

Warning

- please, do not manipulate the microscope,
- they are prepared for your study of blood smears after presentation,
- you will get instructions, how to study blood smears.



BLOOD, HEMATOPOIESIS

- Composition of blood.
- Blood corpuscles.
- Development of blood /hematopoiesis/.

Blood

55 % plasma

90 % H₂O

7 % plasma proteins

3 % -AAs, saccharids, lipids

-hormones

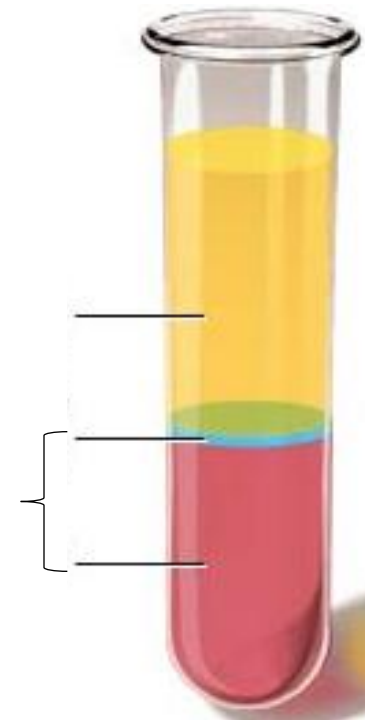
-electrolytes

45 % blood corpuscles

hematocrit

♂ 42 – 52 %

♀ 37 – 47 %



BLOOD CORPUSCLES

ERYTHROCYTES



7,2 - 7,6 μm

3.5-5.5 million/ μl

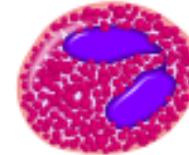
GRANULOCYTES
(polymorphonuclears)

neutrophilic



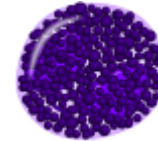
10 - 12 μm

eosinophilic



12 - 14 μm

basophilic



8 - 10 μm

LEUKOCYTES

4.500-11.000/ μl

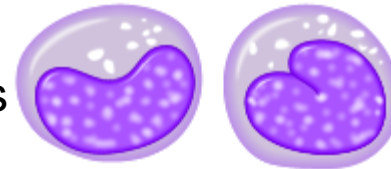
AGRANULOCYTES
(mononuclears)

lymphocytes



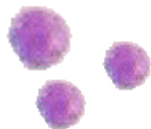
6 - 8 / 10 - 12 μm

monocytes



12-20 μm

THROMBOCYTES



2 - 4 μm

150.000-400.000/ μl

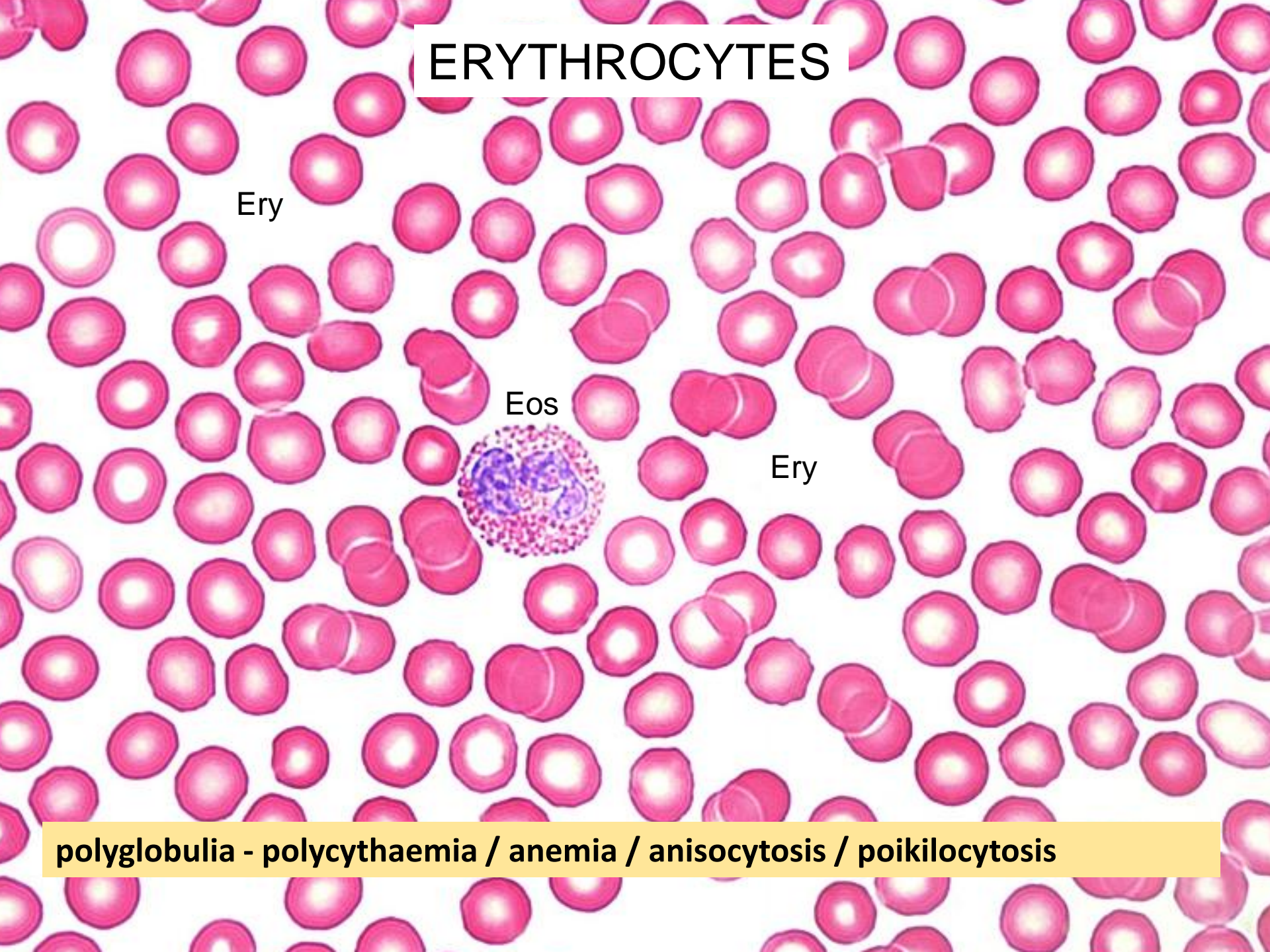
ERYTHROCYTES

Ery

Eos

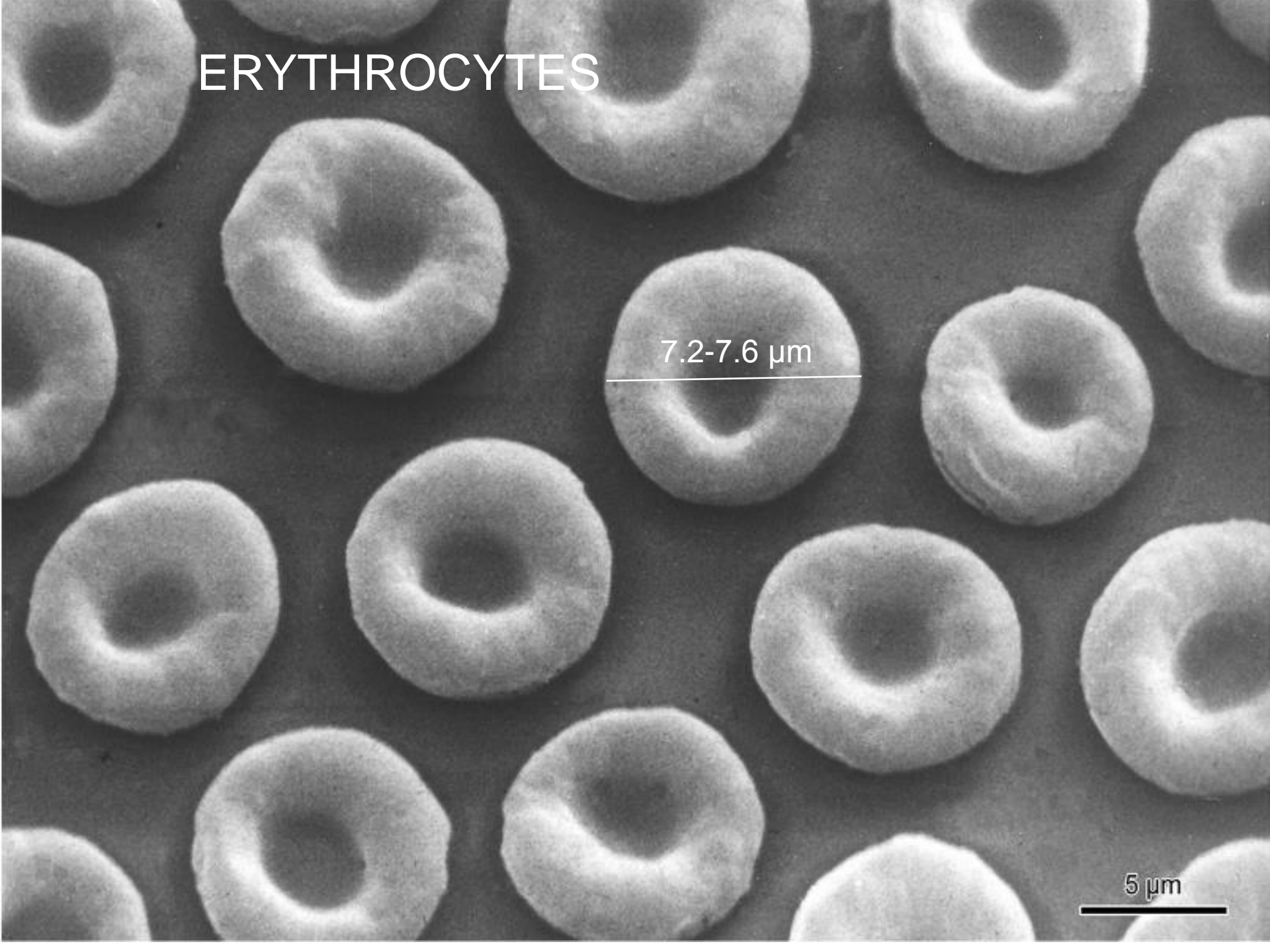
Ery

polyglobulia - polycythaemia / anemia / anisocytosis / poikilocytosis

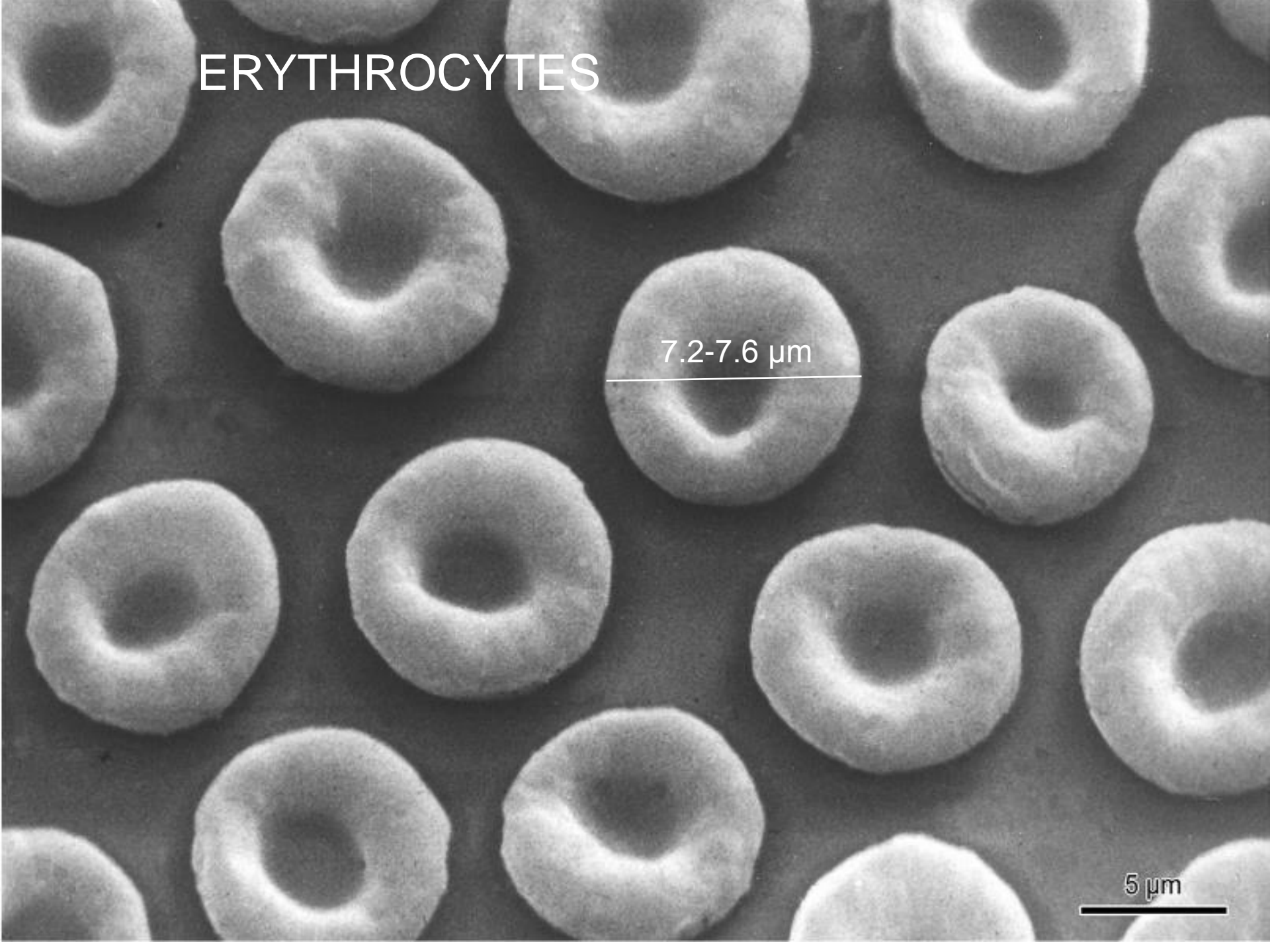


ERYTHROCYTES

7.2-7.6 μm

A grayscale micrograph showing numerous erythrocytes (red blood cells) with a characteristic biconcave disc shape. A white horizontal line is drawn across the diameter of one of the cells in the center of the image, with the text "7.2-7.6 μm" positioned above it.

5 μm

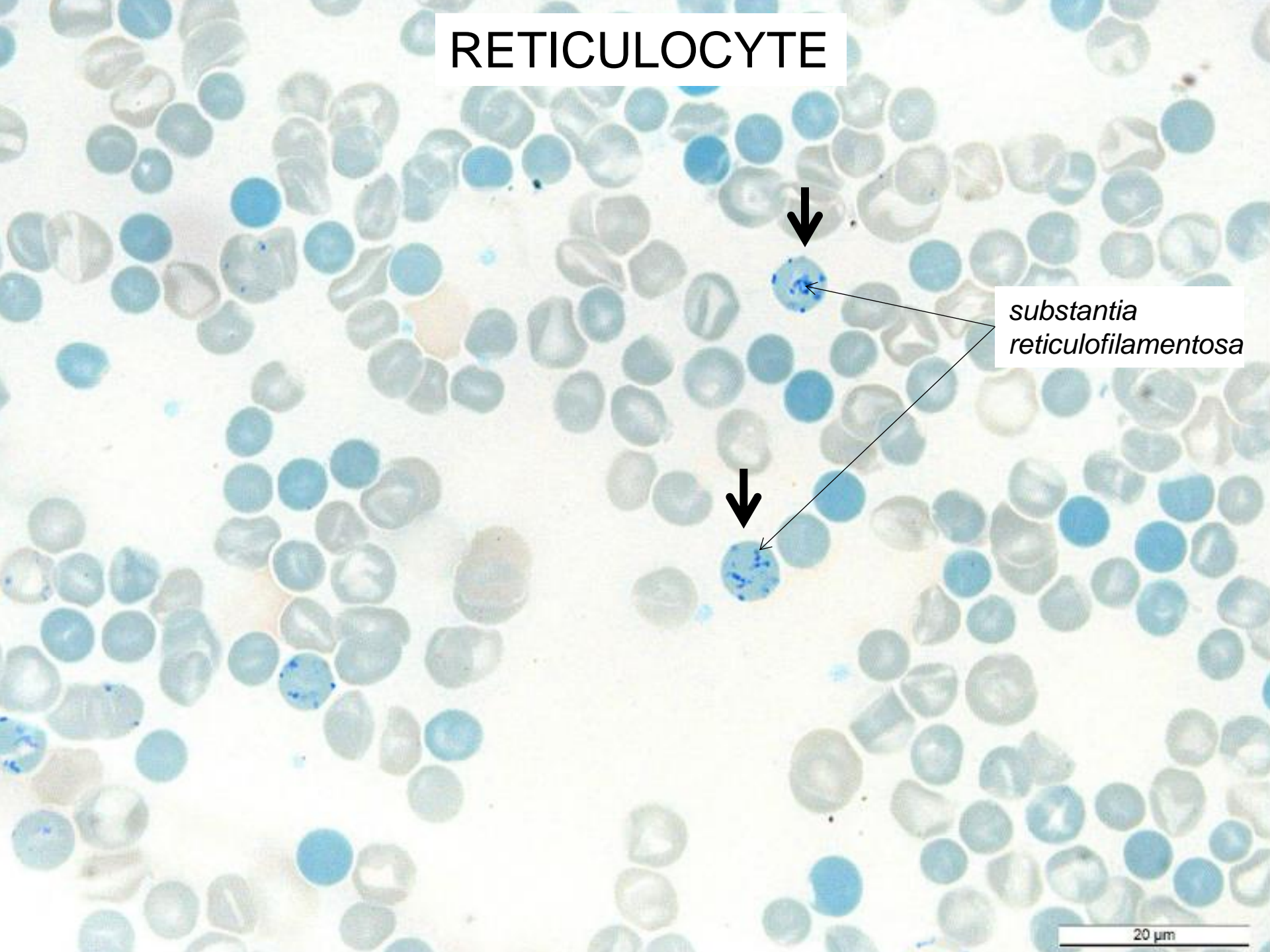
A grayscale micrograph showing numerous erythrocytes (red blood cells) with a characteristic biconcave disc shape. A black horizontal scale bar is located in the bottom right corner of the image, with the text "5 μm" positioned above it.

A transmission electron micrograph showing a cross-section of a cell. The central feature is a large, dark, electron-dense area, which is the nucleus of an erythrocyte. This nucleus is surrounded by a thin layer of cytoplasm containing various organelles, including mitochondria and endoplasmic reticulum. The cell is bounded by a plasma membrane. The surrounding area shows the cytoplasm of another cell, likely a neighboring erythrocyte, with similar internal structures. The overall appearance is that of a typical mammalian erythrocyte in cross-section.

ERYTHROCYTE

0,5 μm

RETICULOCYTE

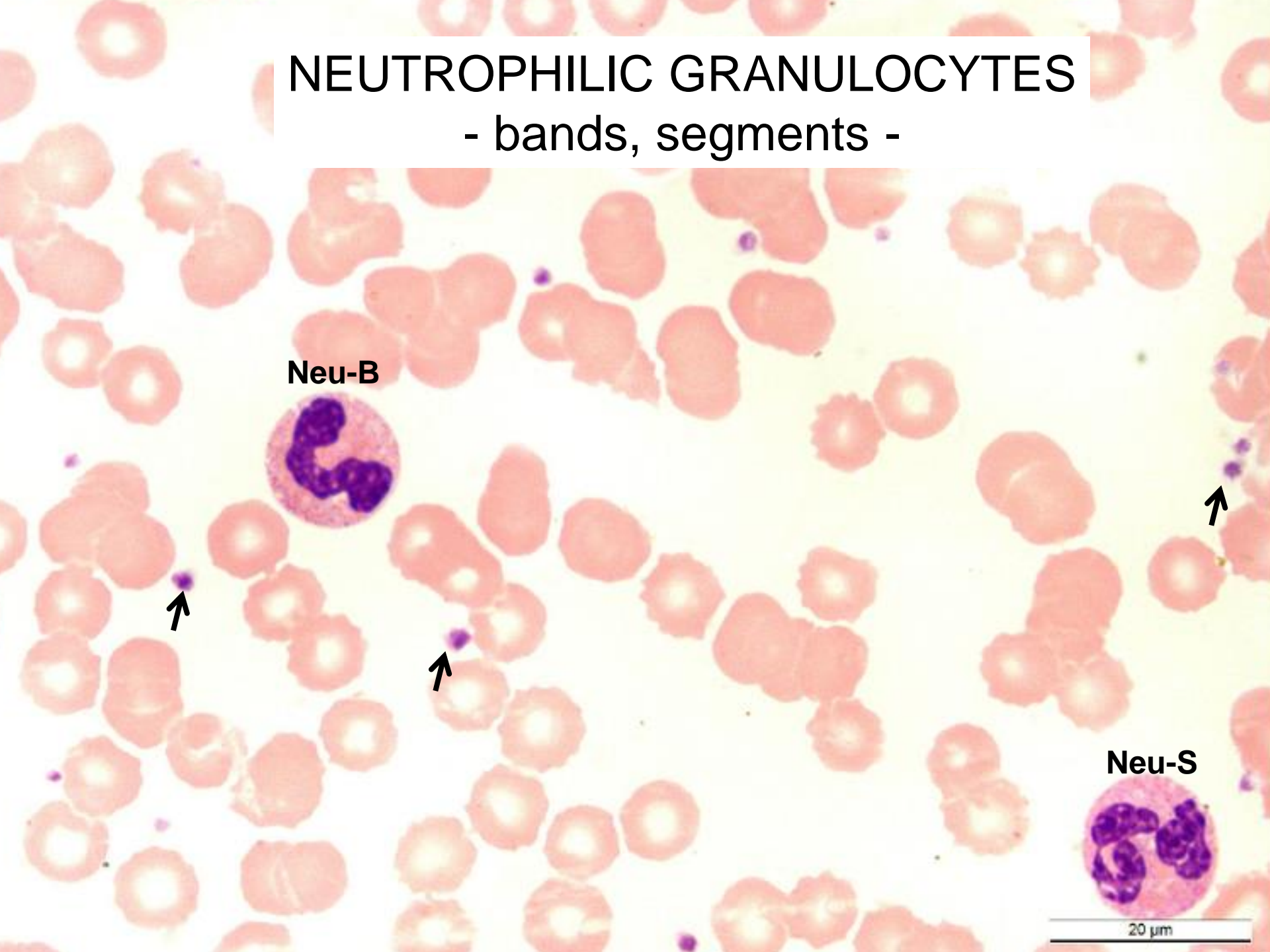


*substantia
reticulofilamentosa*

20 μm

NEUTROPHILIC GRANULOCYTES

- bands, segments -

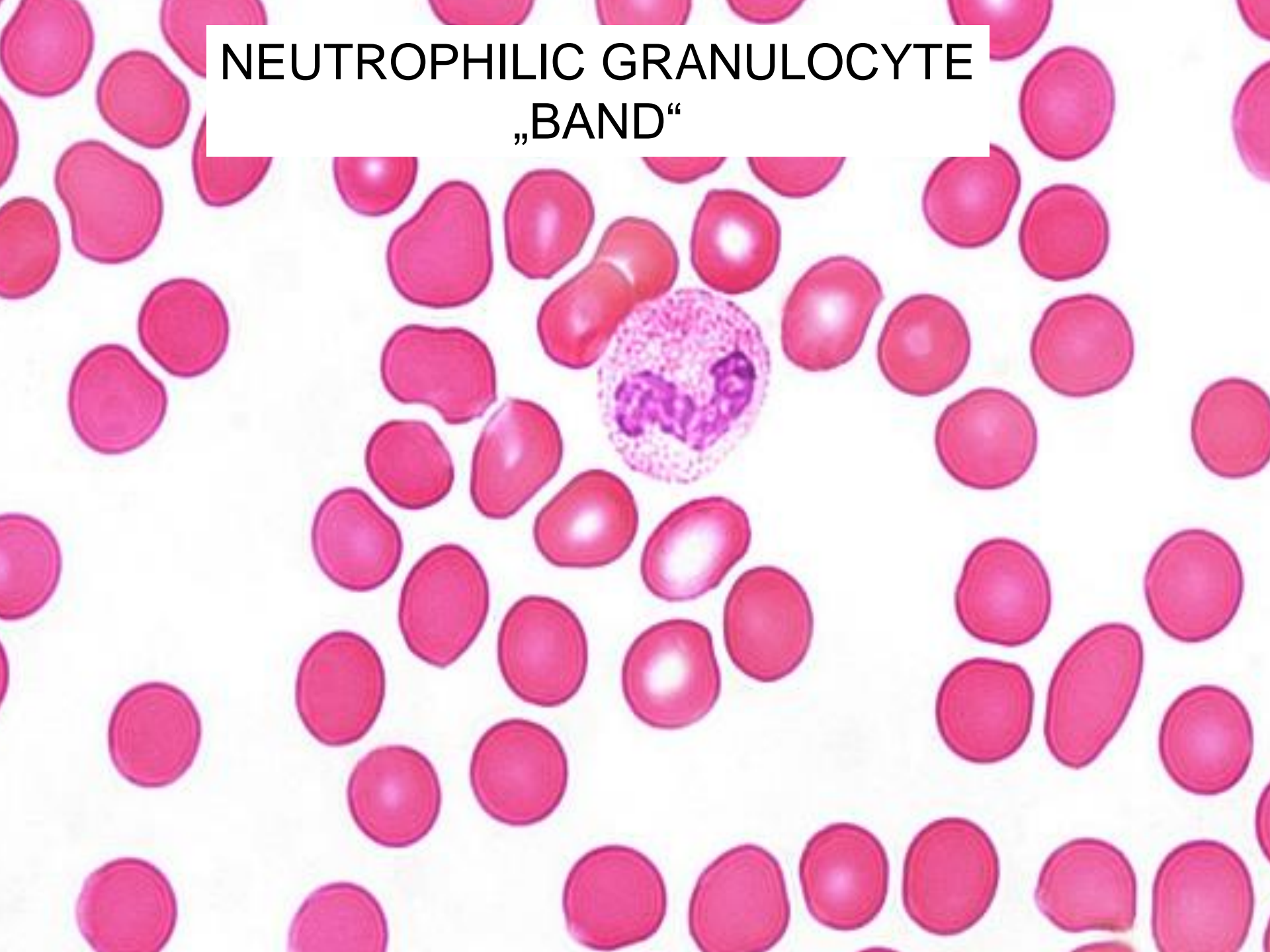


Neu-B

Neu-S

20 μ m

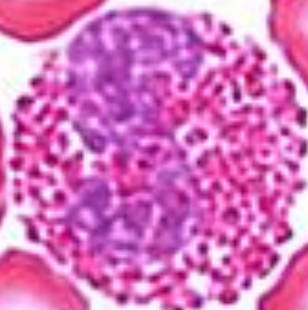
NEUTROPHILIC GRANULOCYTE „BAND“



NEUTROPHILIC GRANULOCYTE
„SEGMENT“



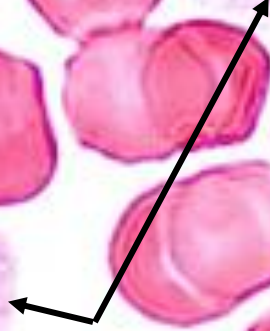
EOSINOPHILIC GRANULOCYTE



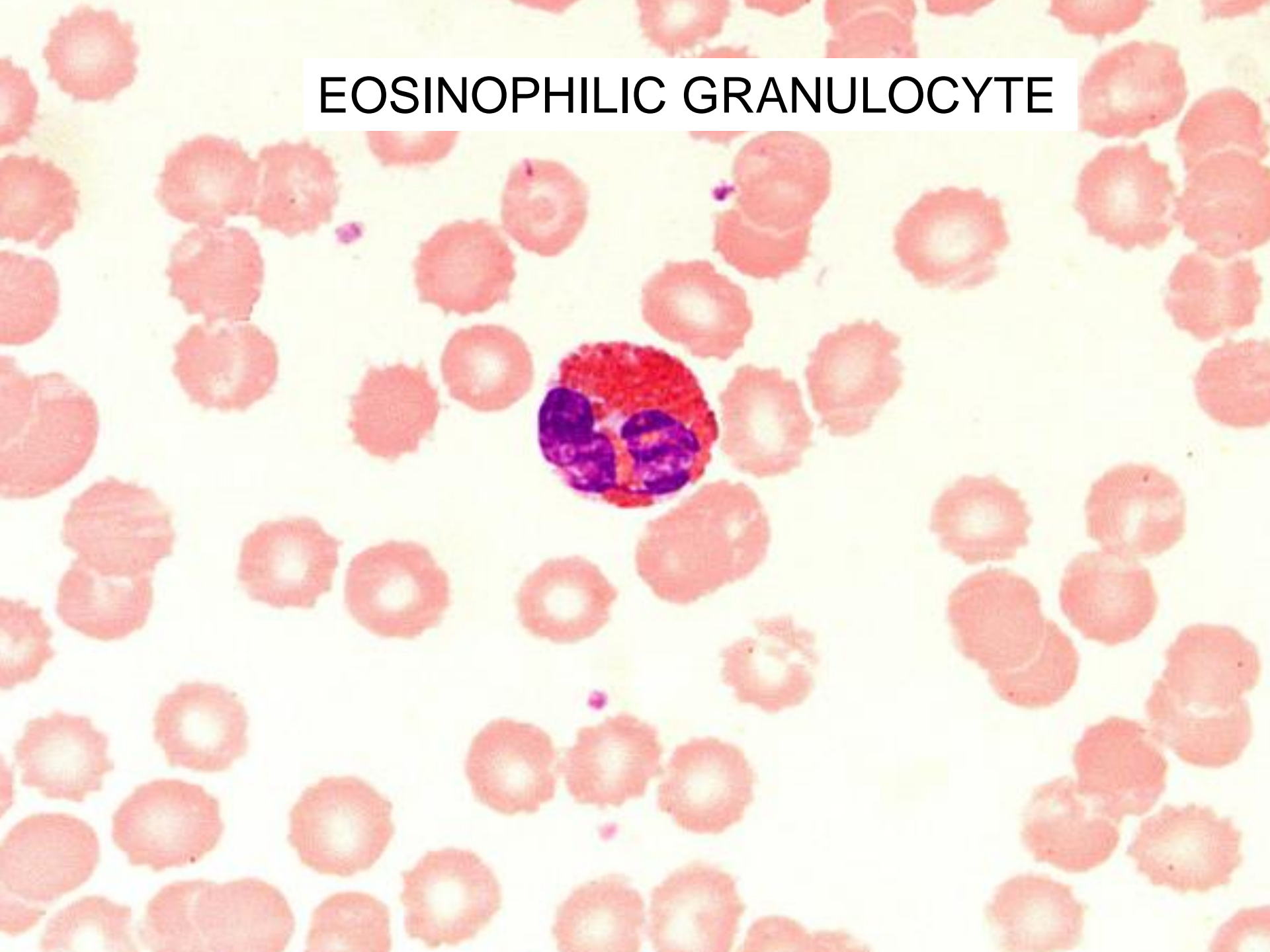
Eos



Neu



EOSINOPHILIC GRANULOCYTE



EOSINOPHILIC GRANULOCYTE



0,5 μm

BASOPHILIC GRANULOCYTE



LYMPHOCYTE



LYMPHOCYTE

0,5 μm



MONOCYTE and LYMPHOCYTE



Mono



Ly

20 μ m

MONOCYTE and „NEUTROPHIL“

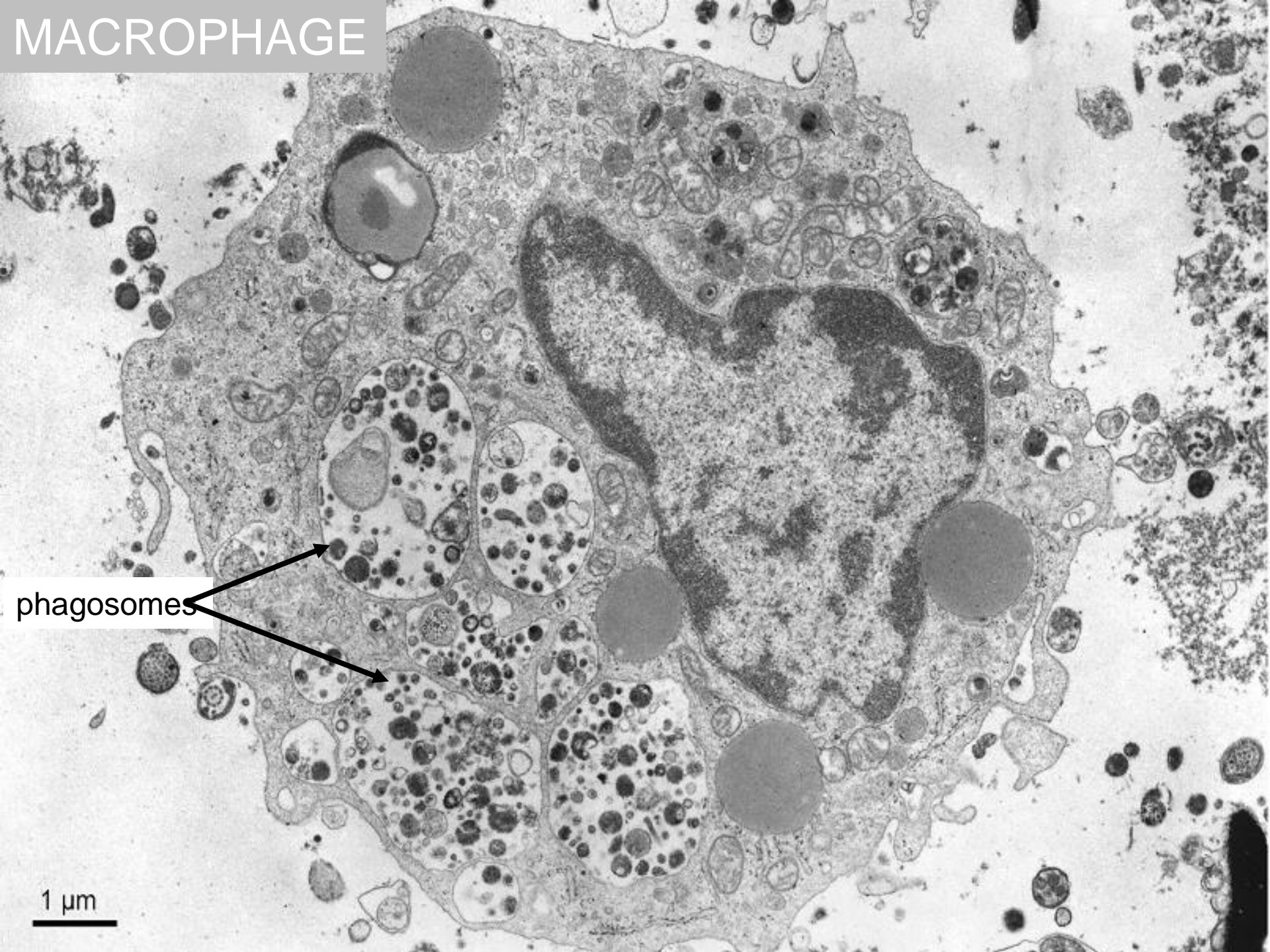
Mono



Neu



MACROPHAGE

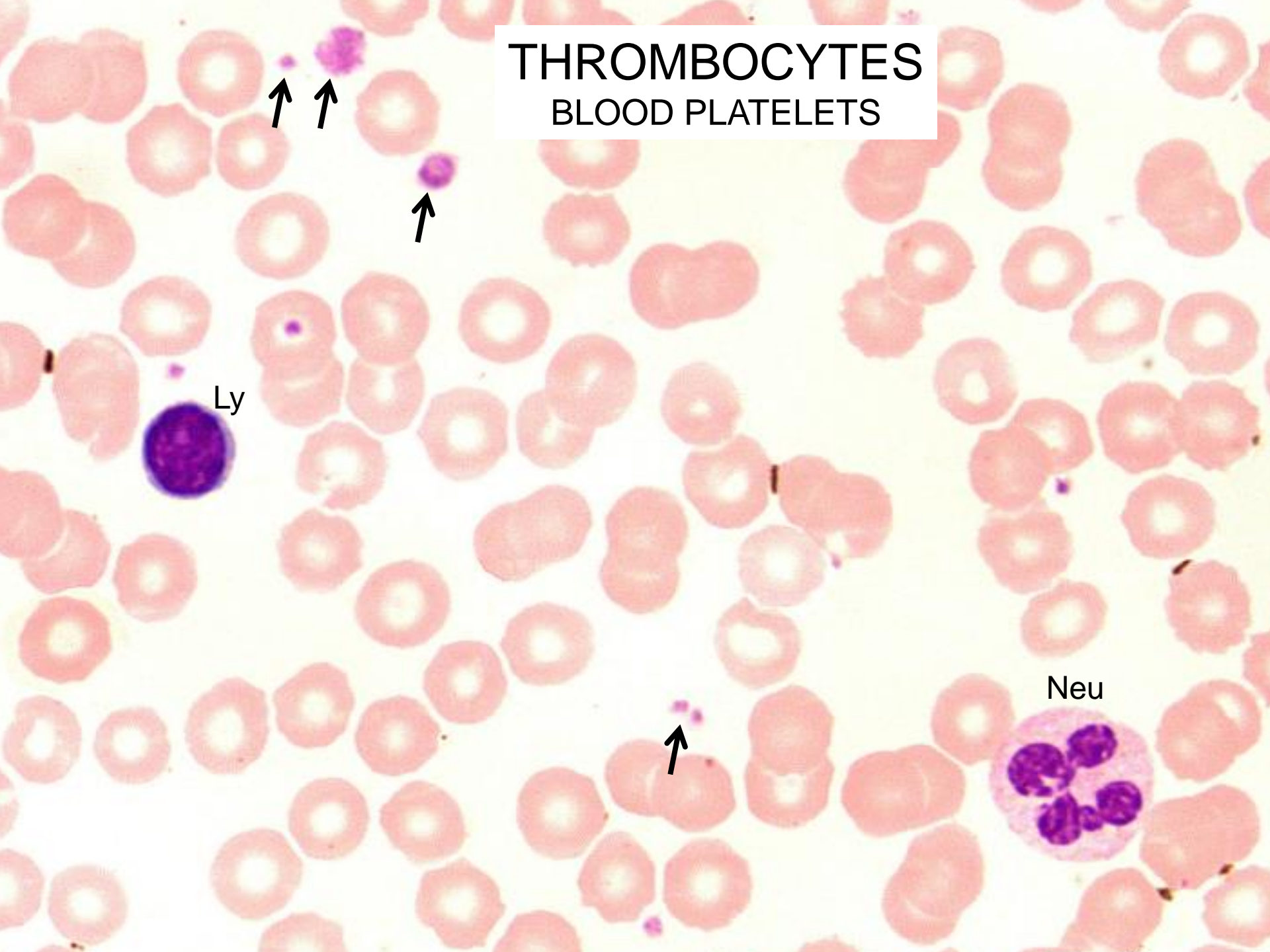


phagosomes

1 μ m

THROMBOCYTES

BLOOD PLATELETS



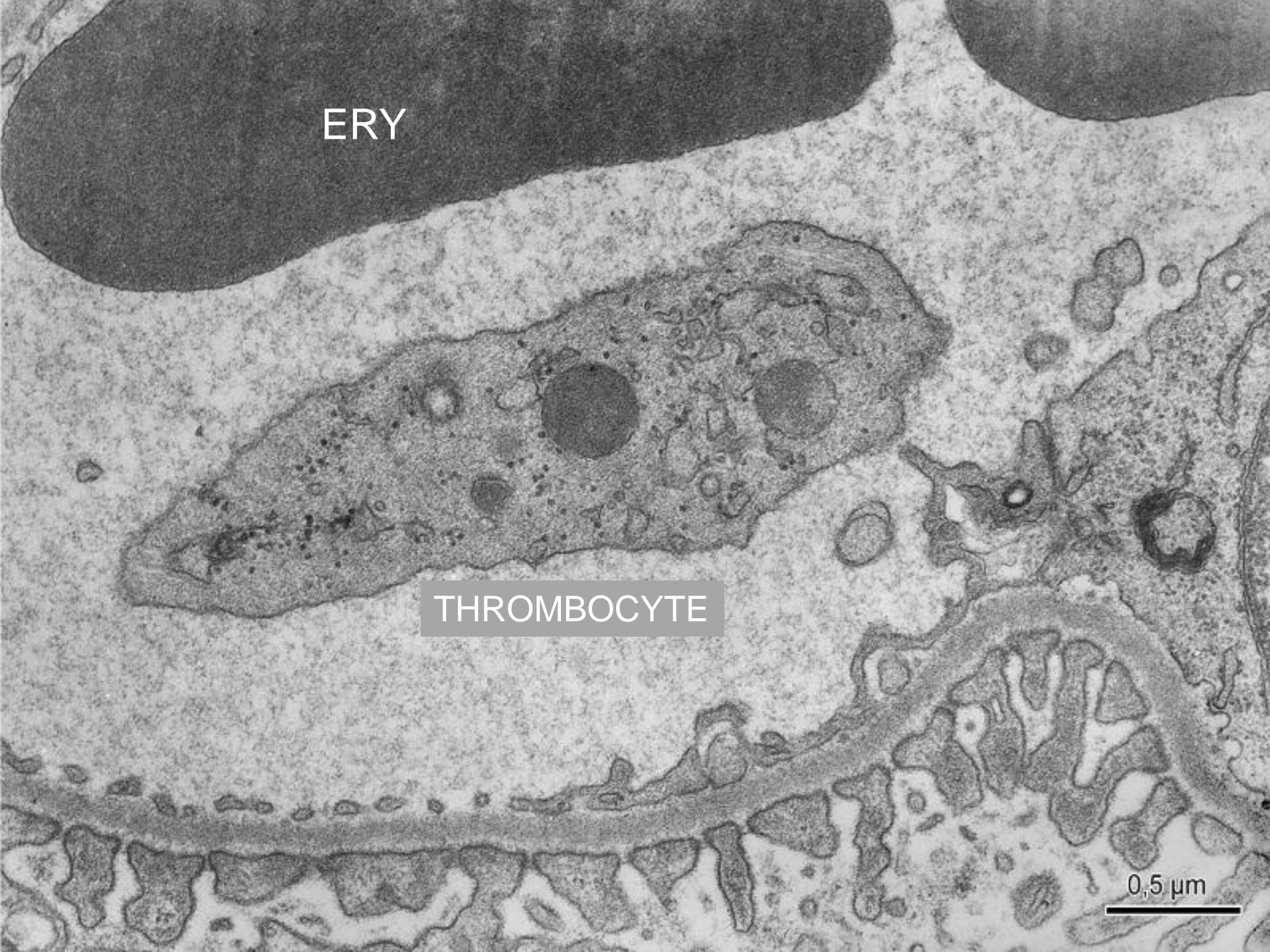
Ly

Neu

ERY

THROMBOCYTE

0,5 μ m





BLOOD

Slide

Peripheral blood smear, panoptic staining (method of Pappenheim), immersion oil, magnif. 1000x

How to study blood smear in LM?

- Lens of immersion objective /magnifying 100x/ is immersed into drop of immersion oil and blood smear is prepared for study.
- Switch on the microscope and check the picture in the microscope.
- If the image is not sharp, focus it using fine adjustment knob! If it is not possible, contact your teacher.