



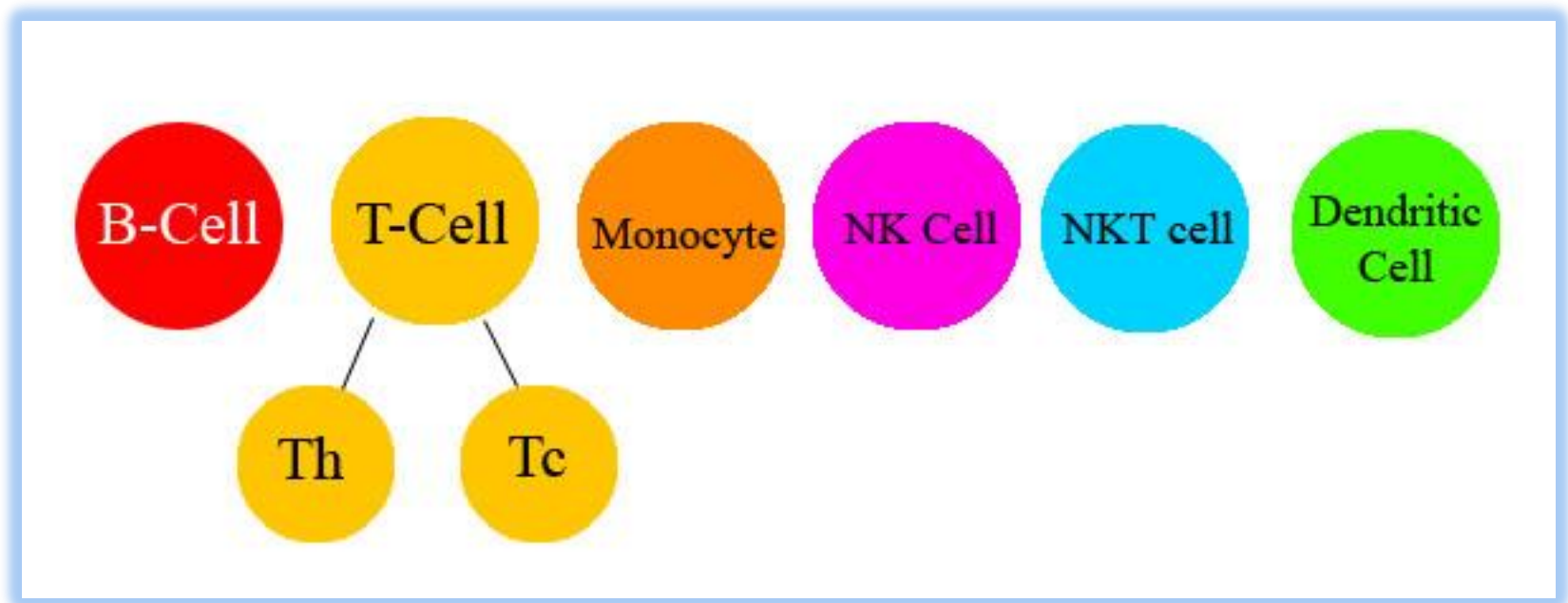
“Cell surface Markers”

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Zeena Hisham

The main Immune cells are



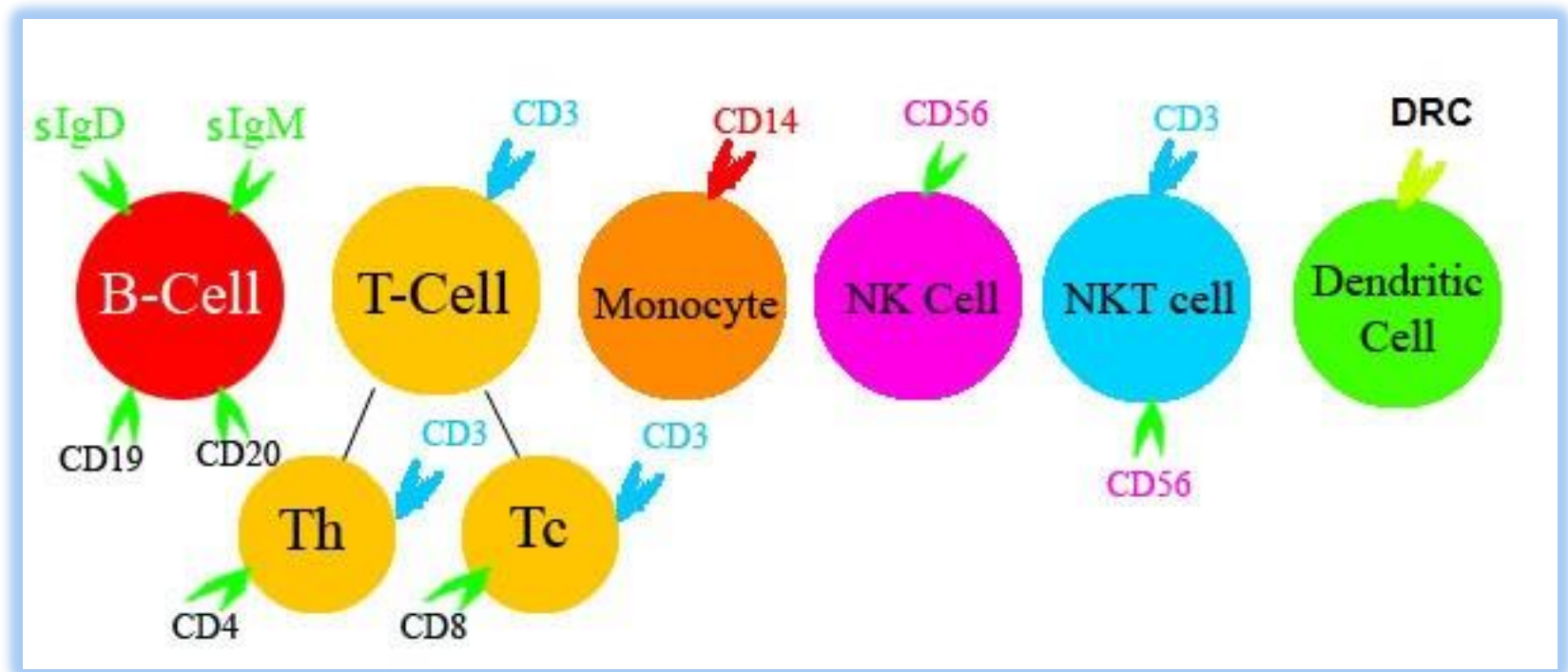
How these cells can be differentiated from each other?

What are cell surface markers?

- Cell markers serve as a sign to help identify and classify cells.
- The majority are molecules or antigens within the plasma membrane of cells.
- Specific combinations of markers are unique to different cell types.
- These molecules are not merely markers, but also have important functional roles.
- Knowing which molecules are present can help in the diagnosis of disease or in directing treatment.

**Usually given the designation of (CD) which means: cluster of designation or differentiation together with appropriate number
e.g. CD19, CD3, CD4**

Cell markers of main immune cells





Sura Muyasser

Techniques used for identifying cell surface markers

- ❖ Immuno-histochemistry
- ❖ Flowcytometry
- ❖ ELISA
- ❖ Western blot

Immuno-histochemistry

- Used for the staining of cell markers
- Applied to identify the distribution of antigens in tissues
- 2 Types

Immuno-fluorescent → **Green** spot (can be seen by fluorescent microscope)

Immuno-enzymatic → (can be seen by visible eye)

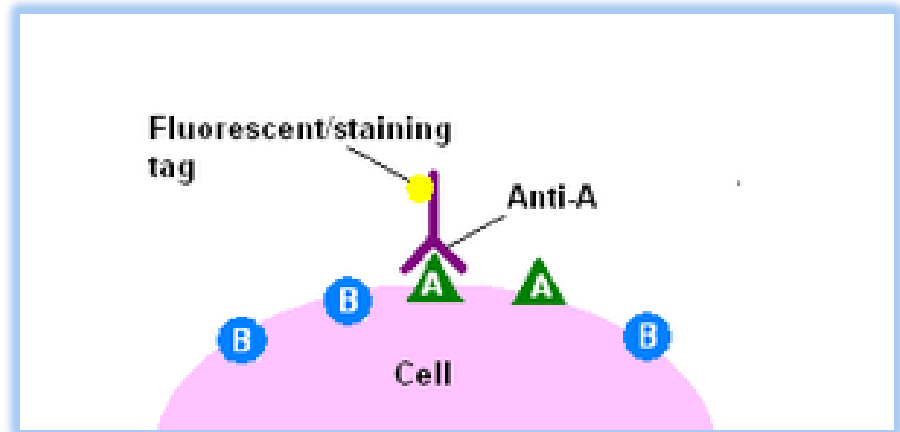
Rhodomine → **Red** spot

Peroxidase → Gray spot

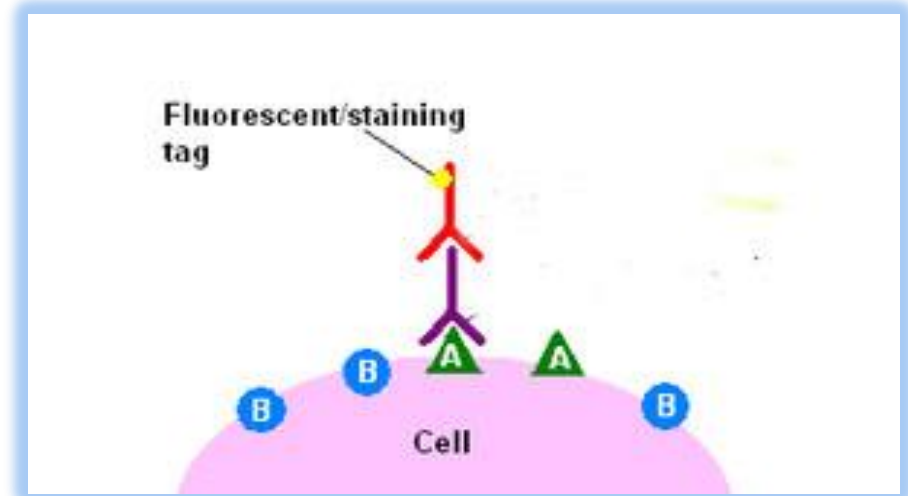
- Involve the addition of specific antibodies (monoclonal Abs) which bind to their Antigens in the tissues, but in order for the reaction to be visible, it should be coloured.

Target antigen detection methods

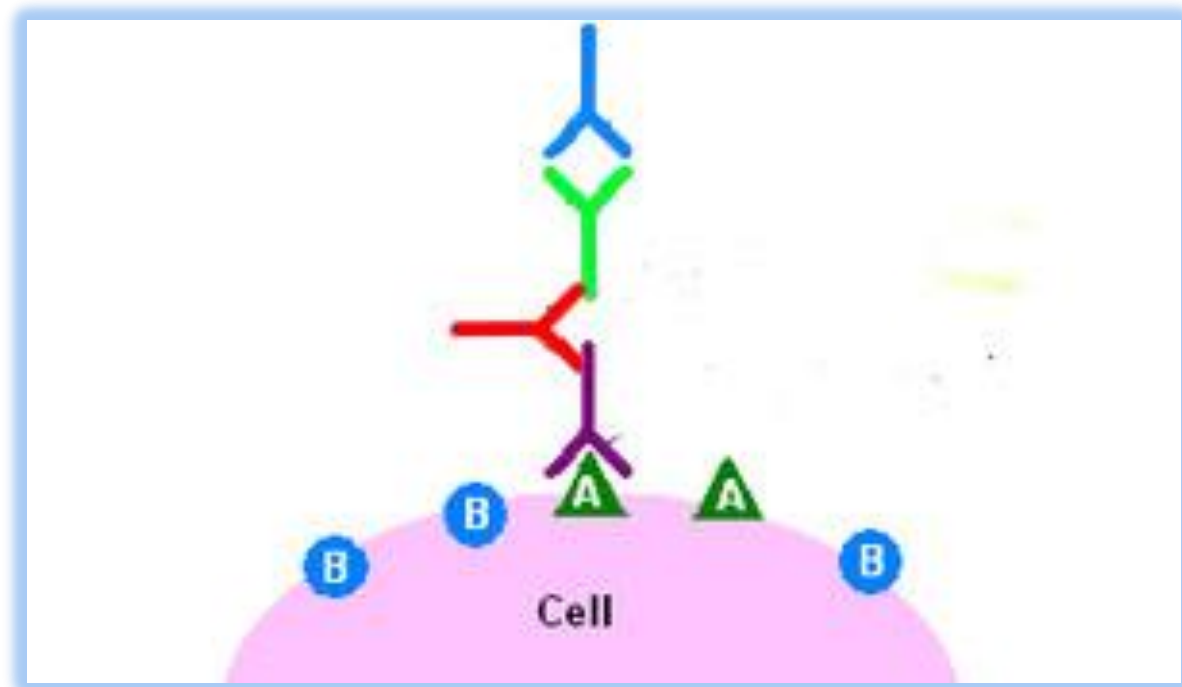
✓ The **direct method** is a one-step staining method and involves a labeled antibody (e.g. FITC-conjugated antiserum) reacting directly with the antigen in tissue sections. While this technique **utilizes only one antibody** and therefore is simple and rapid.



✓ The **indirect method** involves an unlabeled primary antibody (first layer) that binds to the target antigen in the tissue and a labeled secondary antibody (second layer) that reacts with the primary antibody.



Sandwich method





Sarah Salam

Lymphocytes cell markers

Where we can find the Lymphocytes?

➤ Primary lymphoid organs

Bone marrow

Thymus

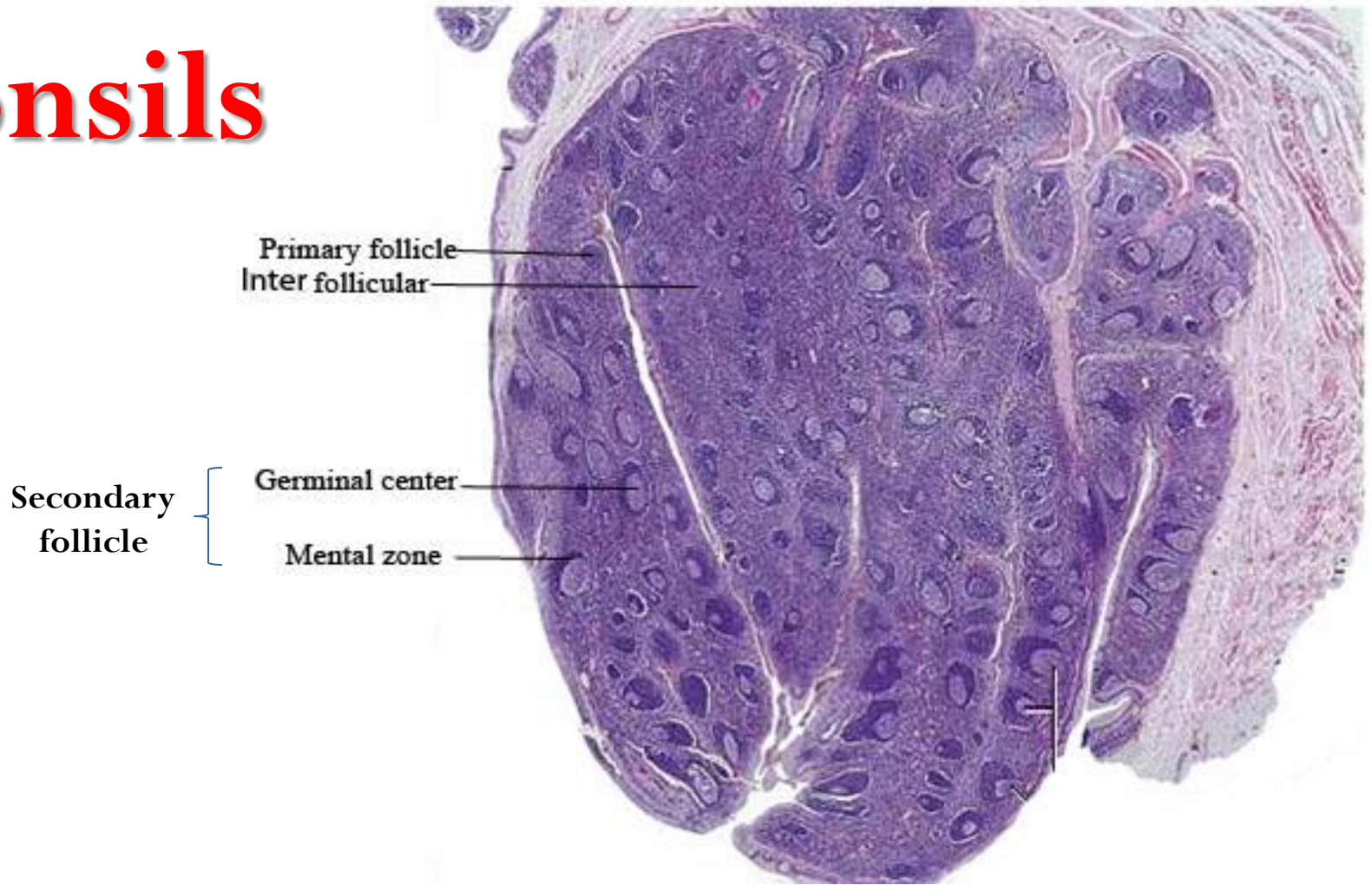
➤ Secondary lymphoid organs

Tonsils

Spleen

Lymph node

Tonsils



- Majority of lymphocytes in the 1ry & 2ry follicles are of **B-Cells**
- Majority of lymphocytes in the Interfollicular are of **T-Cells**
- **Dendritic cells** can be found in the germinal center

B-Cell markers: IgM

➤ 1ry follicles: Many cells are positive

➤ 2ry follicles:
M.Z: many cells are positive

G.C: meshwork staining

➤ IFA: few cells are positive



B-Cell markers: IgD

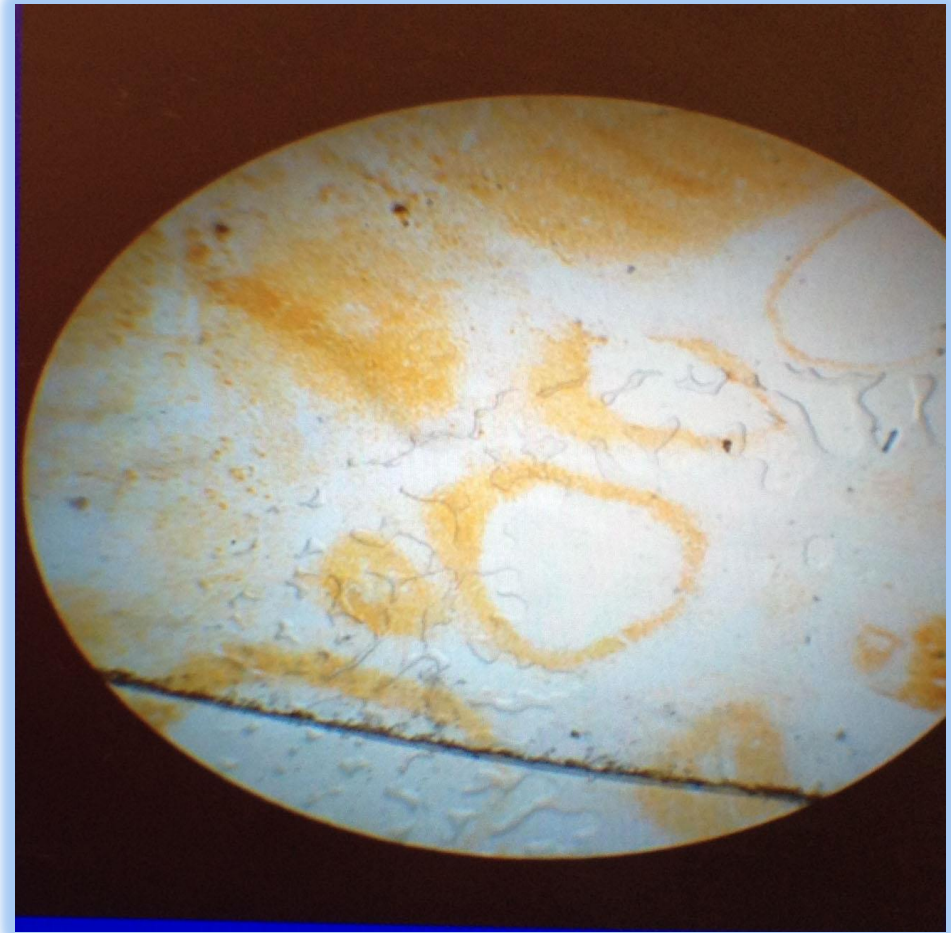
➤ 1ry follicles: Many cells are positive

➤ 2ry follicles:

M.Z: many cells are positive

G.C: few cells are positive

➤ I_HA: few cells are positive



T-Cell markers: CD3 OR CD4

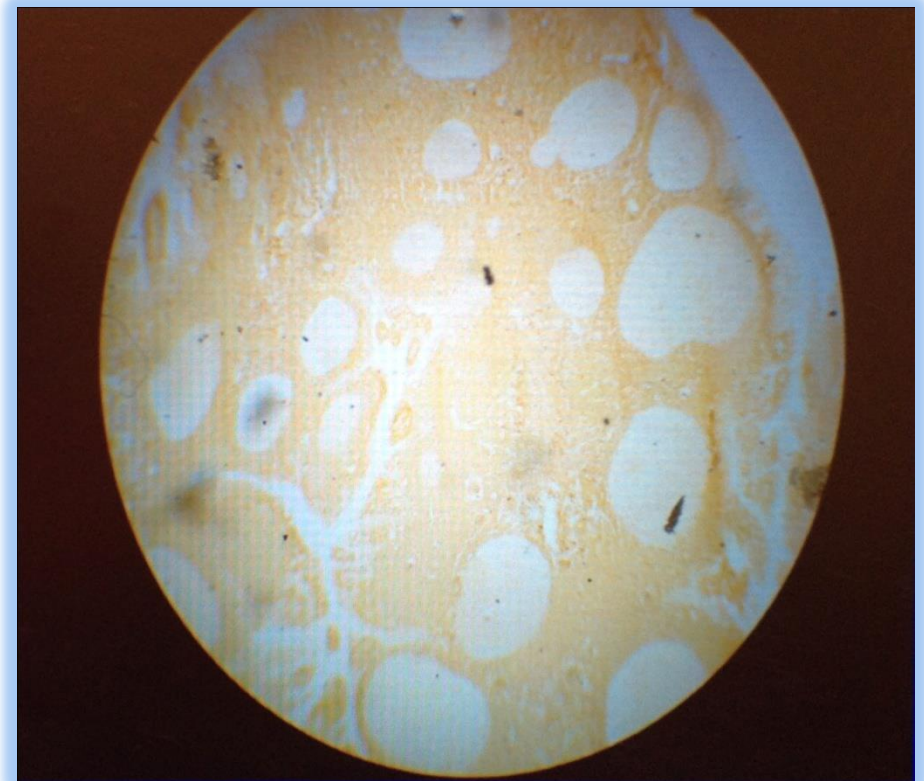
➤ 1ry follicles: Few cells are positive

➤ 2ry follicles:

M.Z: few cells are positive

G.C: few cells are positive

➤ IFA: Majority of cells are positive (2\3 of the cell population)



CD3 cannot be differentiated from CD4 from this slide

T-Cell markers: CD8

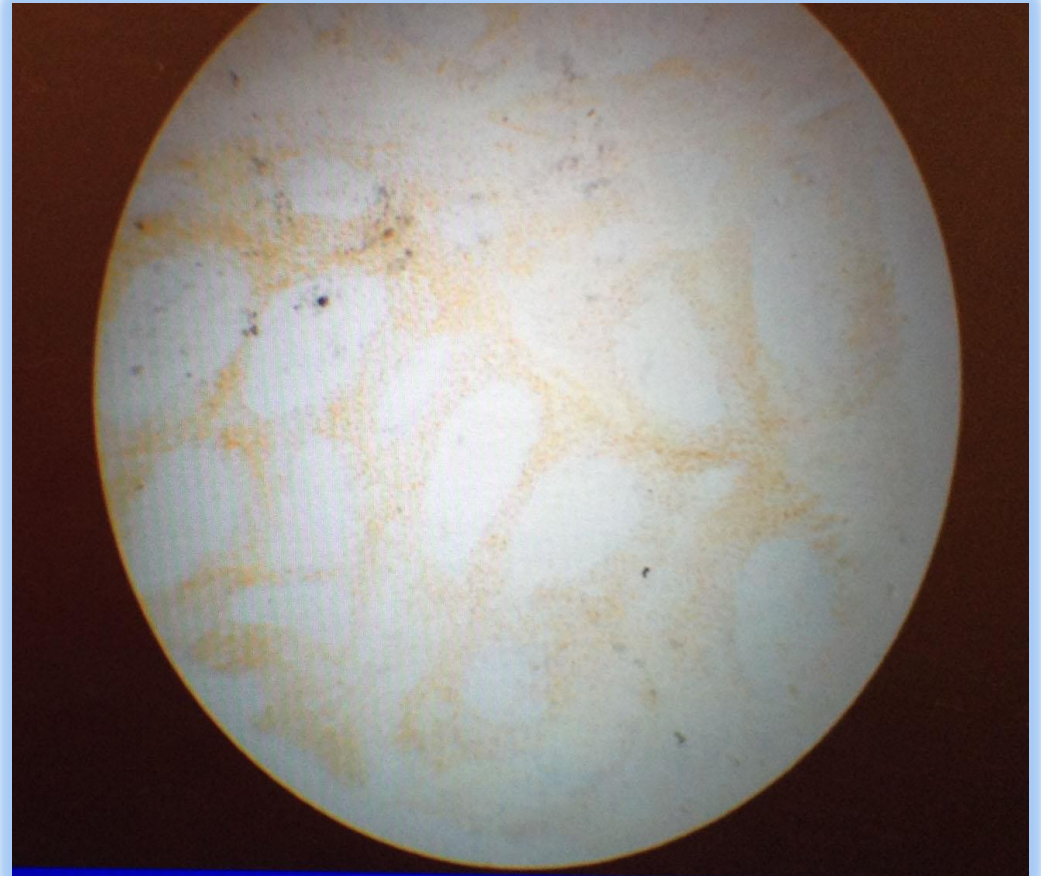
➤ 1ry follicles: Few cells are positive

➤ 2ry follicles:

M.Z: few cells are positive

G.C: few cells are positive

➤ IFA: Majority of cells are positive (1\3 of the cell population)



DRC marker

**Meshwork
staining in
germinal center
of 2ry lymphoid
follicles.**





**Thanks for your
attention**