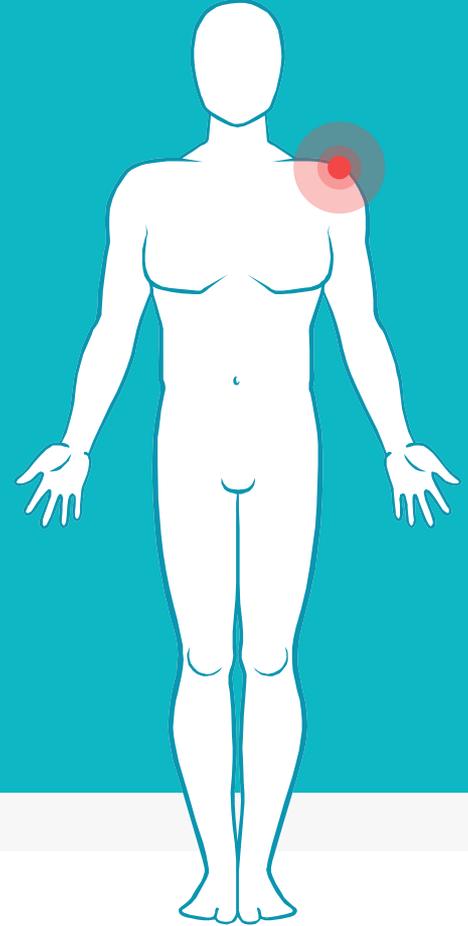
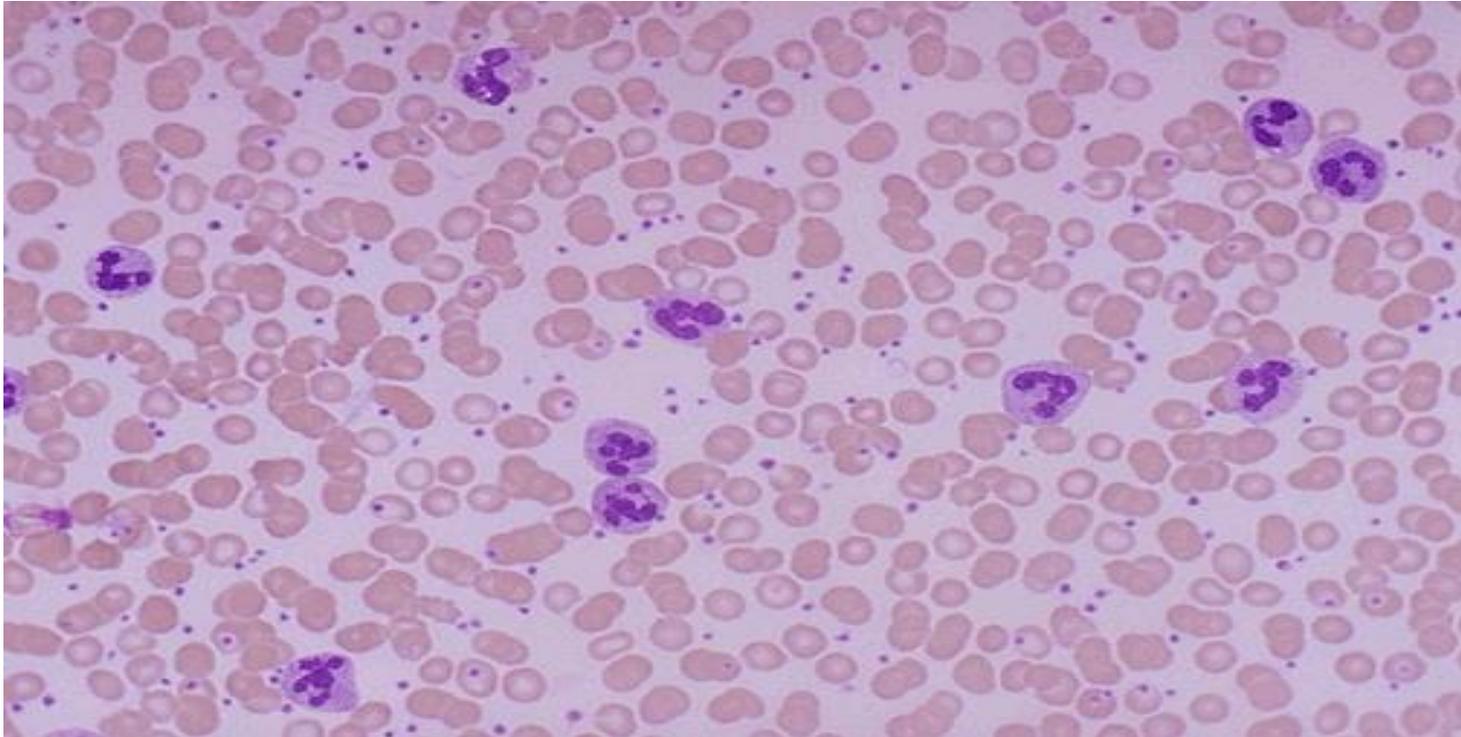


Hematopoietic & Lymphoid System Pathology LAB 2



Ghadeer Hayel, M.D.
Assistant professor of Pathology
Mutah University
Consultant hematopathologist

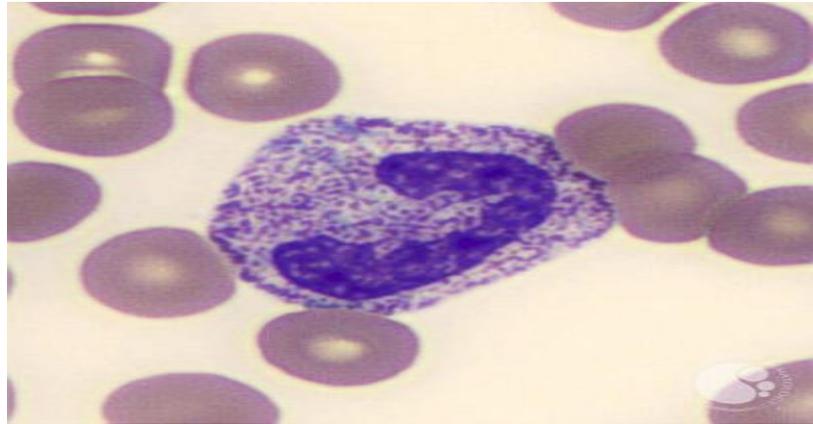
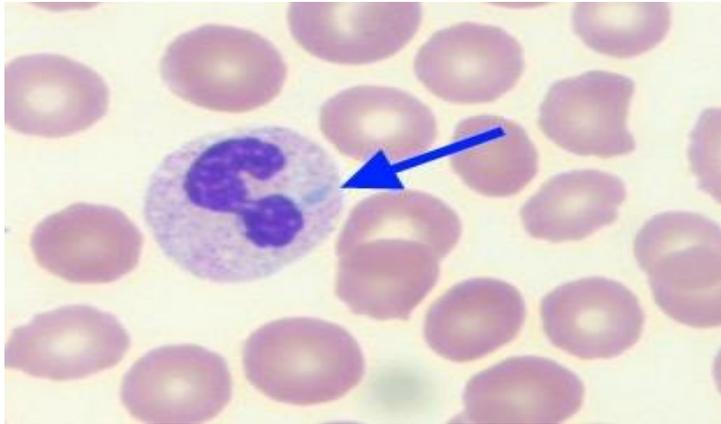
Leukocytosis - neutrophilia



Leukocytosis - neutrophilia

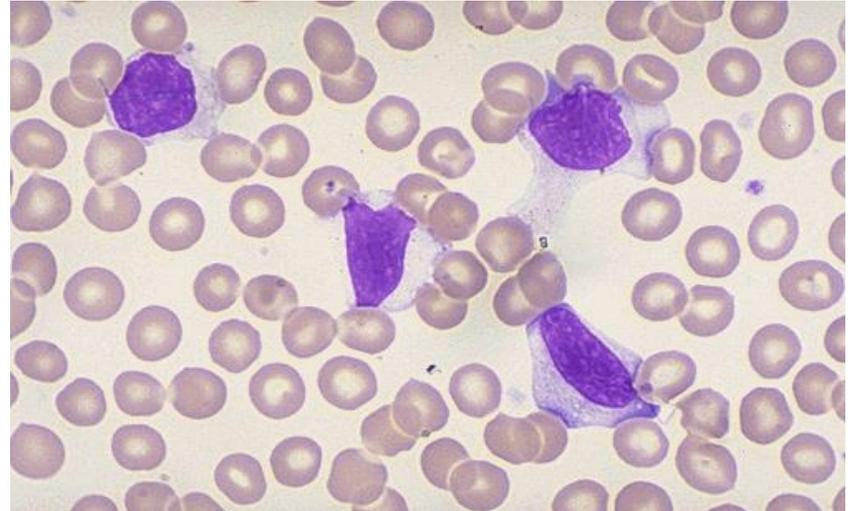
In sepsis or severe inflammation neutrophilia is accompanied by morphologic changes:

- + cytoplasmic vacuoles
- + Toxic granules, coarser & darker than normal granules
- + **Döhle bodies**: patches of dilated ER (appear → sky-blue cytoplasmic “puddles.”)



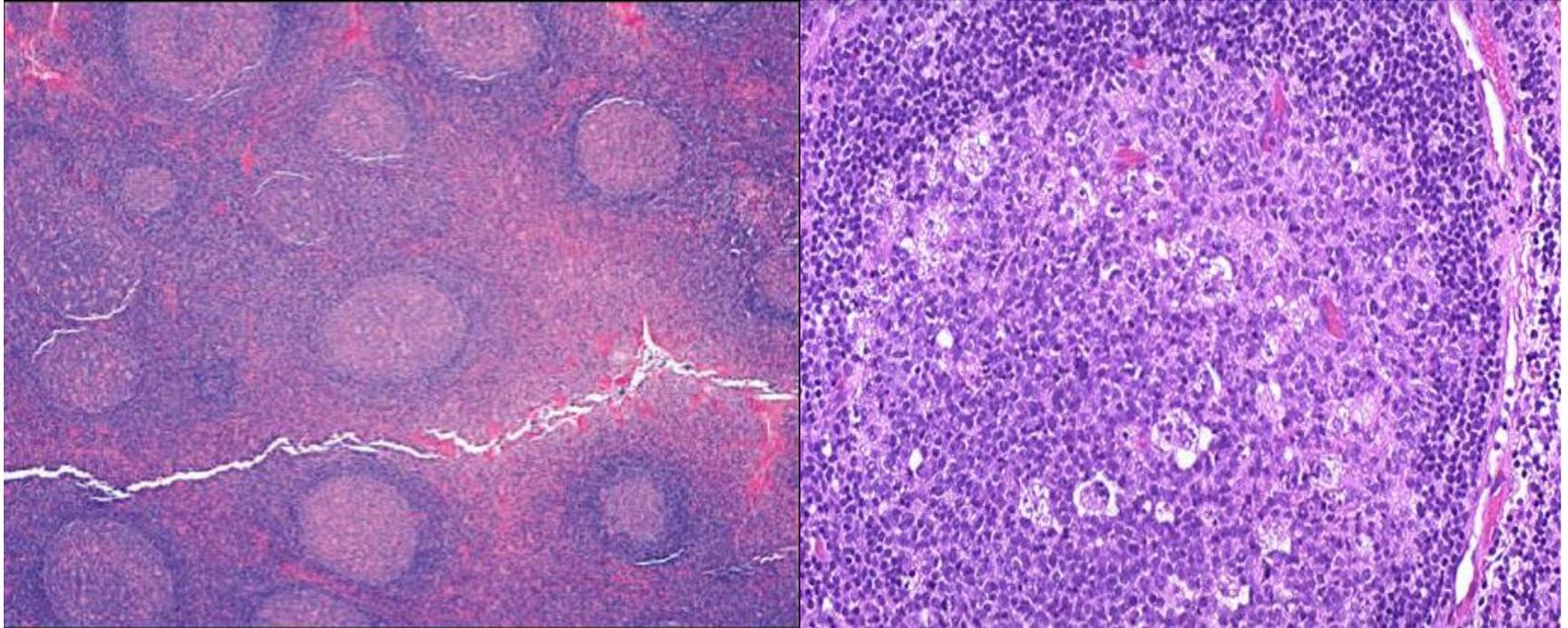
Infectious mononucleosis

- ▶ More than half of these cells are large atypical lymphocytes (activated CD8+ T cells) with an oval, indented, or folded nucleus & abundant cytoplasm & a few azurophilic granules



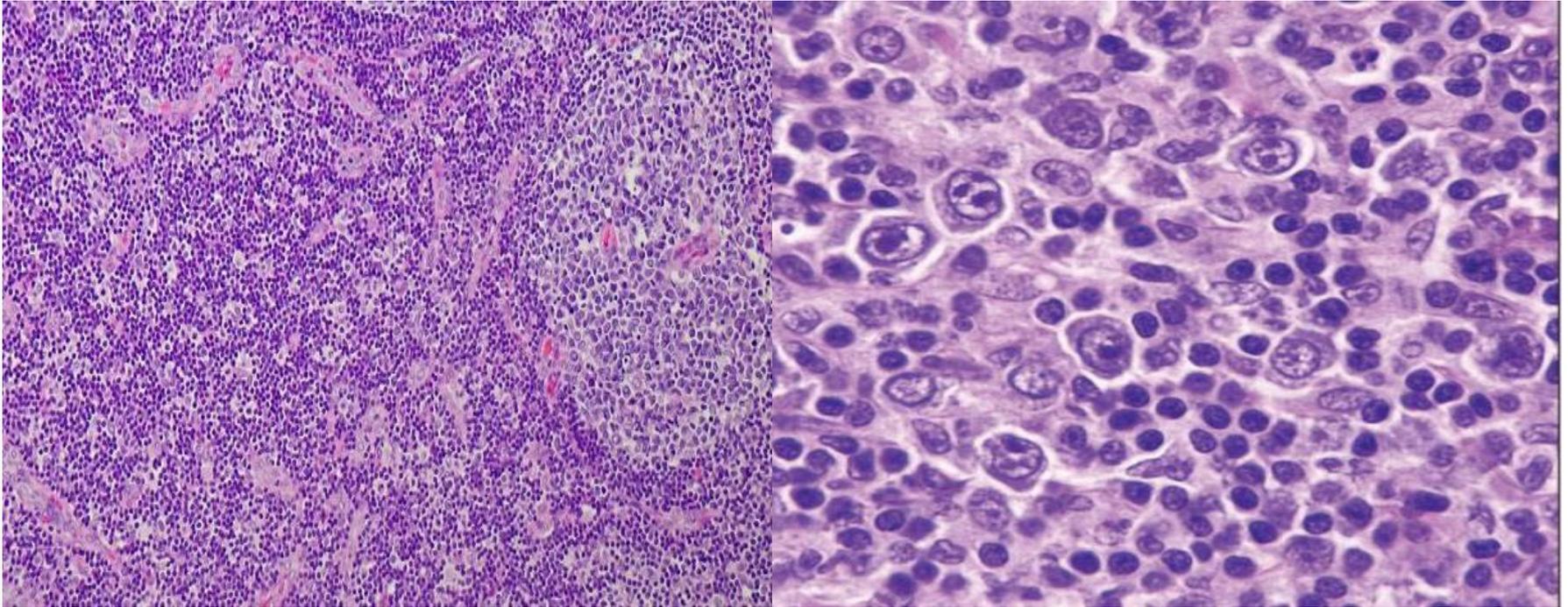
Reactive Lymphadenitis

Chronic Nonspecific Lymphadenitis - Follicular hyperplasia.



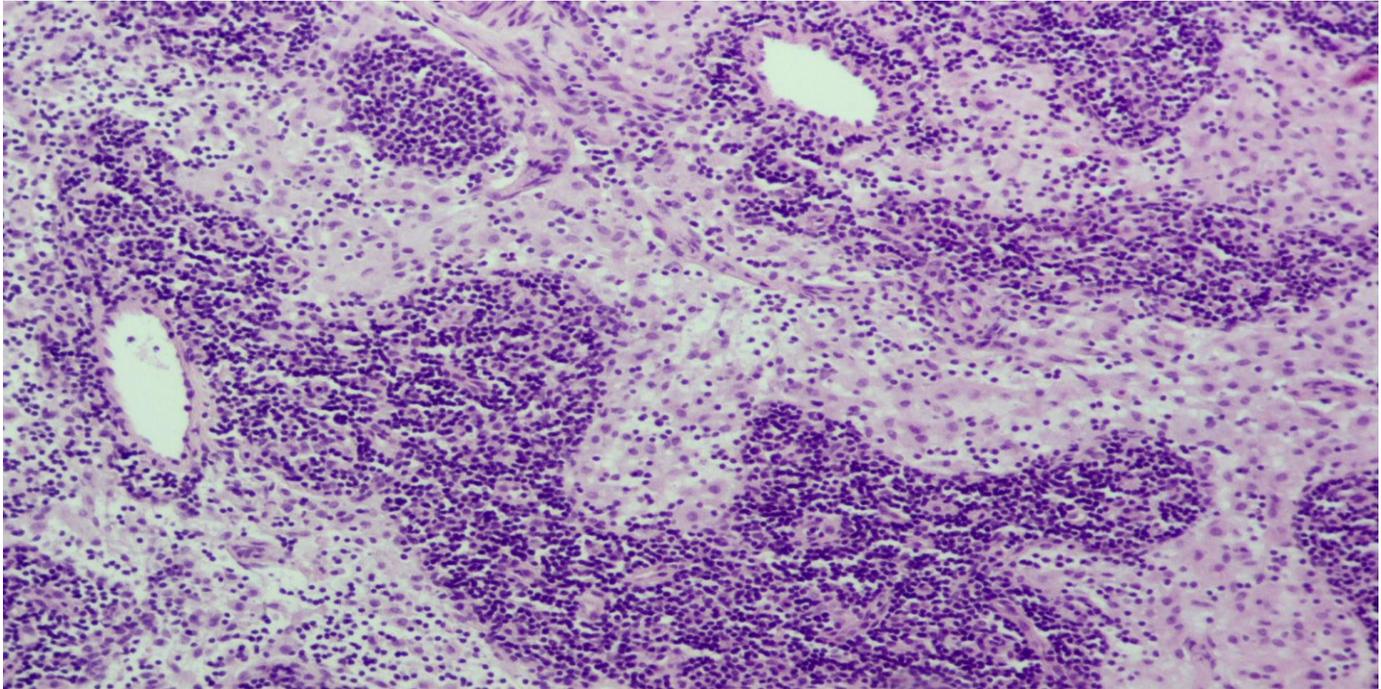
Reactive Lymphadenitis

Chronic Nonspecific Lymphadenitis - Paracortical hyperplasia

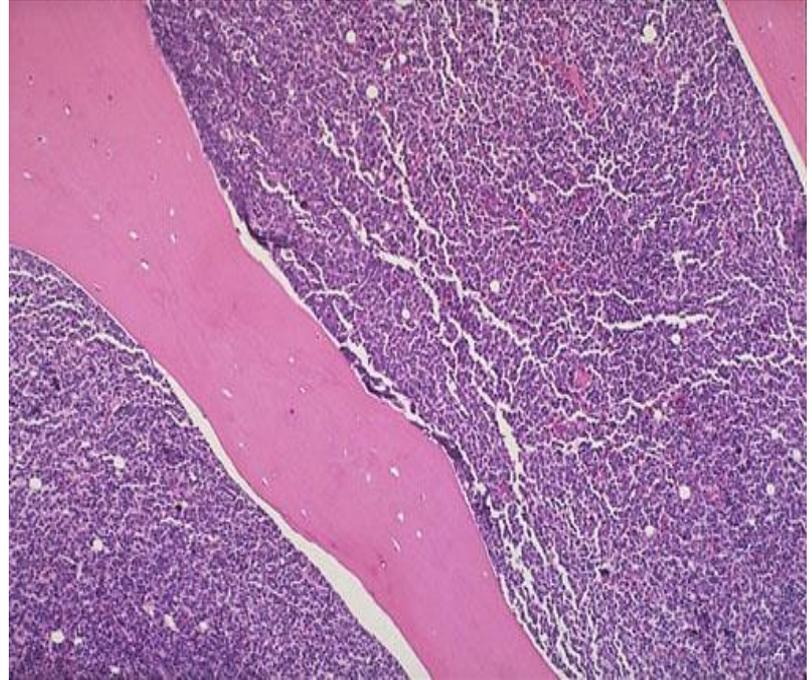
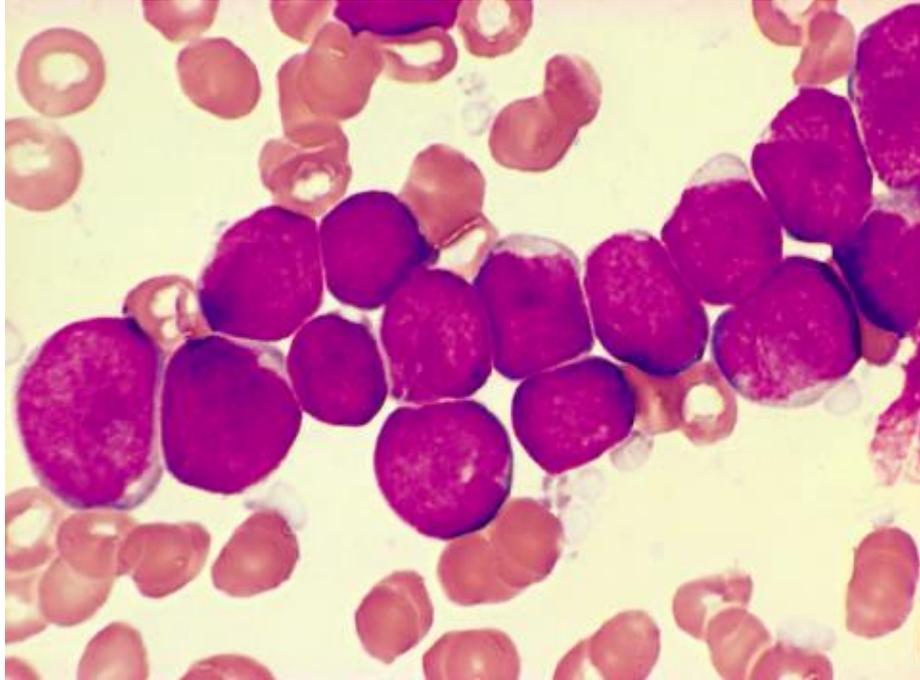


Reactive Lymphadenitis

Chronic Nonspecific Lymphadenitis - Sinus Histiocytosis

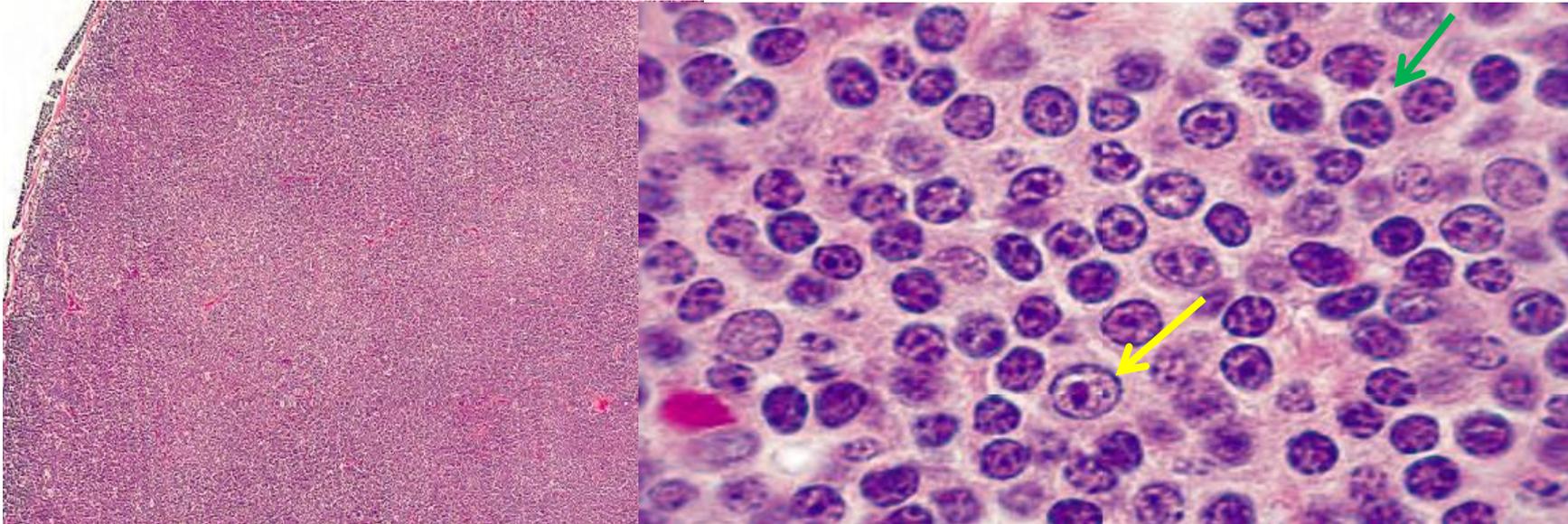


Acute Lymphoblastic Leukemia/Lymphoma (ALL) : Morphology



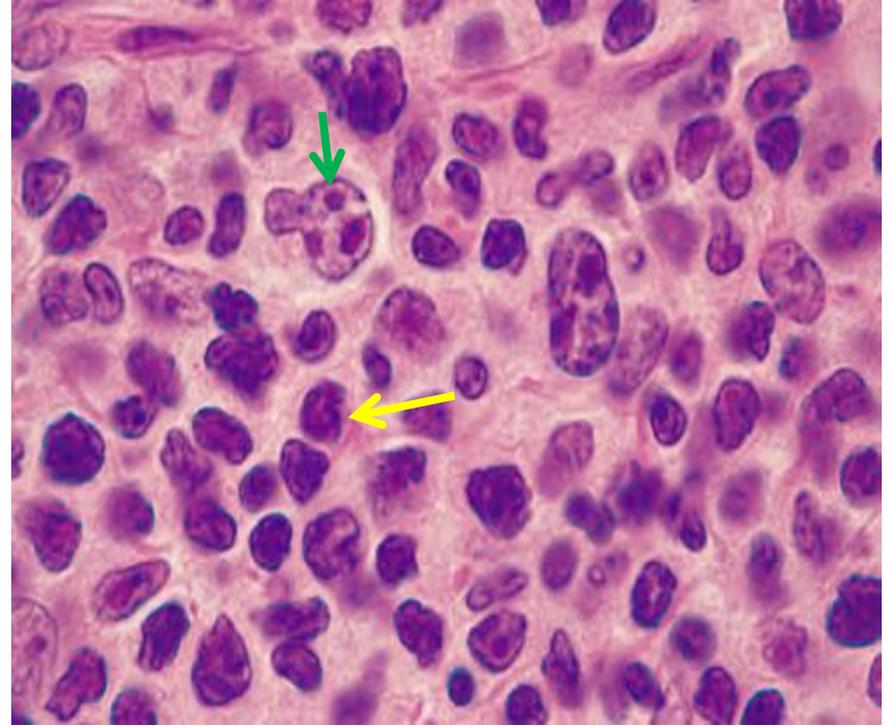
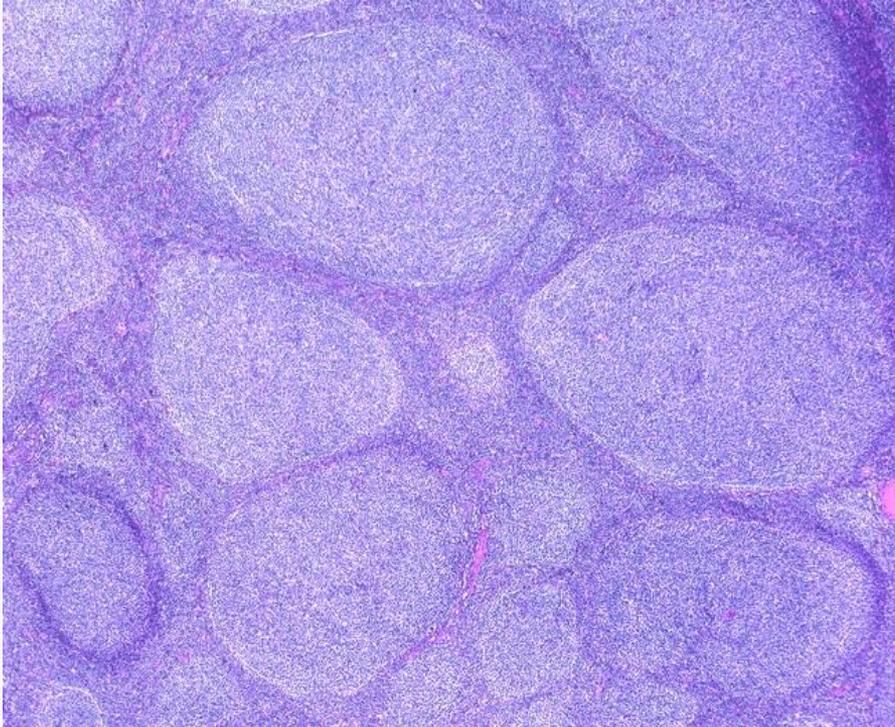
Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL) : Morphology

Green arrow: cells w Clumped chromatin & white areas in between conferring a “soccer ball” appearance. **Yellow** arrow : prolymphocytes

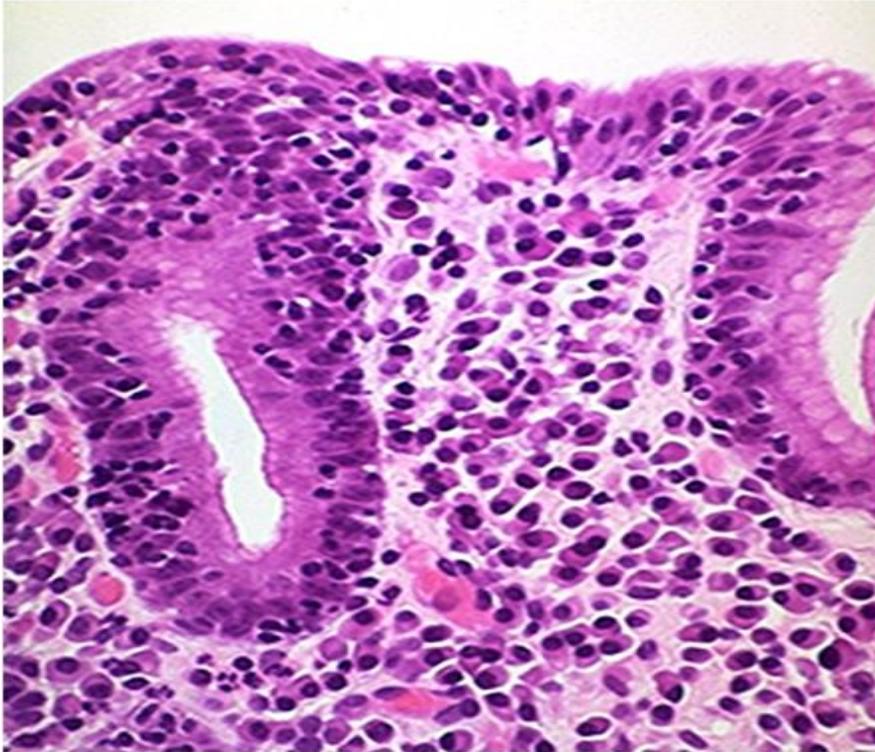


Follicular Lymphoma - Morphology

Centrocyte
centroblast



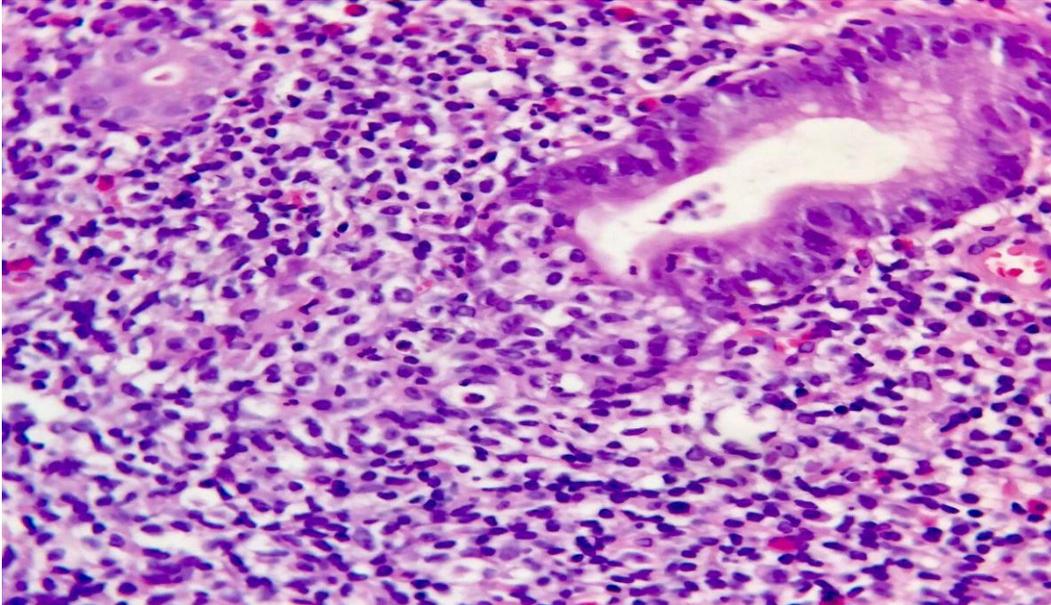
Extranodal Marginal Zone Lymphoma - morphology



showing intraepithelial atypical lymphocytes (lymphoepithelial lesion) and plasma cell differentiation in the lamina propria.

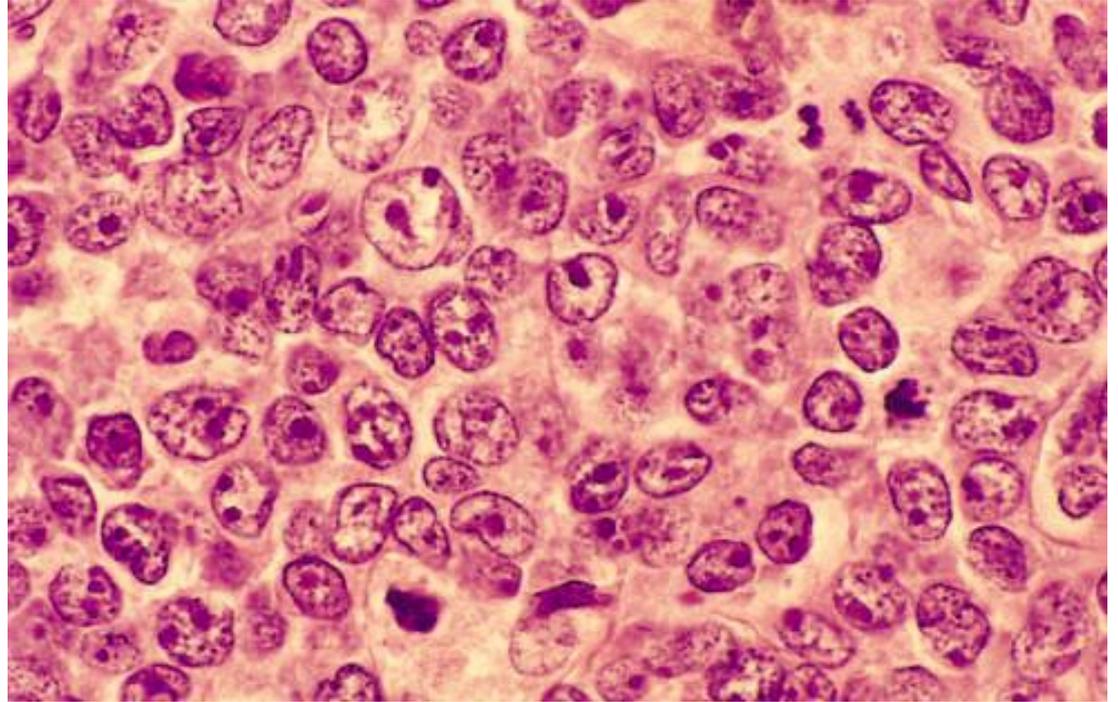
Extranodal Marginal Zone Lymphoma - morphology

tumor cells accumulate abundant pale cytoplasm
(lymphoepithelial lesion)

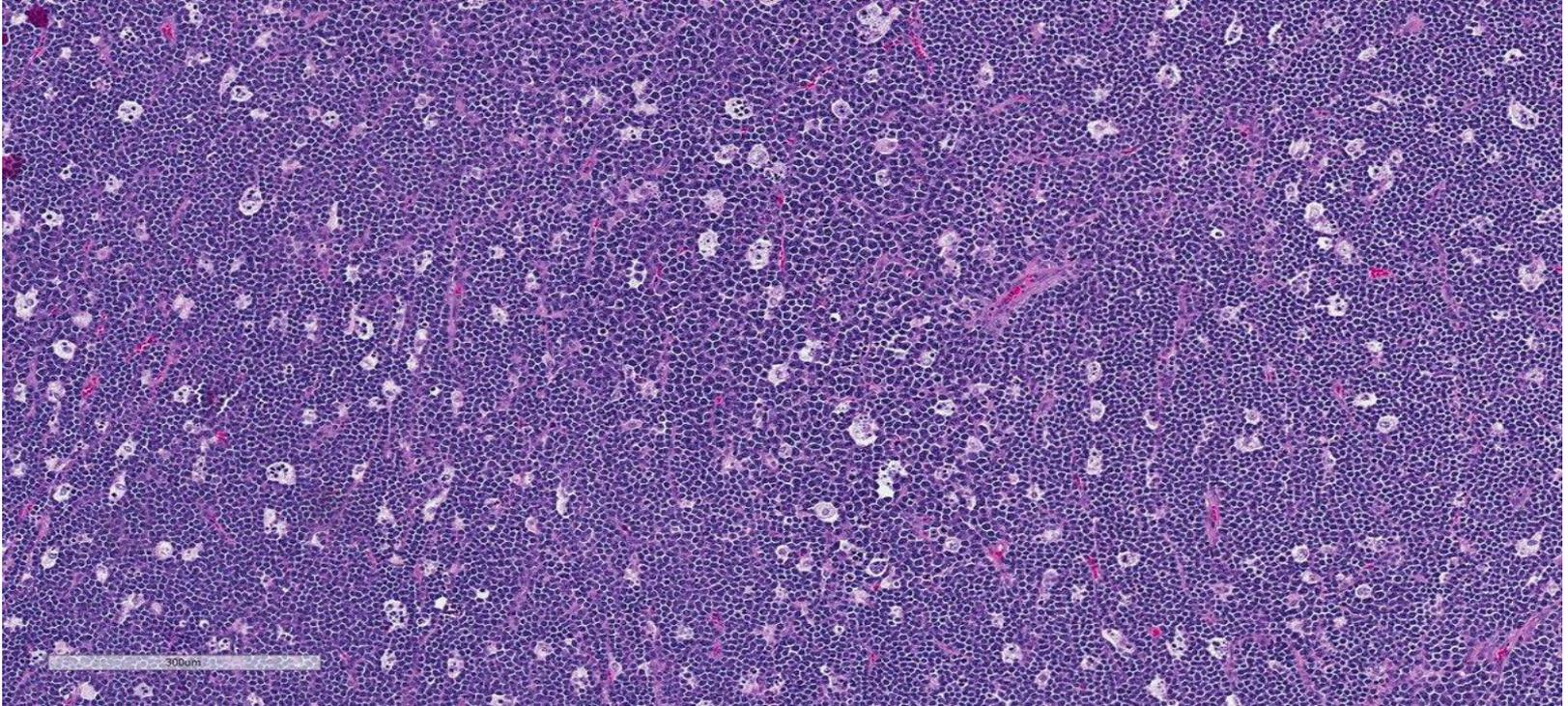


Diffuse Large B Cell Lymphoma - Morphology

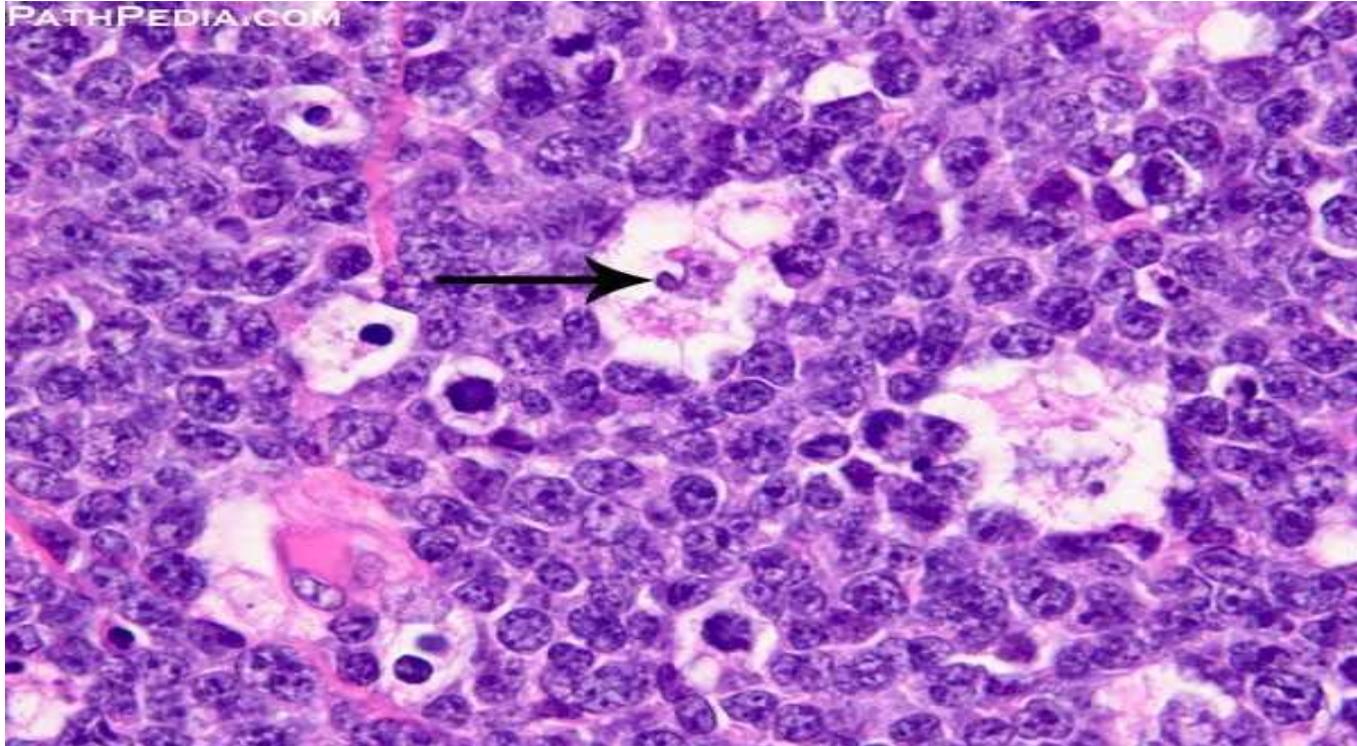
Diffuse infiltration by large neoplastic B cells (three to four times the size of resting lymphocytes) & vary in appearance.



Burkitt Lymphoma – Morphology – starry sky

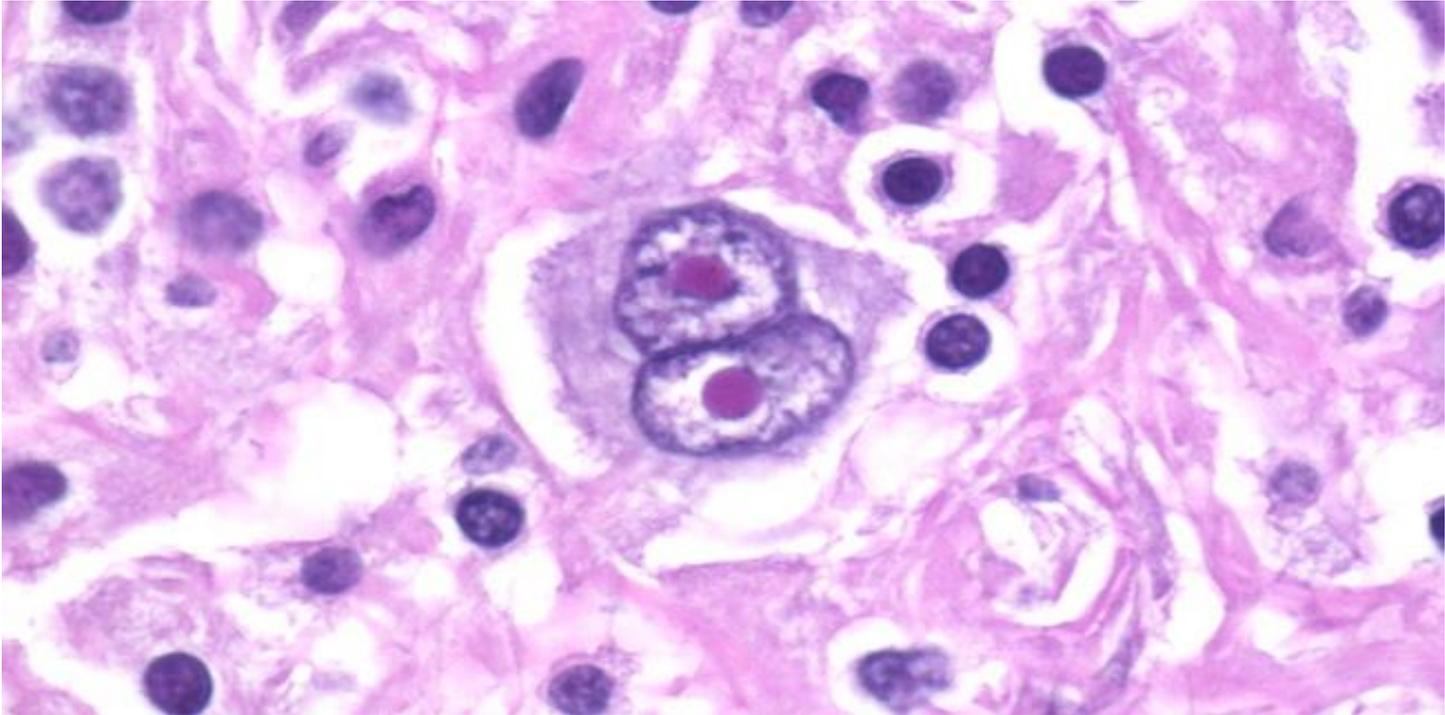


Burkitt Lymphoma – tingible body macrophages



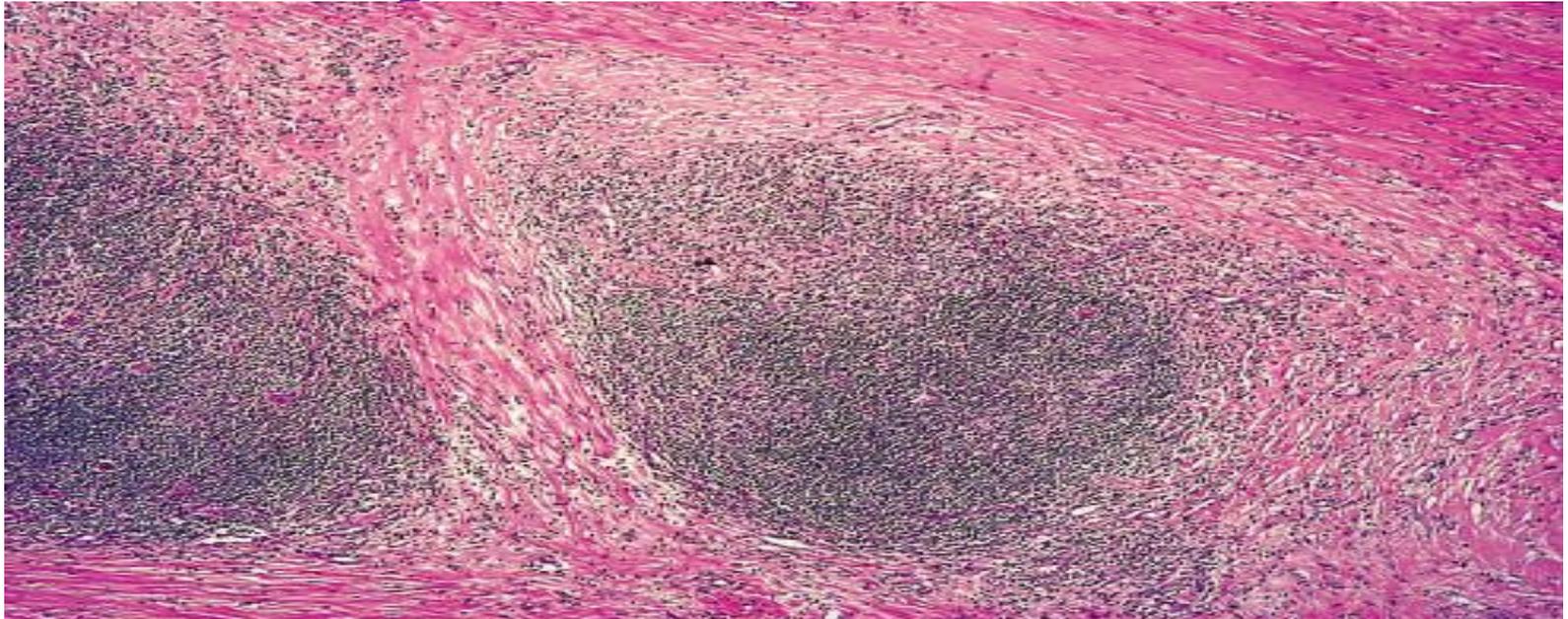
Hodgkin Lymphoma – morphology

owl-eye appearance of RS cells



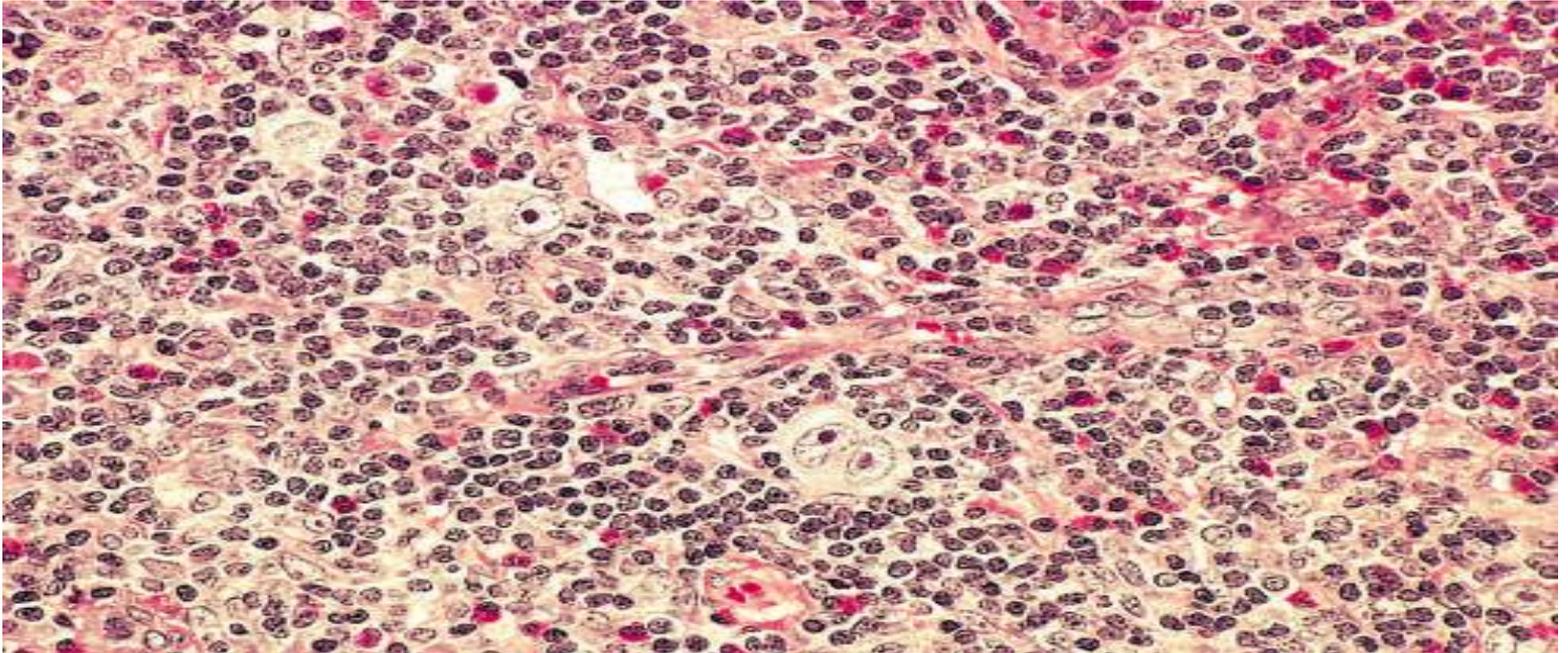
Hodgkin Lymphoma – morphology

HL- nodular sclerosis type: well-defined bands of pink, acellular collagen that divide the tumor cells in nodules..



Hodgkin Lymphoma – morphology

HL- mixed-cellularity type: RS cell surrounded by eosinophils, lymphocytes, and histiocytes.



Mycosis Fungoides and Sézary Syndrome -morphology

Patch



Plaque

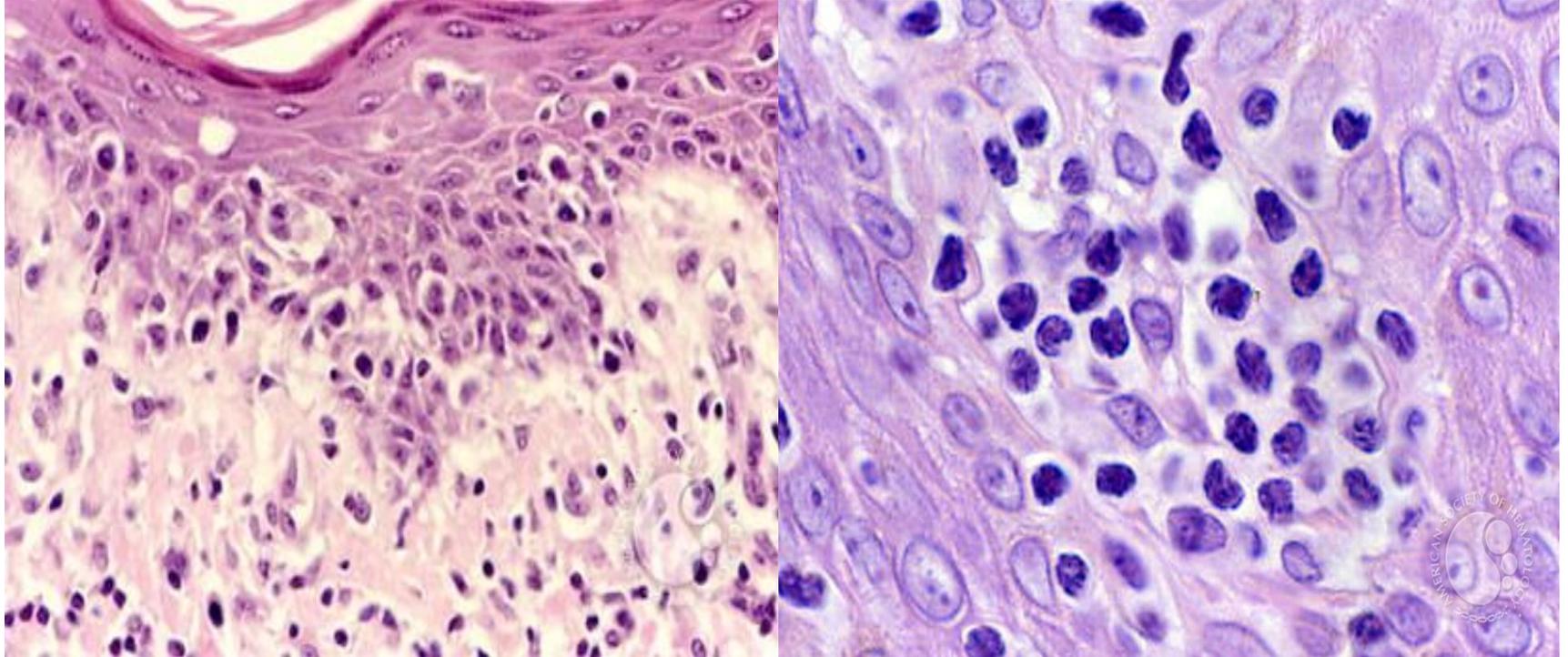


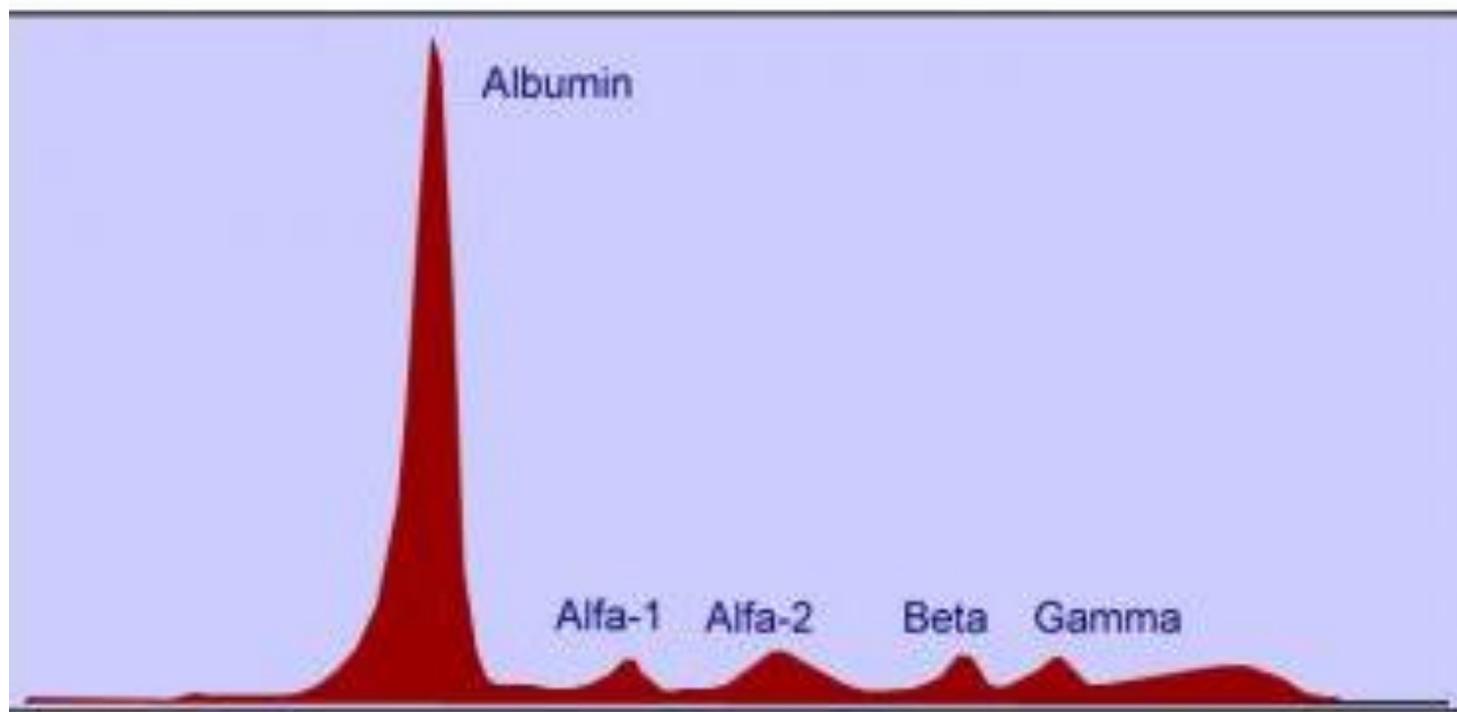
Tumor



Erythroderma

Mycosis Fungoides and Sézary Syndrome -morphology

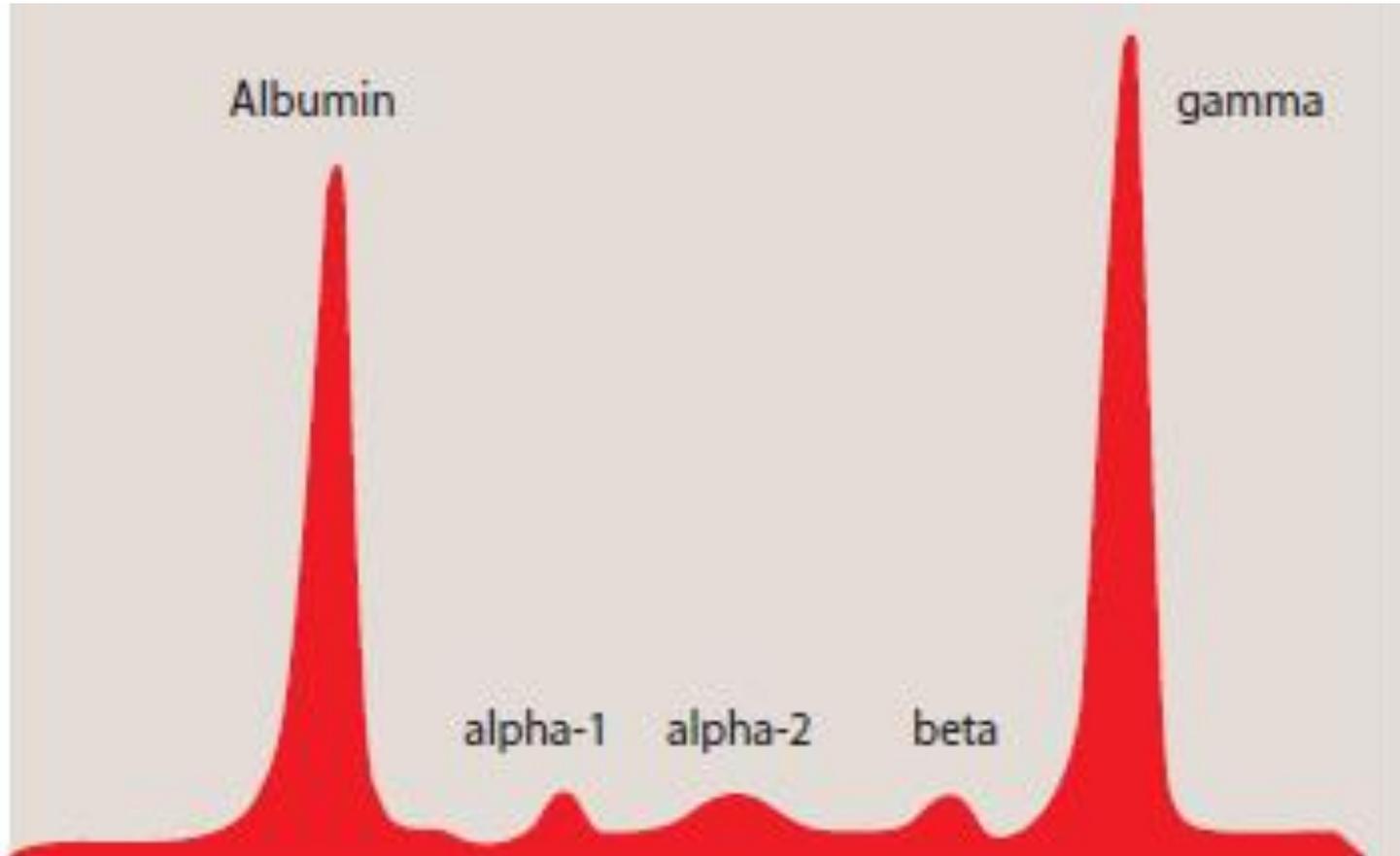




Normal serum protein electrophoresis diagram with legend of different zones

ABNORMAL: MULTIPLE MYELOMA

22



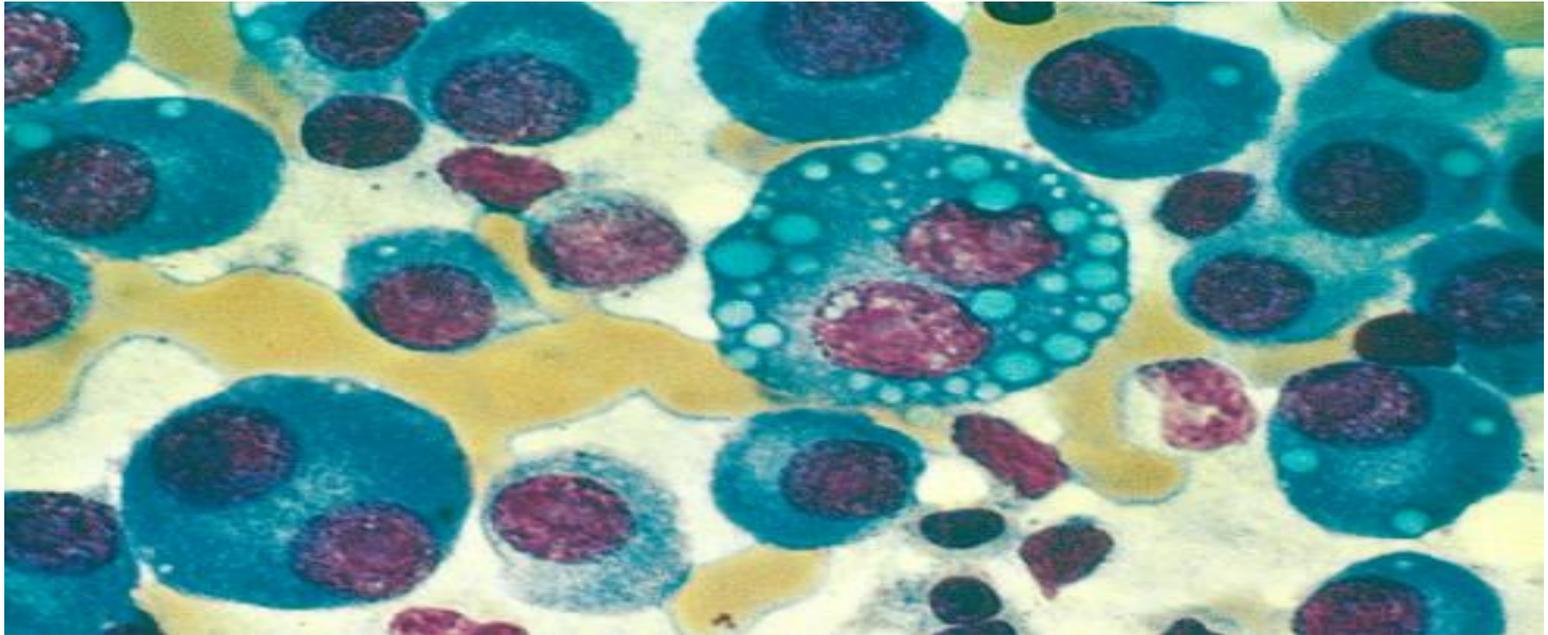
Multiple Myeloma - Morphology

- ▶ Multifocal destructive skeletal lesions mostly involve the vertebral column, ribs, skull,
- ▶ The lesions arise in the **medullary cavity**.
- ▶ Bone destruction leads to **pathologic fractures**.



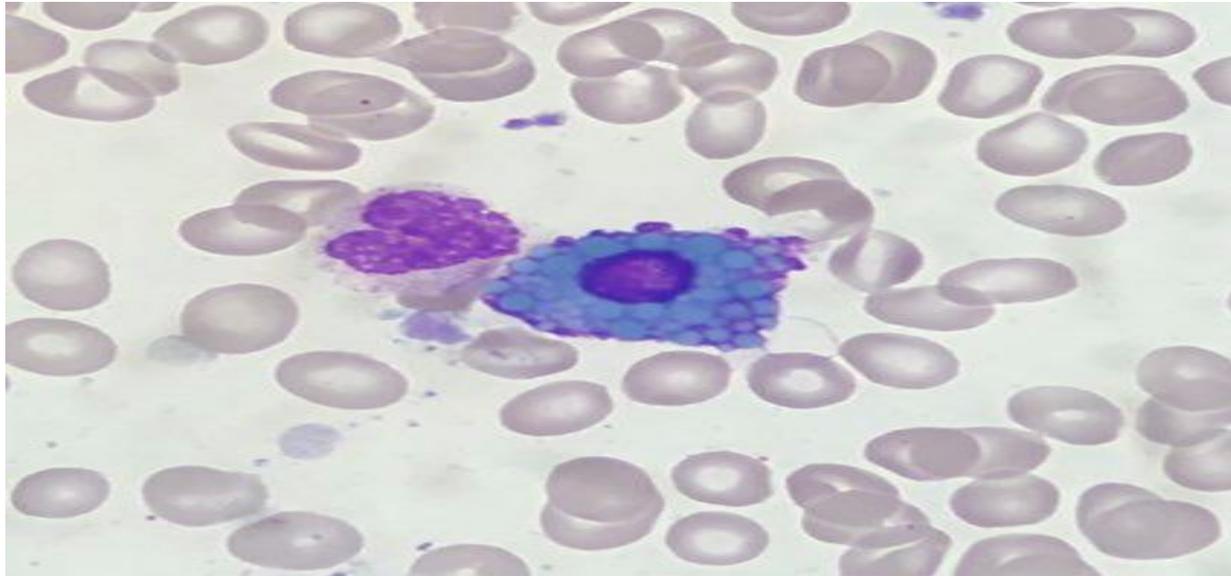
Multiple Myeloma - Morphology

Microscopically: the marrow shows increased numbers of plasma cells, usually $> 30\%$ of the cellularity.



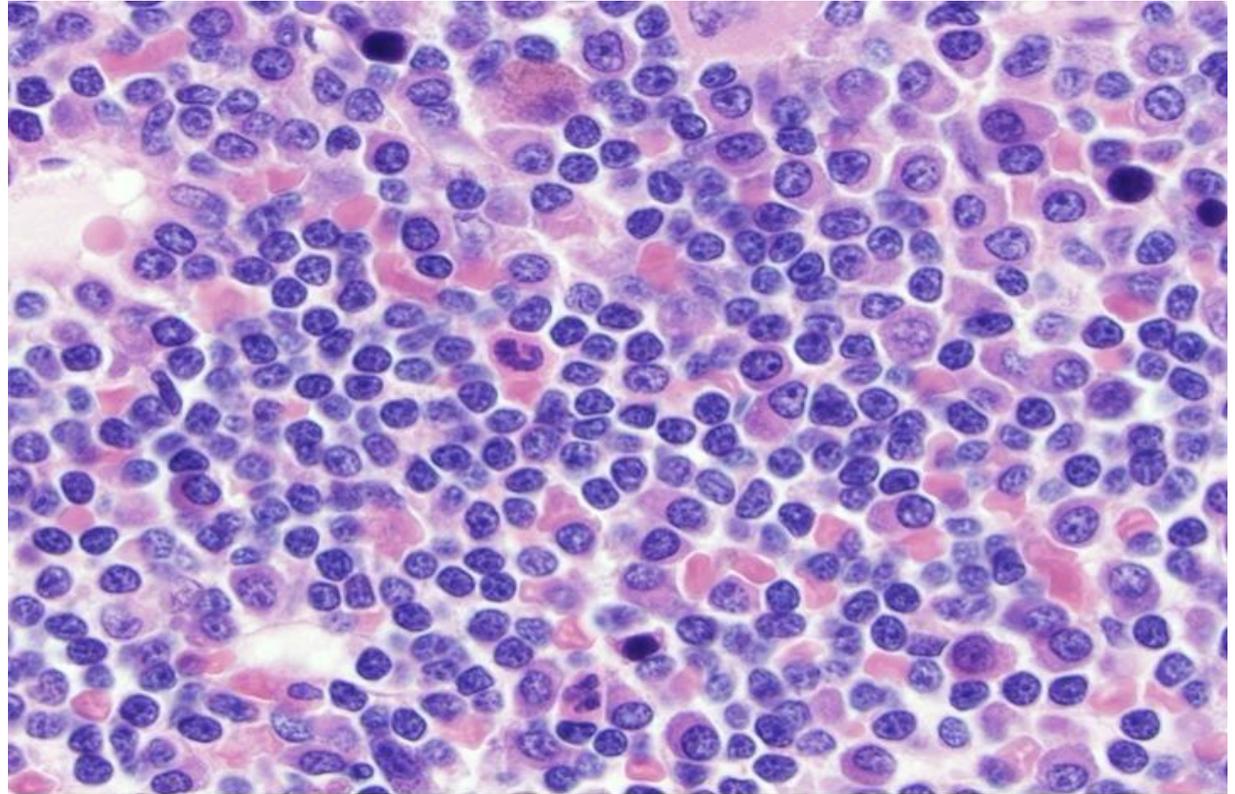
Multiple Myeloma - Morphology

Mott cells are plasma cells that have spherical inclusions packed with Ig in their cytoplasm, **Inclusions: Russell bodies**



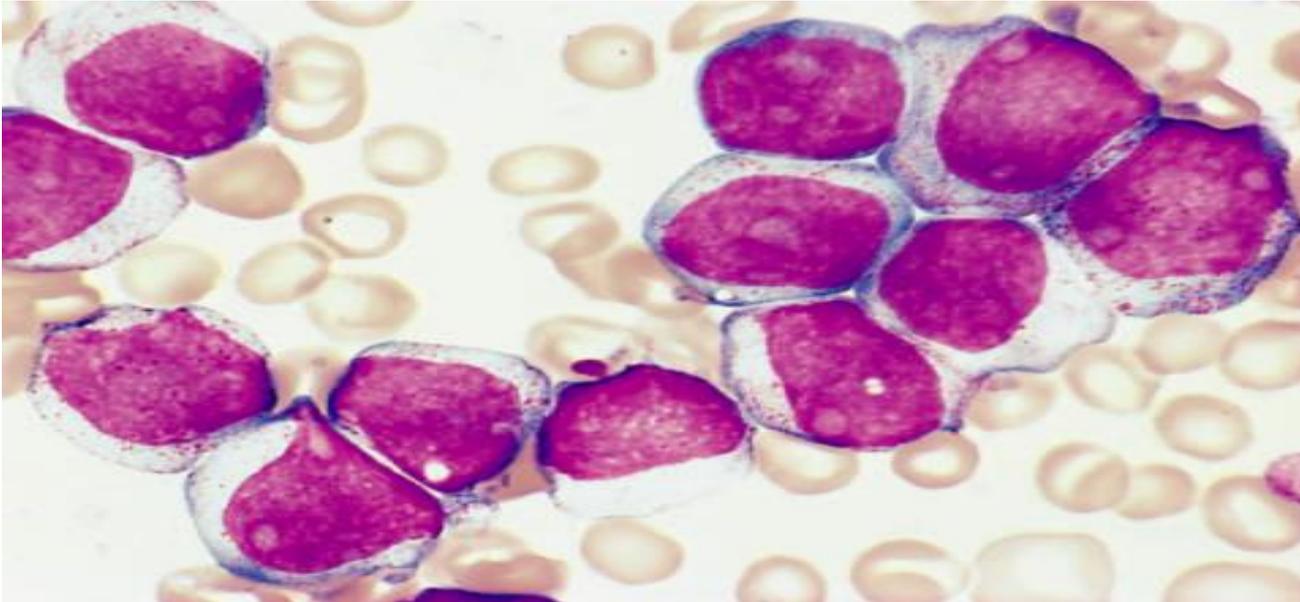
Lymphoplasmacytic Lymphoma - Morphology

The marrow is infiltrated by lymphocytes, plasma cells, & plasmacytoid lymphocytes in varying proportions.



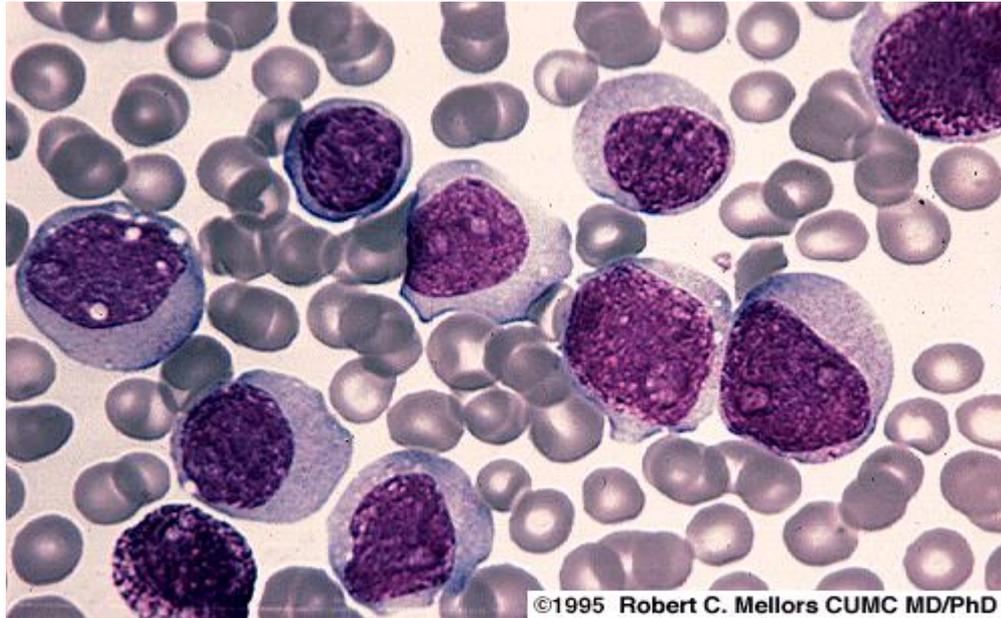
Acute myeloid leukemia (AML) – Morphology

- ▶ at least 20% myeloid blasts or promyelocytes of BM cellularity.



Acute myeloid leukemia (AML) – Morphology

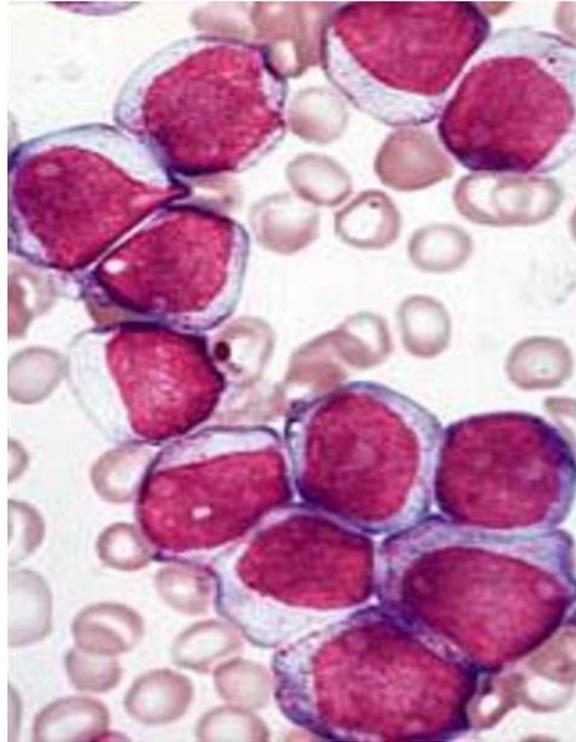
- ▶ at least 20% myeloid blasts or promyelocytes of BM cellularity.



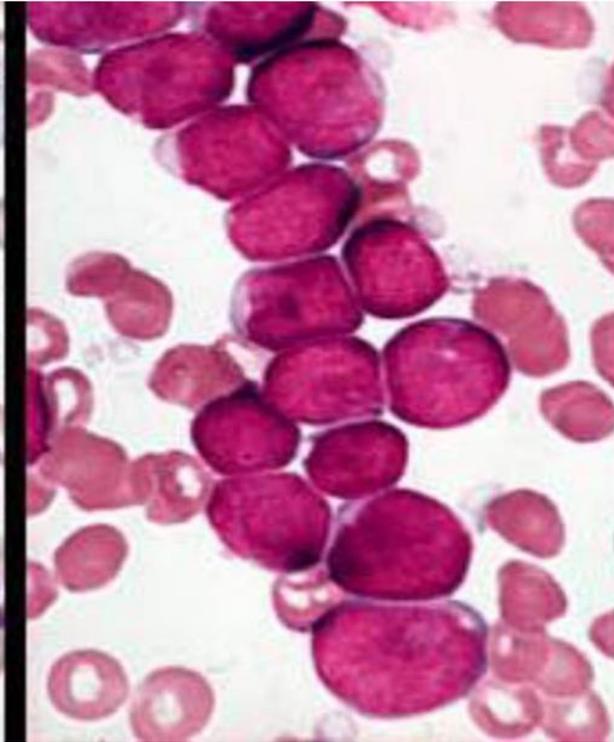
Acute myeloid leukemia (AML) – Morphology

Myeloblasts: have delicate nuclear chromatin, 2-4 nucleoli, larger cytoplasm than lymphoblasts & fine azurophilic cytoplasmic granules.

MYELOBLASTS

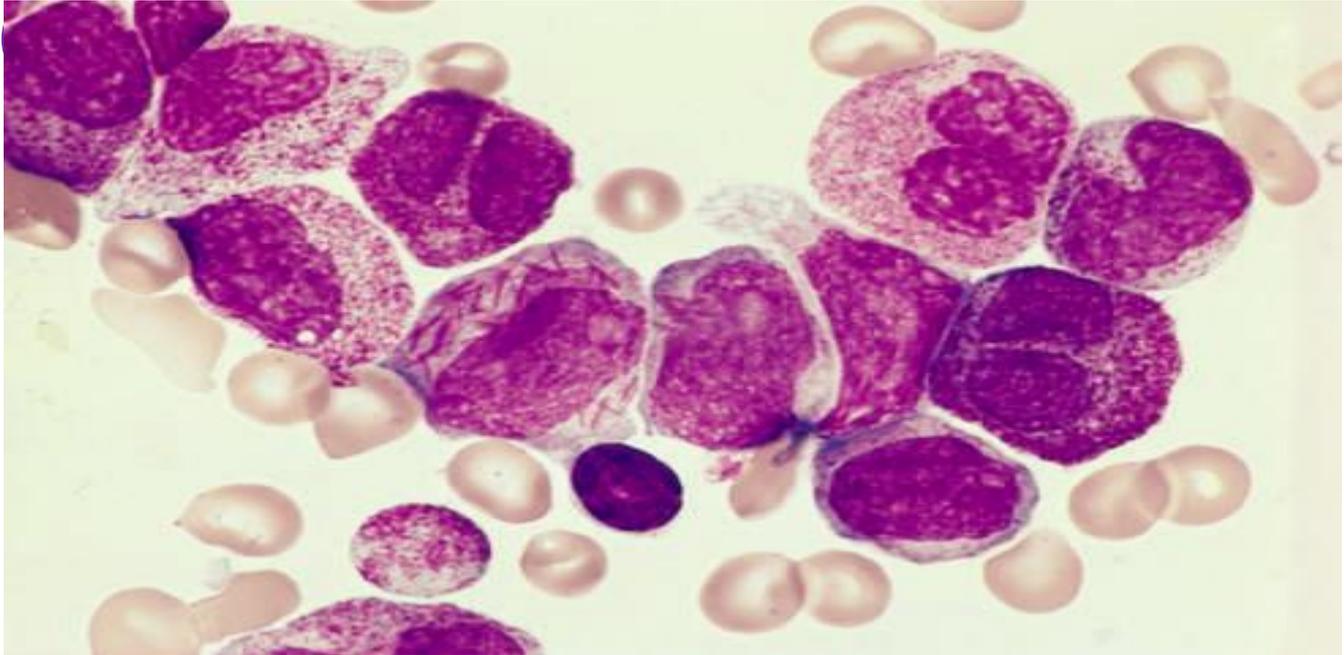


LYMPHOBLASTS



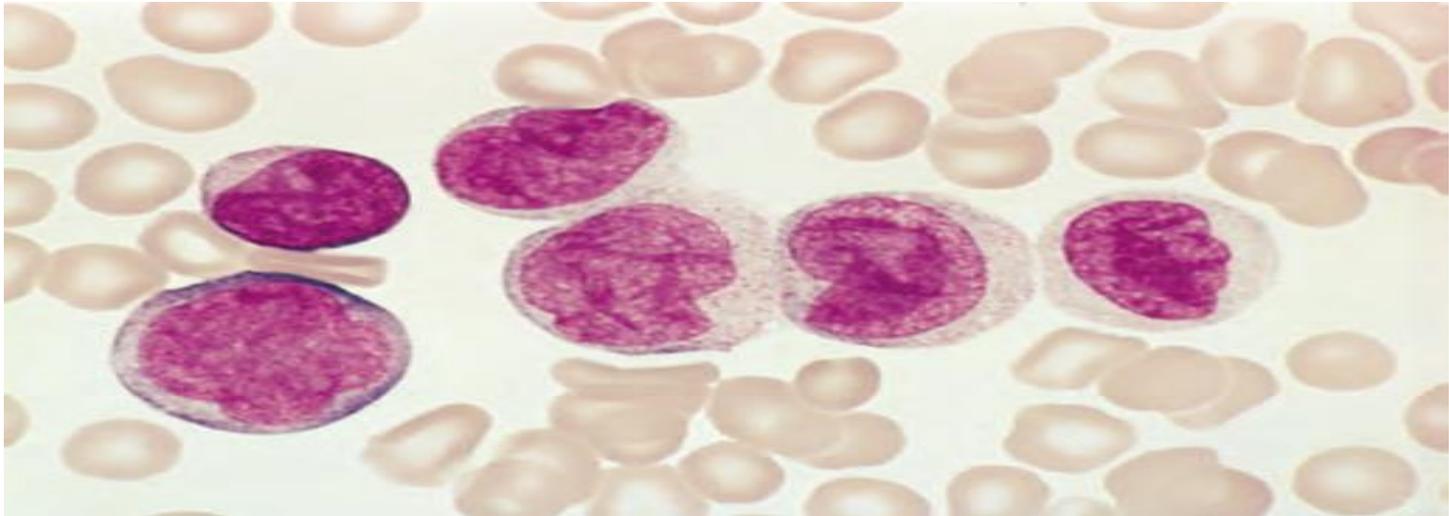
Acute myeloid leukemia (AML) – Morphology

Auer rods: distinctive red-staining needle-like azurophilic granules, present in many cases. **Numerous in acute promyelocytic leukemia**



Acute myeloid leukemia (AML) – Morphology

- ▶ **monoblasts and promonocytes:** have folded or lobulated nuclei, lack auer rods.



Acute myeloid leukemia (AML) - Clinical features

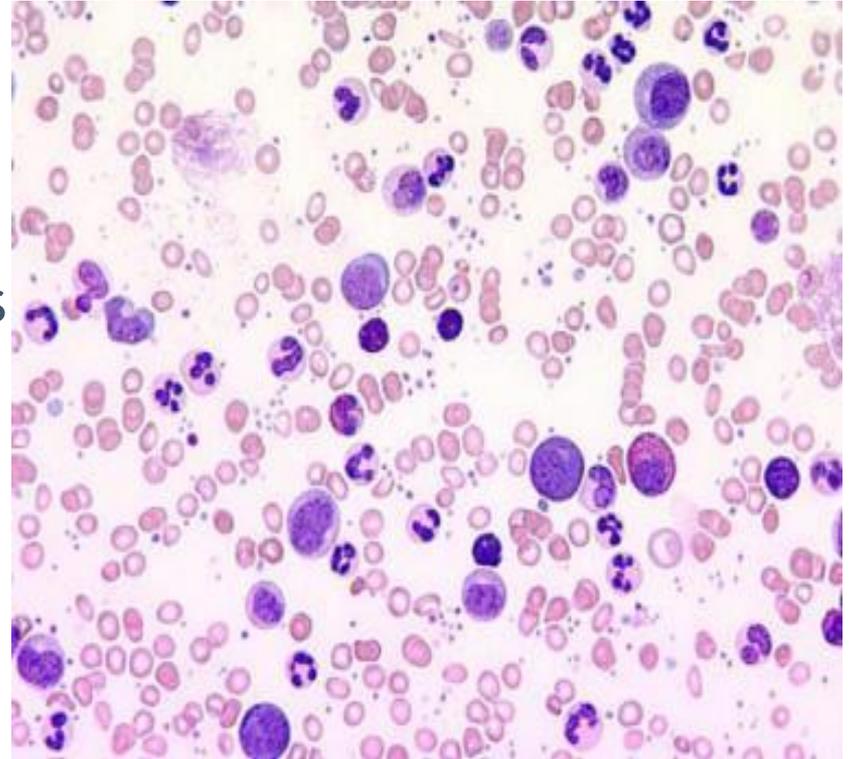
- ▶ Tumors with monocytic differentiation often infiltrate the skin (**leukemia cutis**) & the gingiva.
- ▶ AML IN soft-tissue mass (orbital mass) → myeloblastoma or **granulocytic sarcoma**



CML - Morphology

Peripheral blood

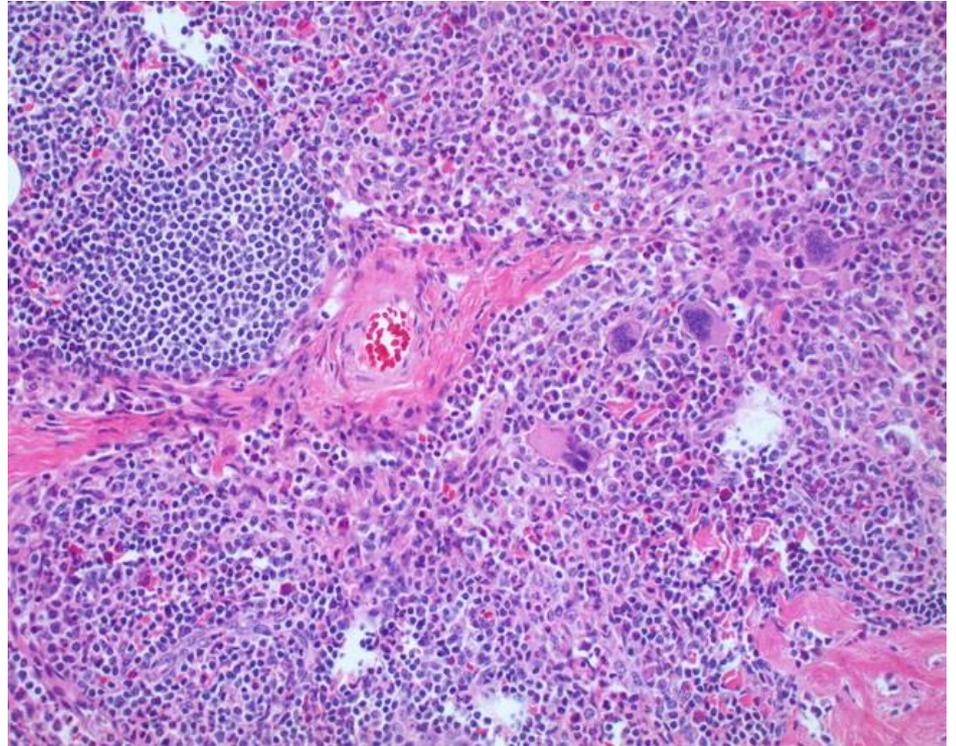
- ▶ Leukocyte count is $\uparrow\uparrow$ (often $>100,000$ cells/ μL).
- ▶ neutrophils, metamyelocytes & myelocytes.
- ▶ Basophils, eosinophils & platelets are increased



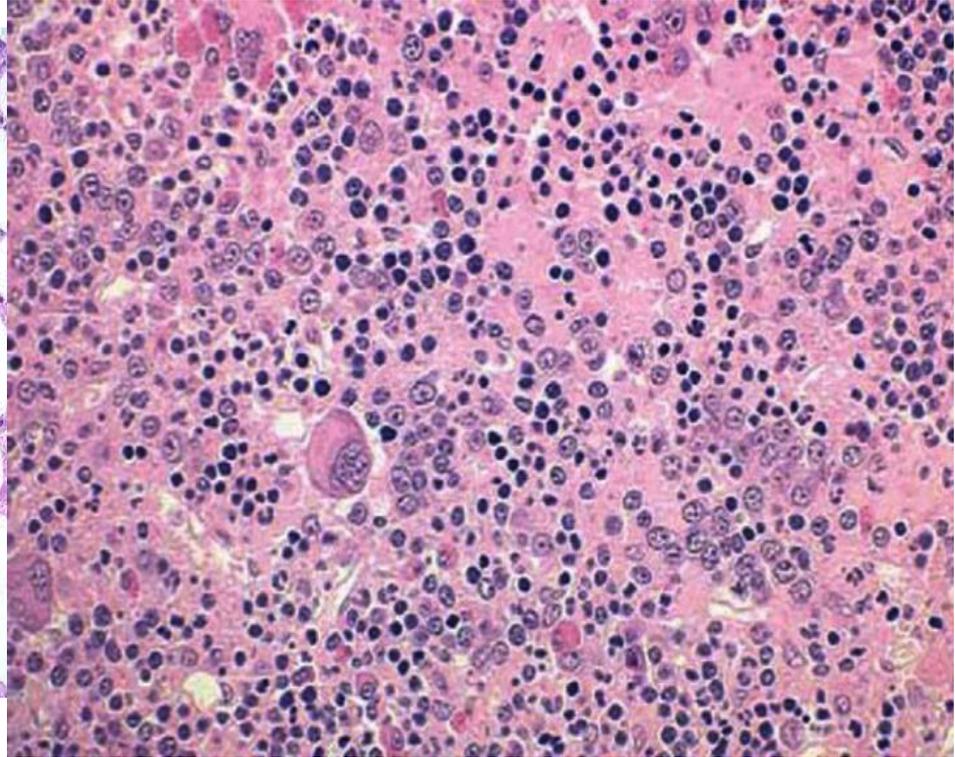
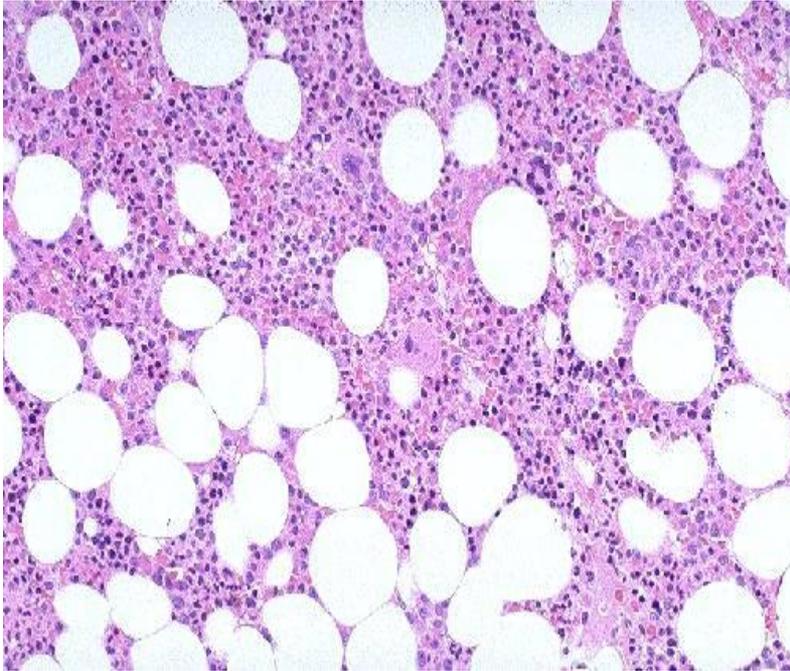
CML - Morphology

BM & spleen

- ▶ Spleen resembles BM → extensive extramedullary hematopoiesis.

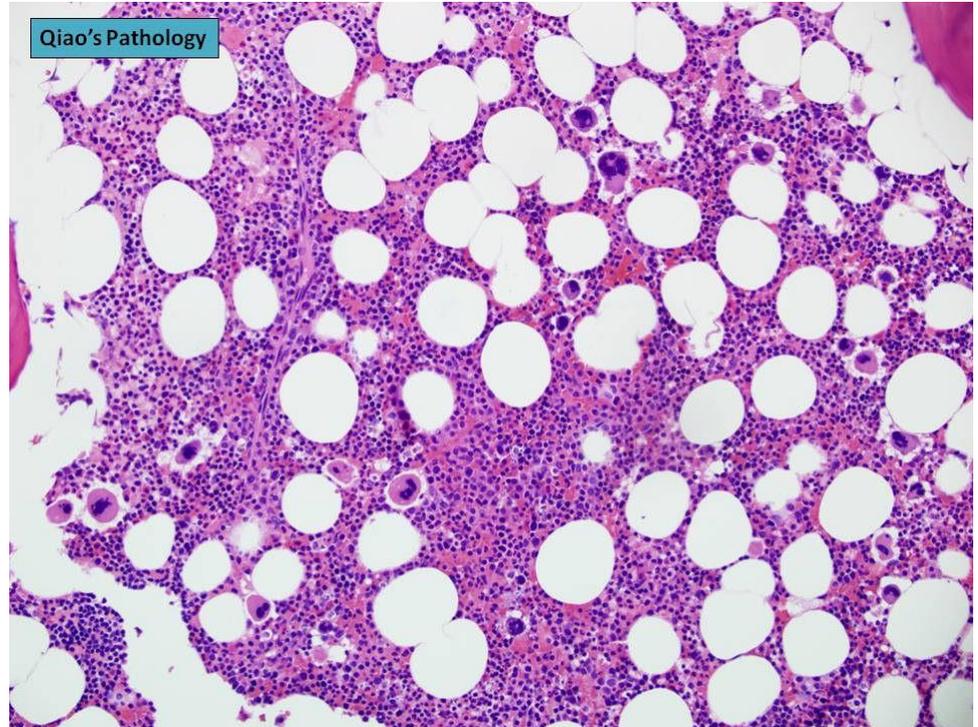


PCV - Morphology



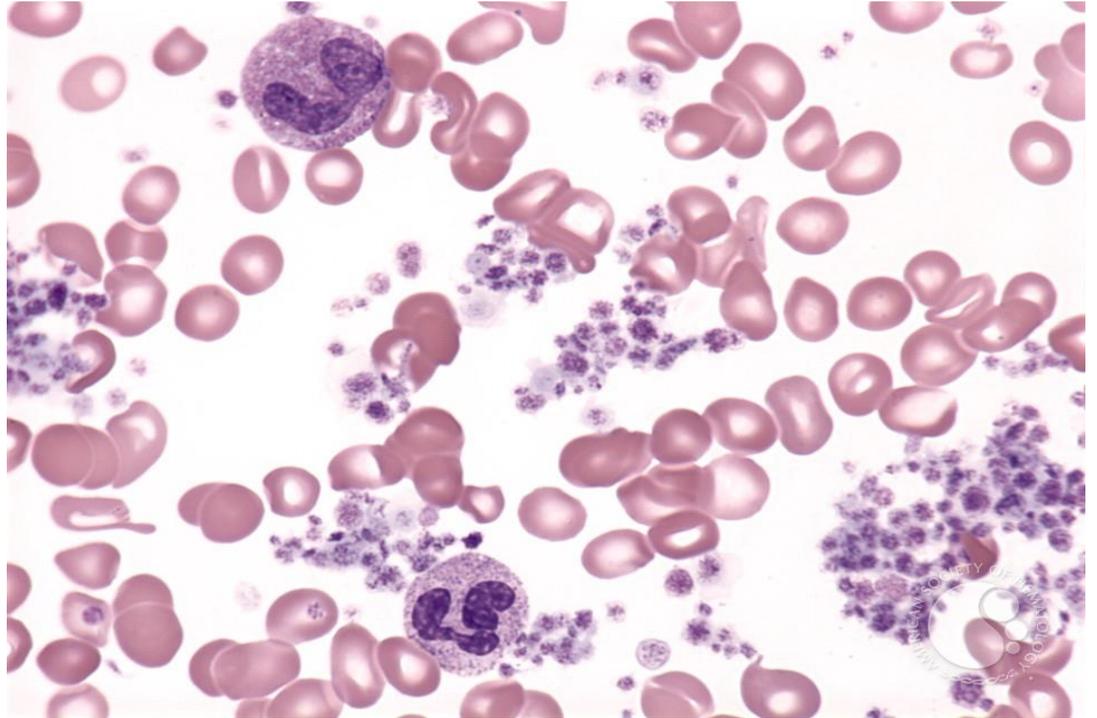
Essential Thrombocythemia – Morphology

- ▶ Bone marrow mildly increased cellularity & megakaryocytes are markedly increased in number with abnormal large forms.



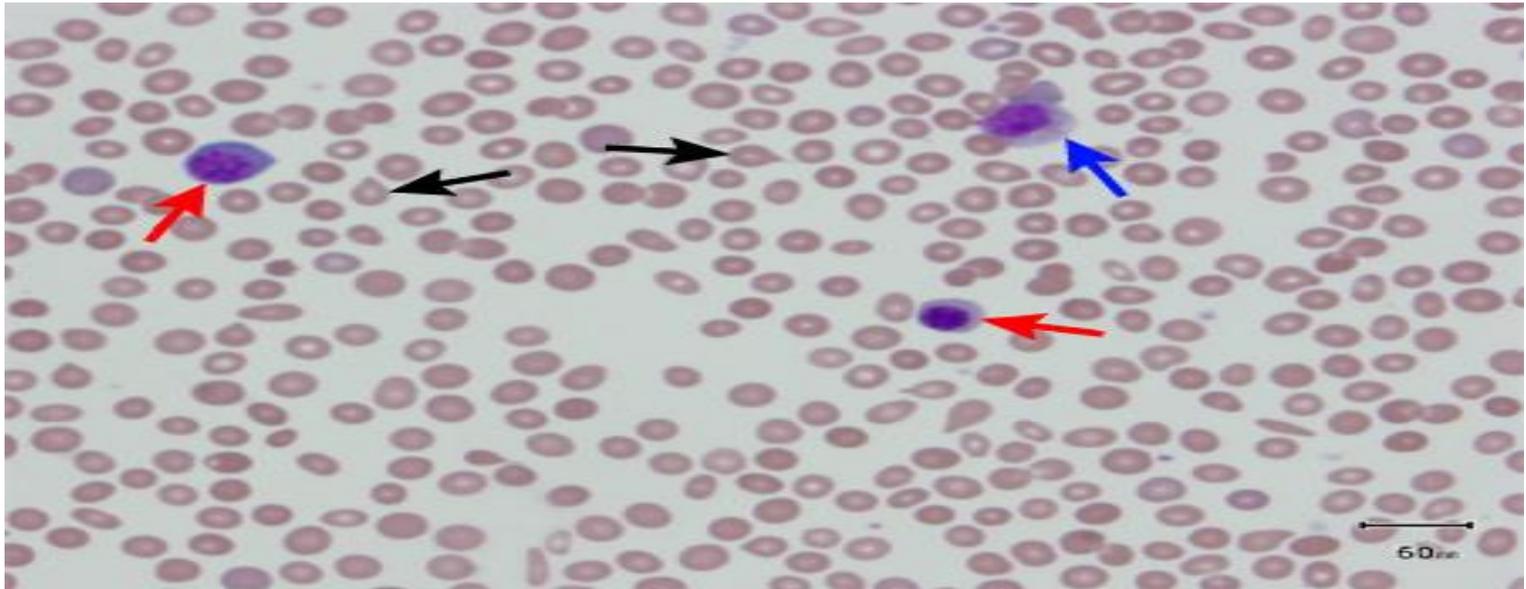
Essential Thrombocythemia – Morphology

Peripheral smears:
abnormally large
platelets often
accompanied by mild
leukocytosis.



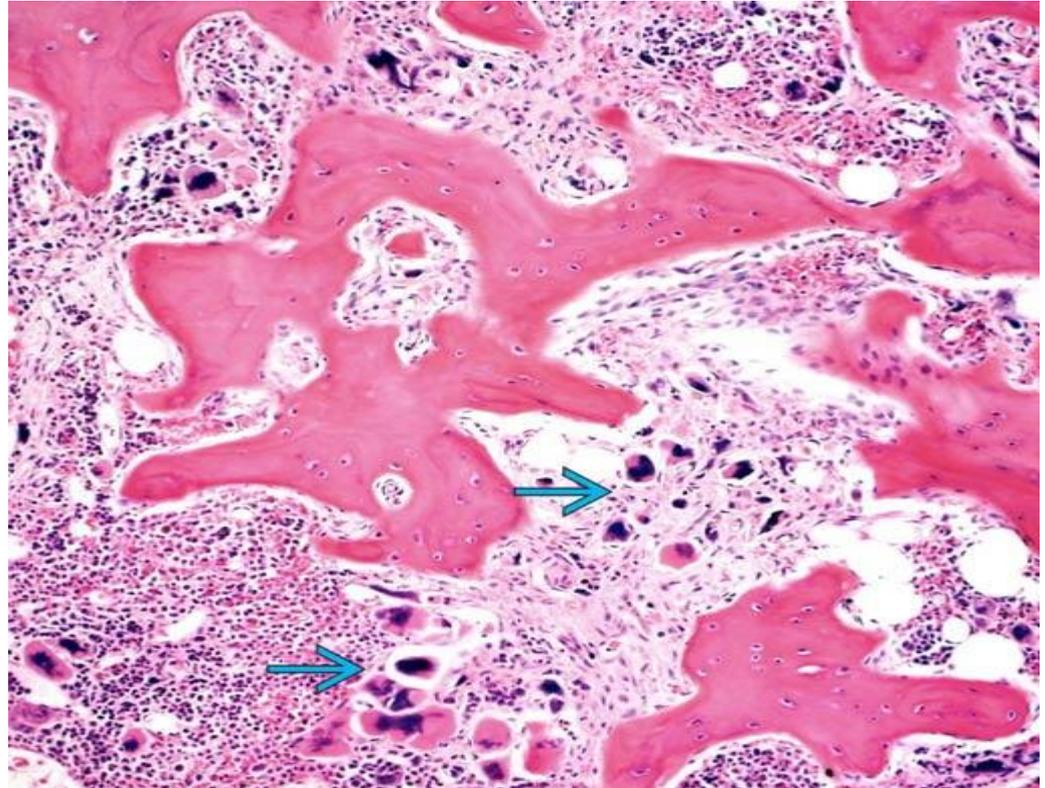
PM - Morphology

PB smear showing 2 nucleated RBCs (red), 2 tear drop RBCs (black) and a myelocyte (blue)



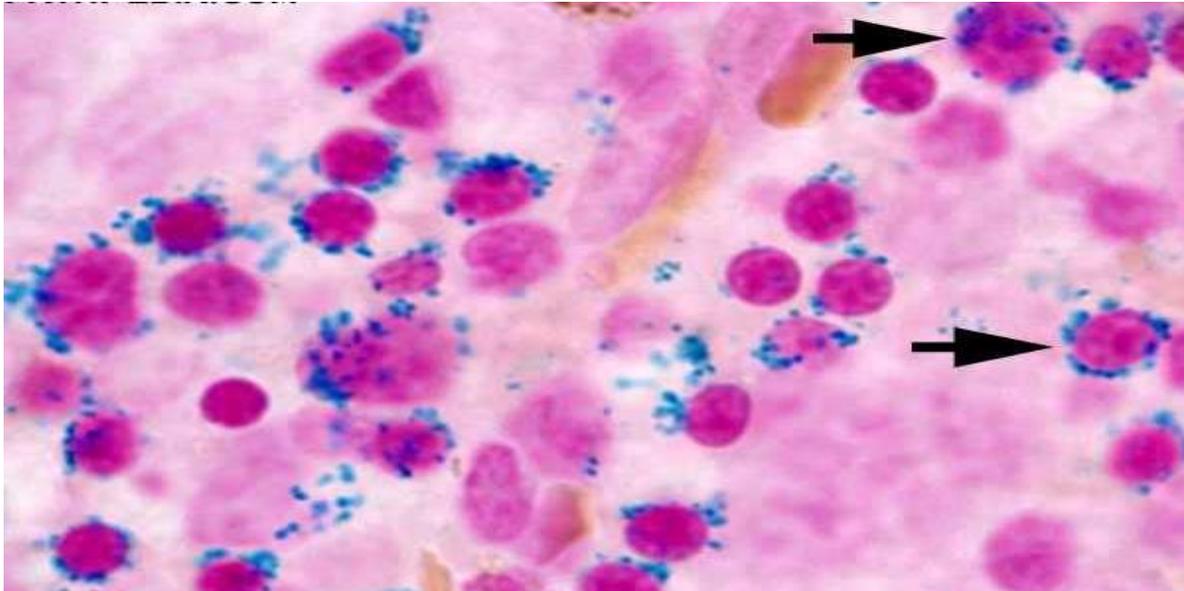
PM - Morphology

+BM in advanced cases is hypocellular; diffusely fibrotic and sclerotic.
+Abnormally large and clustered megakaryocytes.



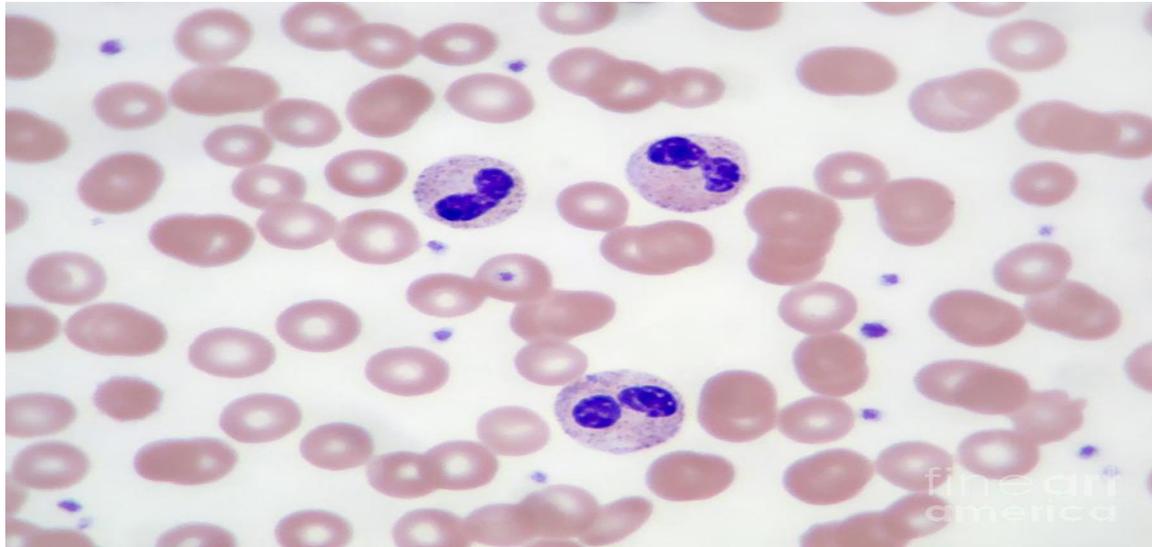
MDS - Morphology

Erythroid: iron deposits (ring sideroblasts)



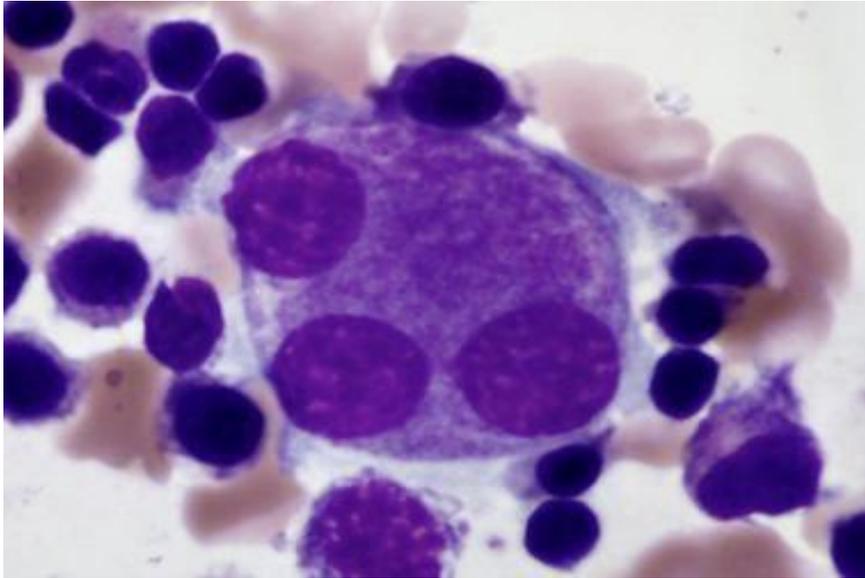
MDS - Morphology

Pseudo-Pelger-Huet cells, neutrophils with only two nuclear lobes



MDS - Morphology

Megakaryocyte: single nuclear lobes or multiple separate nuclei (pawn ball megakaryocytes)



As long as you have hard work in your stride good Luck will always be by your side.