

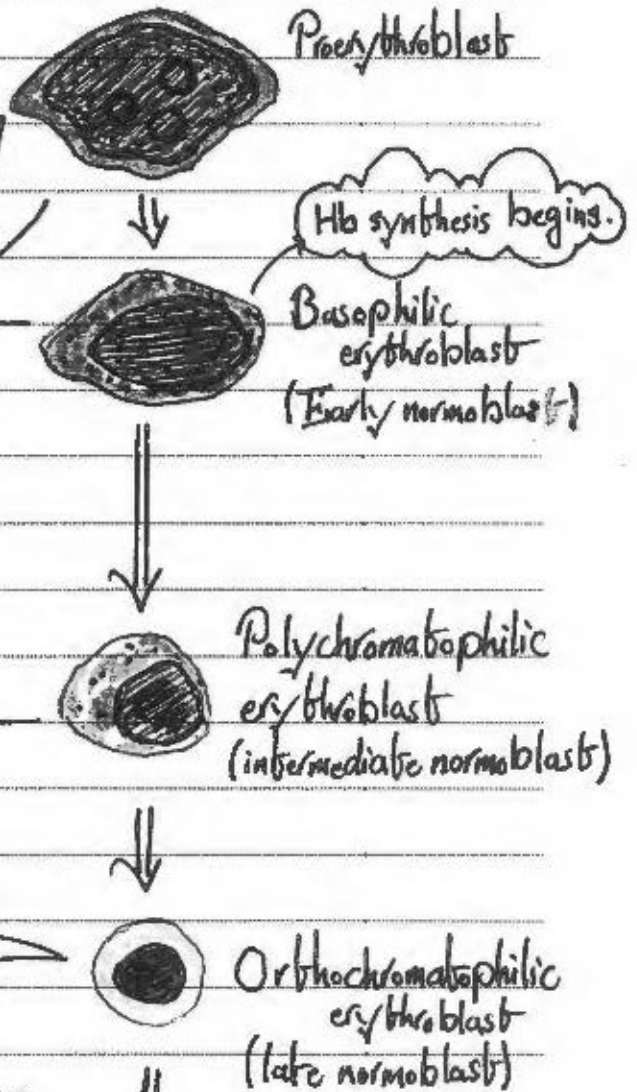
Erythropoiesis (Red Cell Formation)

- ↳ this process takes about 1 week.
- ↳ controlled by the hormone erythropoietin.

YOU can't find hemoglobin in the 1st stage (Proerythroblast)

In these 2 stages the cytoplasm appears (basophilic) → due to the presence of numerous ribosomes.

In this stage, the cytoplasm varies from "blue-grey" to "slate-grey"



(Acidophilic Erythroblast) → it loses its nucleus.

after 24-48 hours of release they complete their maturation into

Reti-culo-cyte (conc. in blood < 1%) (it is released into the circulation).
 Erythrocyte

↳ their No can increase after hemorrhage & in certain anaemias.

Note: radiotherapy, leukemia & chemotherapy reduce erythropoiesis & destroy the bone marrow (BM).

(-blast = precursor)

While Erythropoiesis goes toward Erythrocytes formation, different aspects start to change:

- 1) cells are decreasing in their sizes.
- 2) progressive loss of organelles.
- 3) progressive increase in Hemoglobin content \Rightarrow account for increasing eosinophilia (pink staining)

✓ Important Note:

Hemoglobin is found in all stages, except the 1st one, which is (Proerythroblast).

Granulopoiesis (granulocytes formation)

- The 1st stage doesn't appear in the slides -
This stage is called (Myeloblast)

✓ cytoplasm: light blue

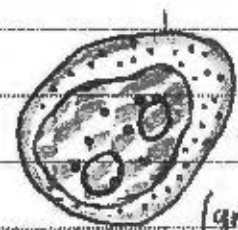
✓ Nucleus: - fine chromatin.
- 2-3 pale nucleoli.

There are No granules in this stage.



✓ In this stage \Rightarrow the 1st azurophilic granules are formed here (appear dark & small).

nucleus: reddish blue with coarse chromatin.

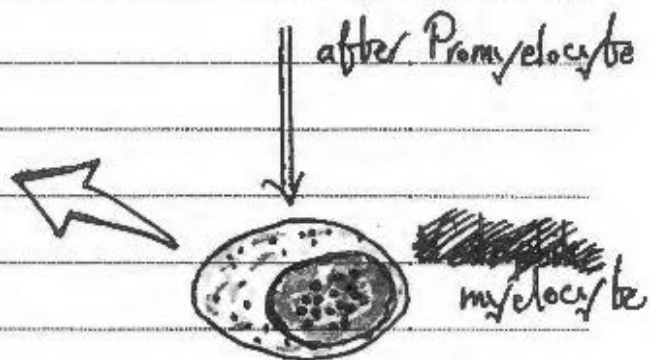


Promyelocyte (granules start to appear).

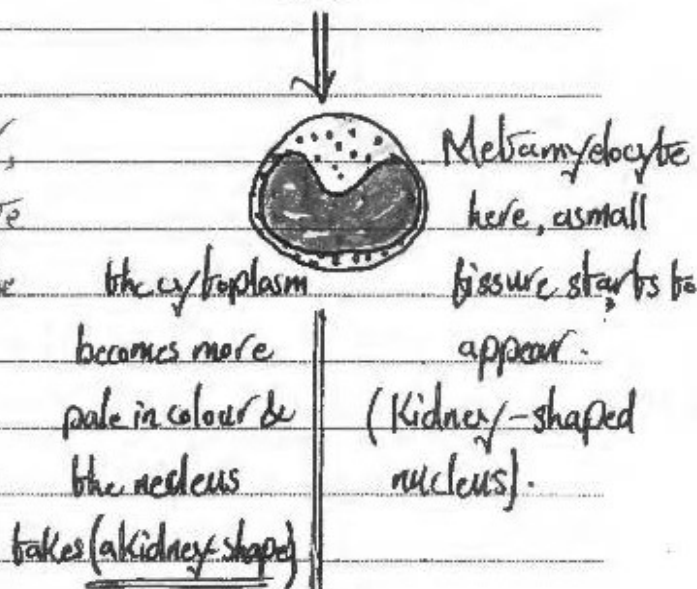
nucleoli are present.

These 2 stages are common in the formation of three different types of myelocytes:
1) Basophils. 2) Eosinophils. 3) Neutrophils.

In this stage, specific (secondary) granules gradually increase in quantity & eventually occupy most of the cytoplasm, with a further condensation of nucleus.



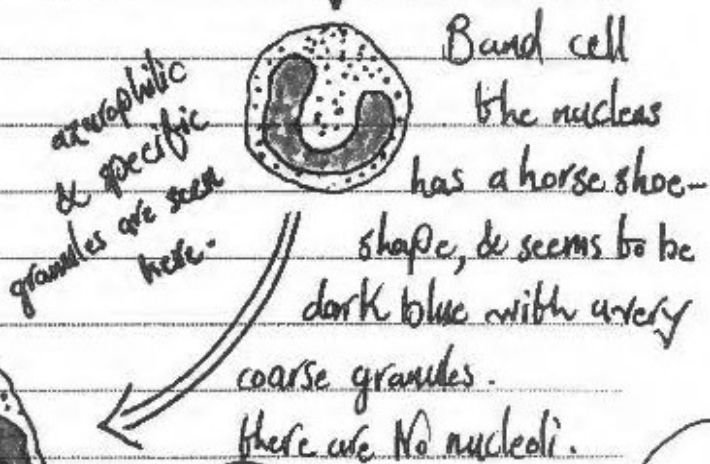
Both Promyelocytes & Myelocytes are - to some extent - very similar to each other, you might even not be able to differentiate between them \Rightarrow So, we depend on the type of granules found for that.



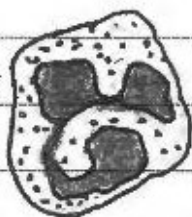
Very important

In Metamyelocyte stage, the nucleoli is absent.

while in Myelocyte stage, the nucleoli are small & can be seen only on FIM.



Polymorphonuclear (mature) cell



this stage is found only in Neutrophils, but it is absent in eosinophils & basophils.

By Tariq Bushnaq ...

Thanks to Hamzeh Salameh & Tamer Salhab
for their notes.

Some important histologic & clinical notes:

- both Band & Mature Neutrophils increase in Bacterial infections, you might even see myelocytes & metamyelocytes in the blood stream.

- In Acute leukemia \Rightarrow there is an increase in the undifferentiated cells (myeloblasts, promyelocytes & neutrophilic myelocytes).

While, in

chronic leukemia \Rightarrow

most of the proliferating cells are mature, which means that they will function normally \Rightarrow

so the patient will live longer than those with acute leukemia.

\Downarrow
This gives the patients a bad prognosis, because these cells are non-functional \Rightarrow so the patient won't live long.

- Although the No of granules in Basophils is less than that in eosinophils, their nuclei might be not visible, because these granules are large & densely basophilic.

- In case of pus formation, the patient might suffer from Throbbing Pain (pulsating pain).

Pus = (protein-rich fluid + dead leukocytes (mostly neutrophils) destroyed by macrophages).