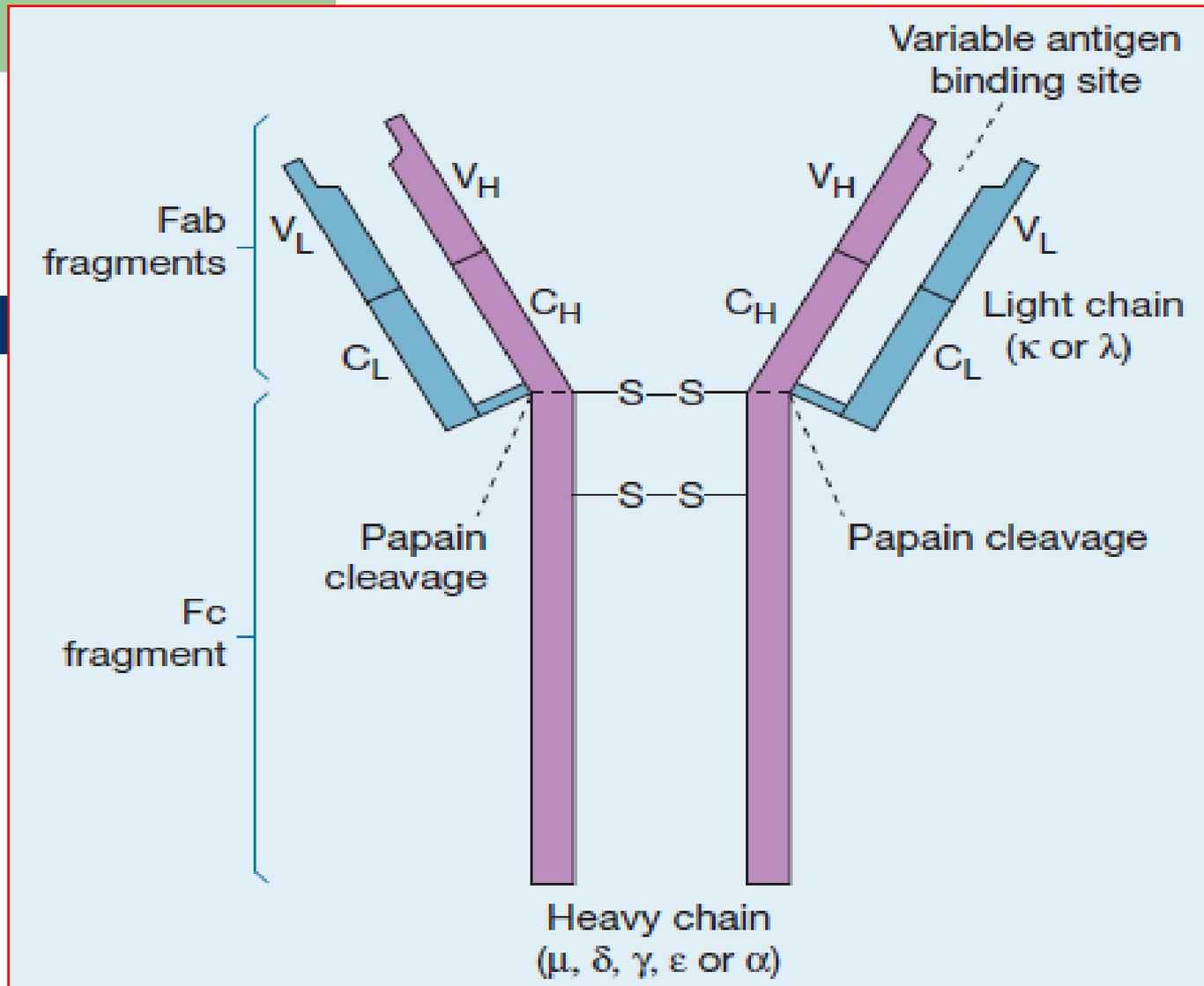


Figure 9.5 Basic structure of an immunoglobulin molecule.

Immunodeficiency

- deficits in components of the immune system.
- *Lack of T cells* (as in AIDS) leads to bacterial, viral, protozoal, fungal and mycobacterial infections.
- *failure of B-cell development*, cause agammaglobulinaemia.

References

- Victor A Hoffbrand, Paul Moss, J Pettit; ***Essential Haematology***. Essentials Series Blackwell Science, New York; 2008.
- Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. ***Harper's Illustrated Biochemistry***. McGraw-Hill Ed, 31 ed, 2018.