

If we strive for Excellence
We have to be Prepared



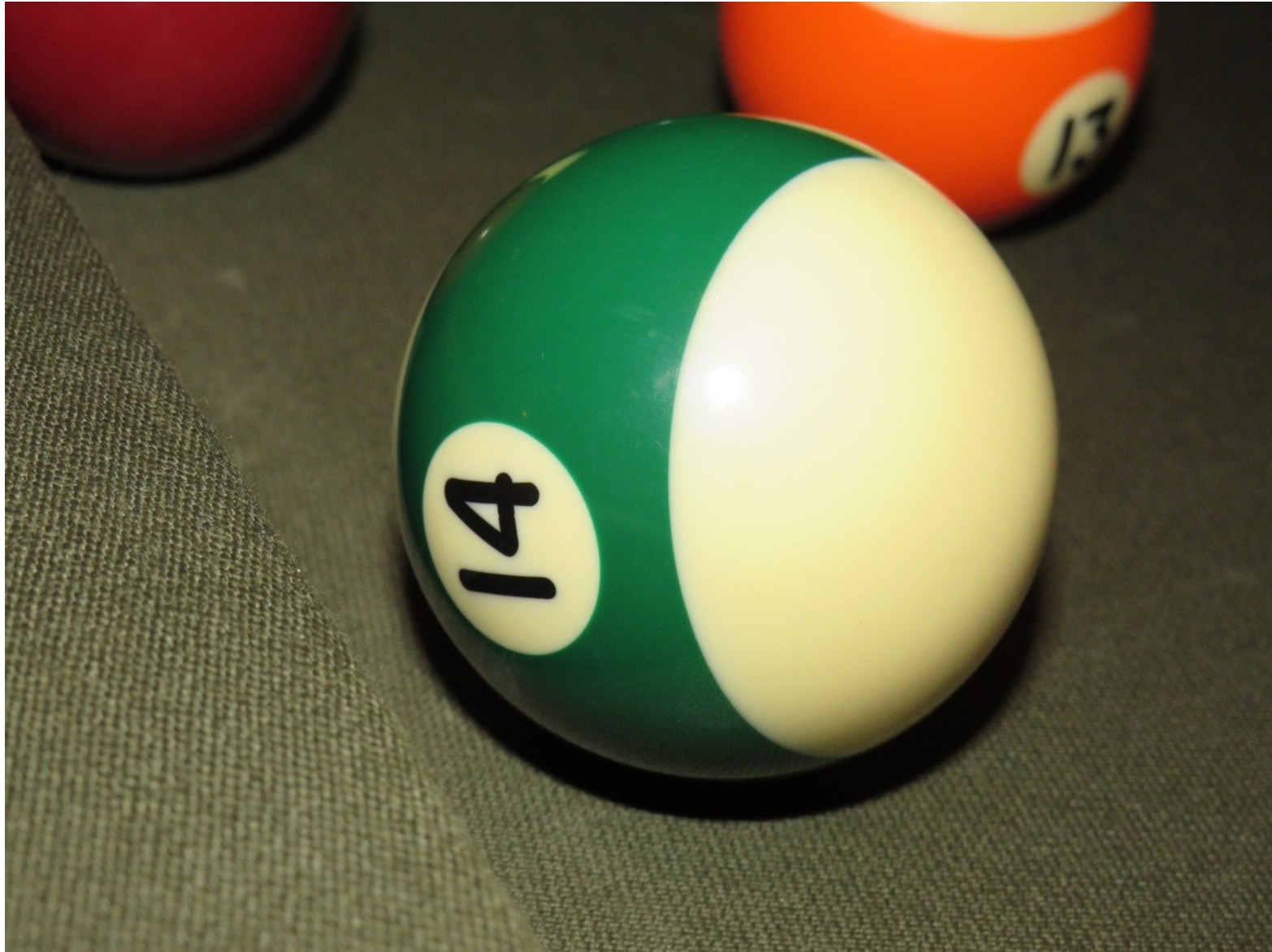
To be Challenged
In our Comfortable Truths

Retrieval Practise

Because it is what works to make it like cinnamon

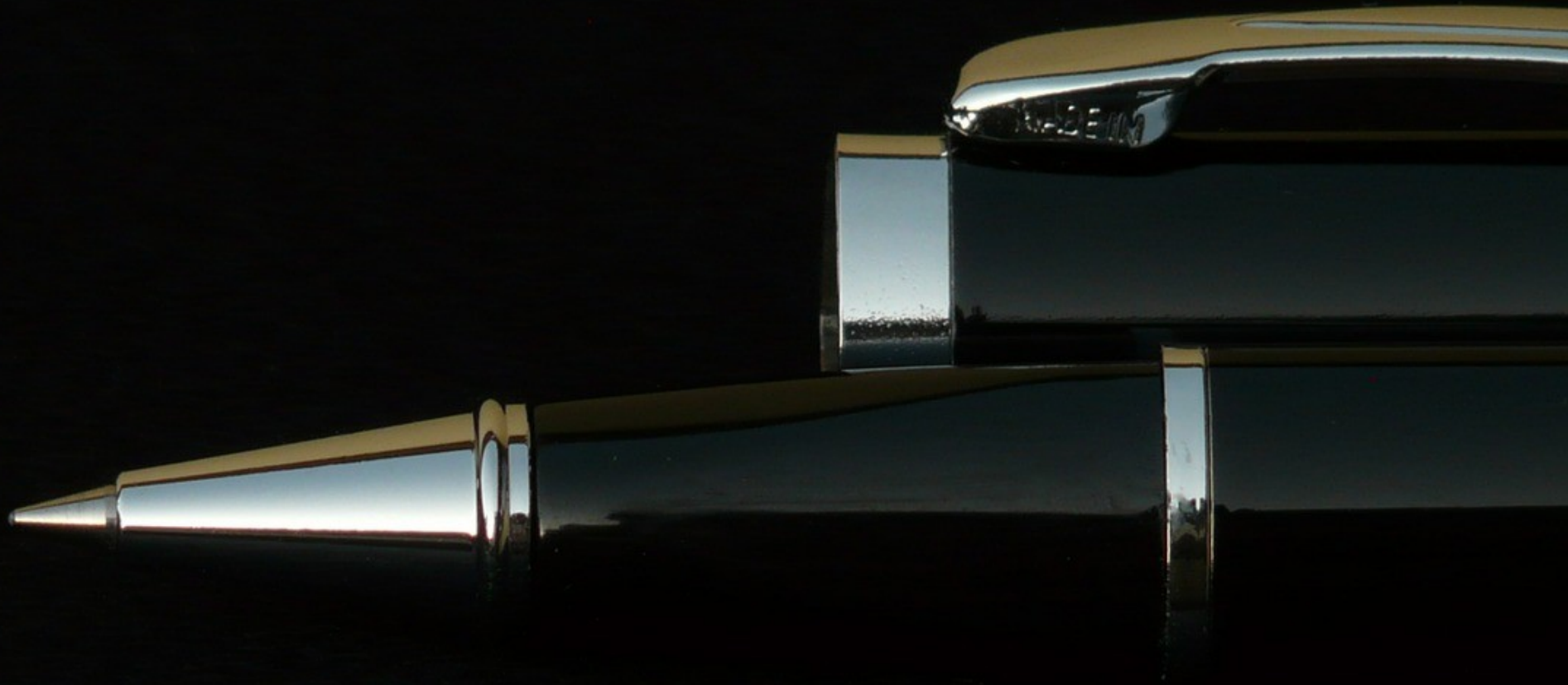


14 Questions



RULES

Ink!!!



Best Effort!



No Consultation



Google

x



https://www.google.com

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Google Search

I'm Feeling Lucky

Assess yourself

Nailed it



Not sure



Nailed it!

You are
confident about
your answer.



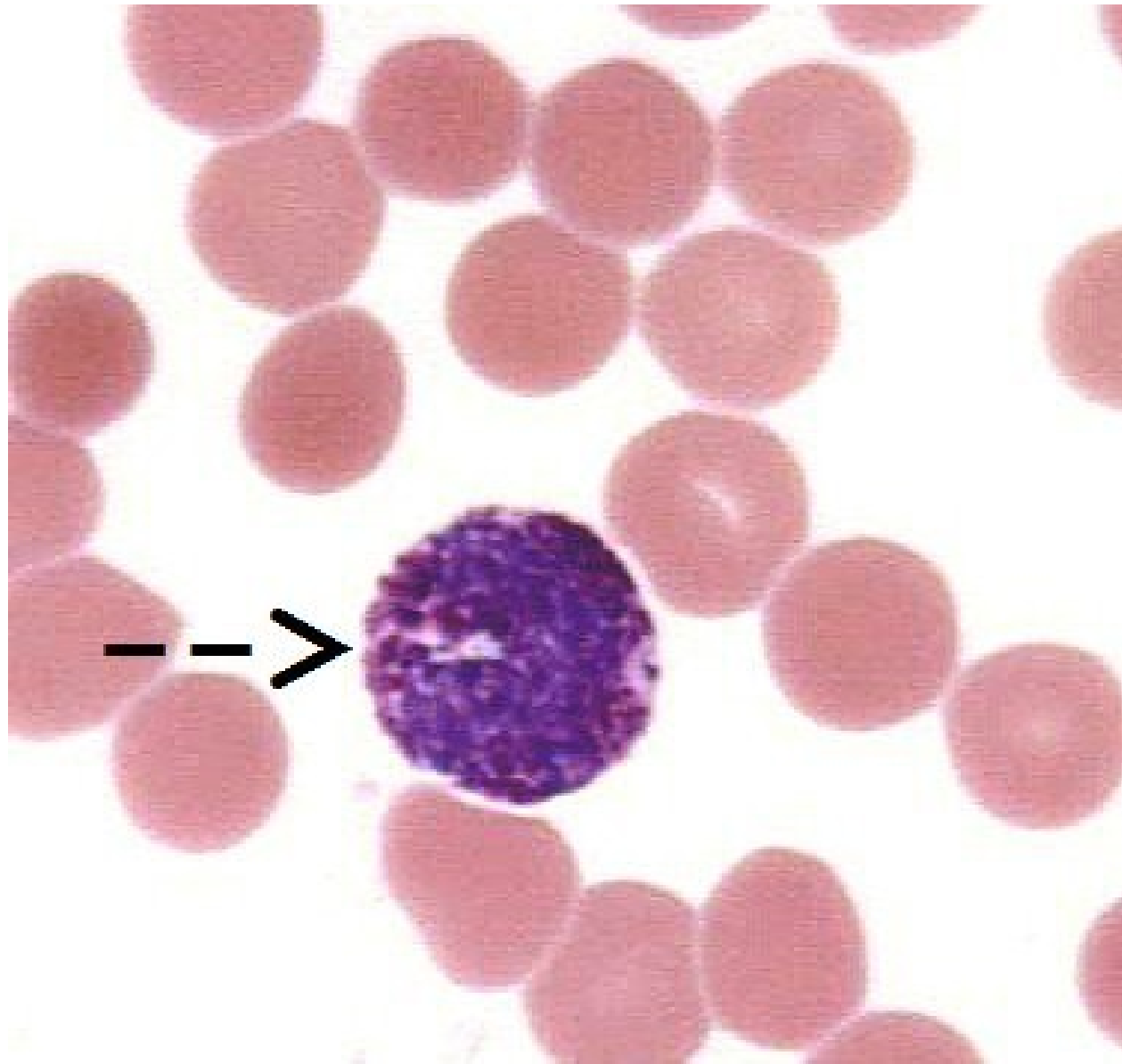
Not sure...

You do not know or
are uncertain.

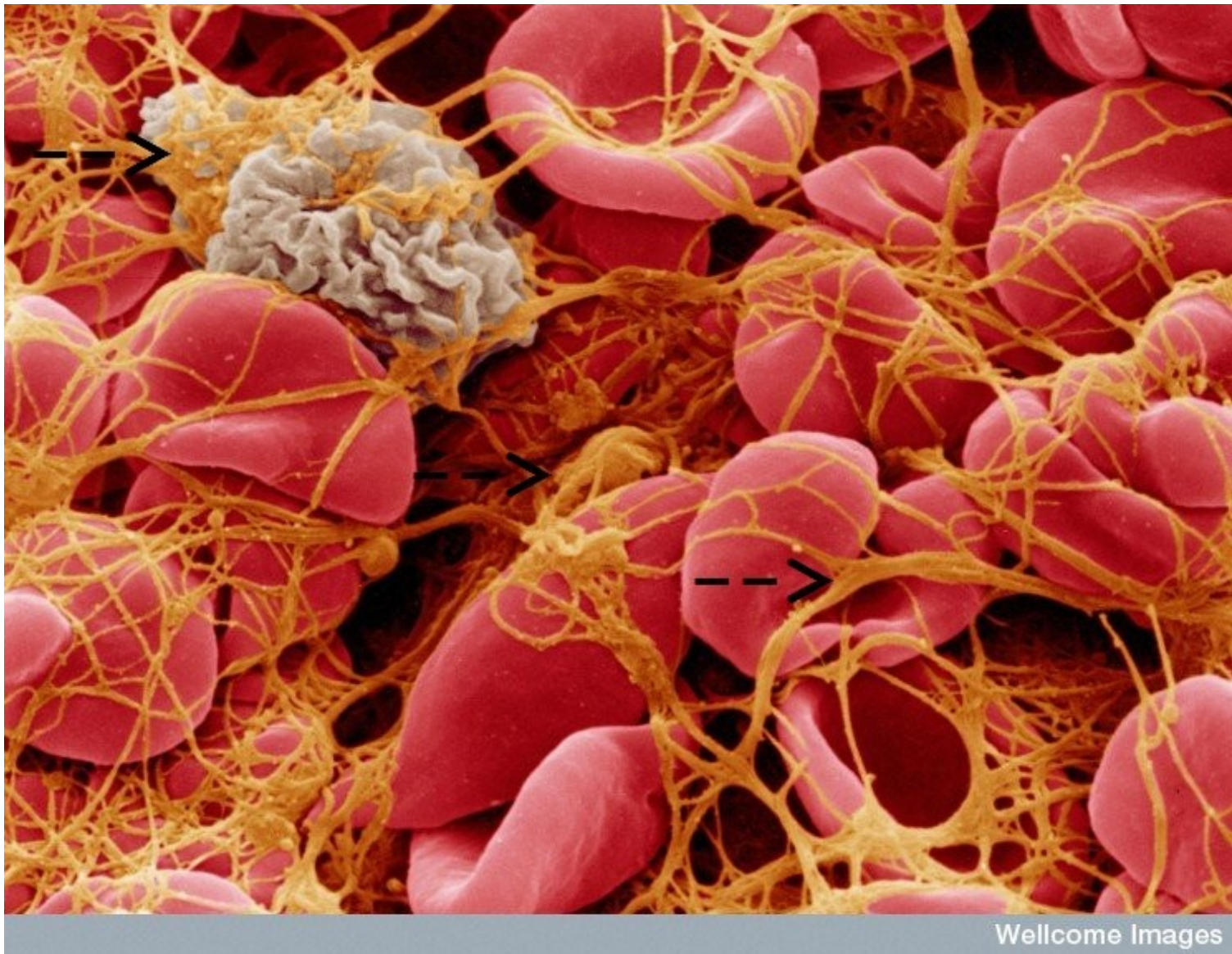




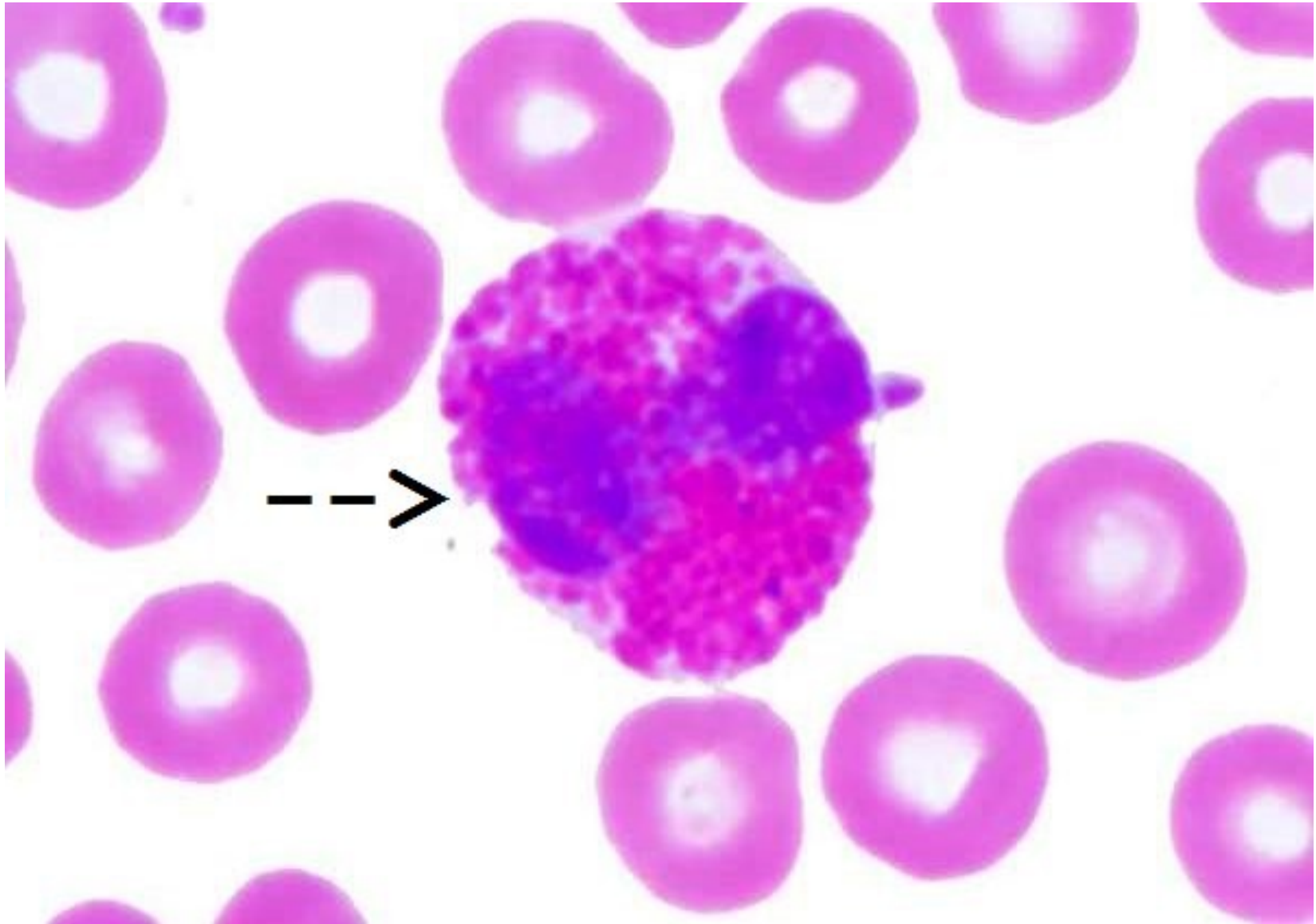
1 Identify the indicated cell



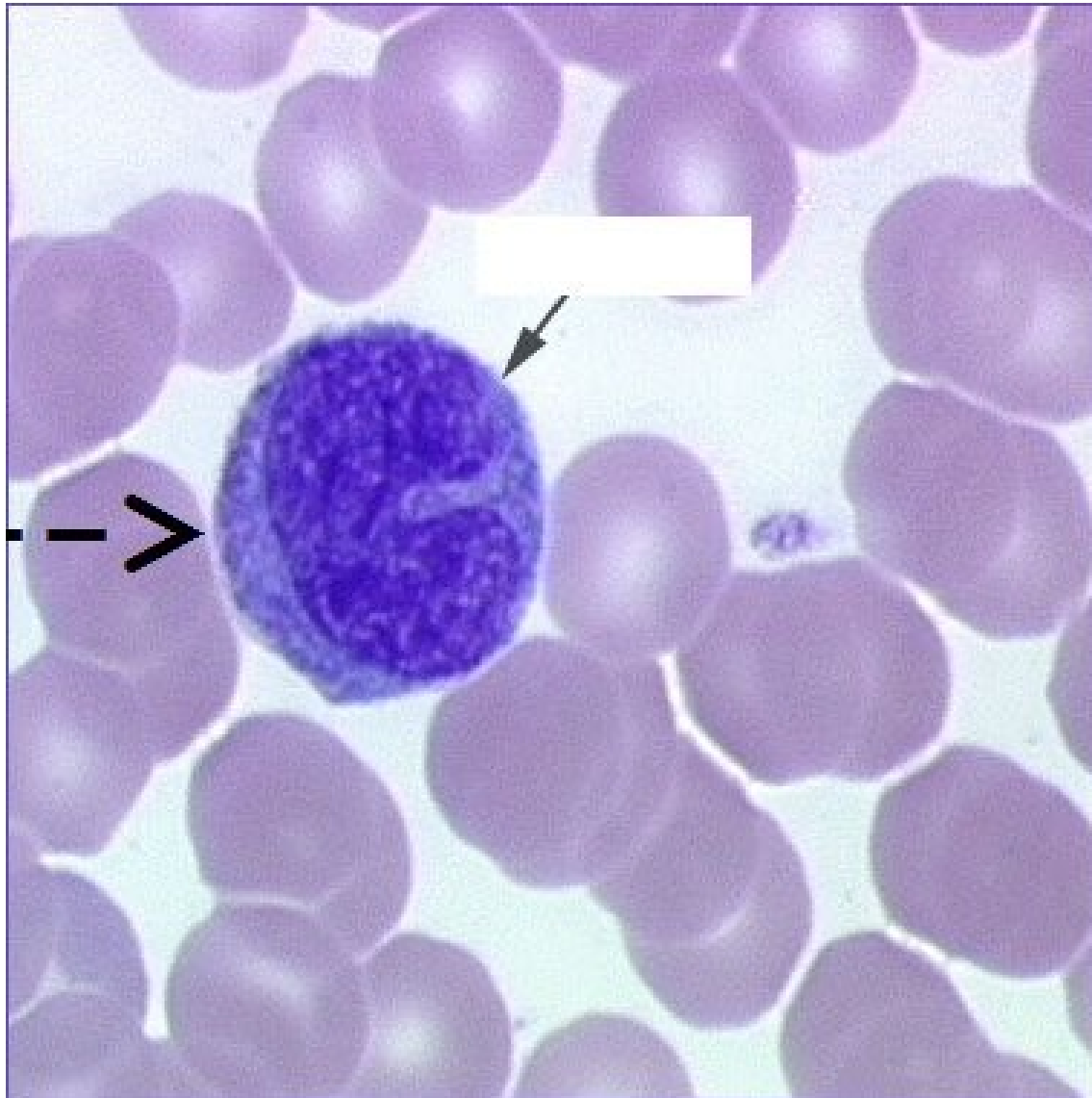
2 what is the function of the indicated yellow structures?



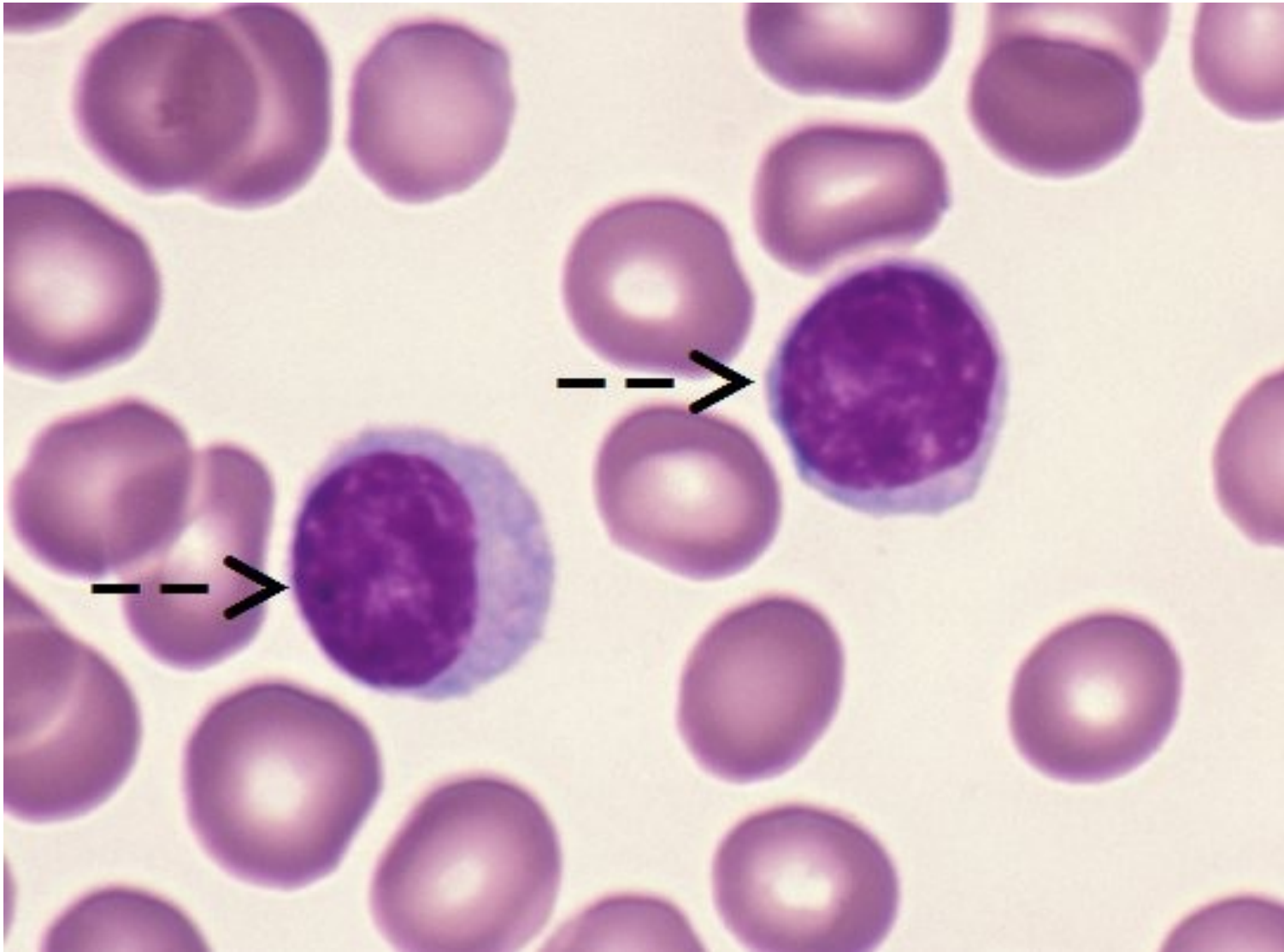
3 Identify the indicated cell



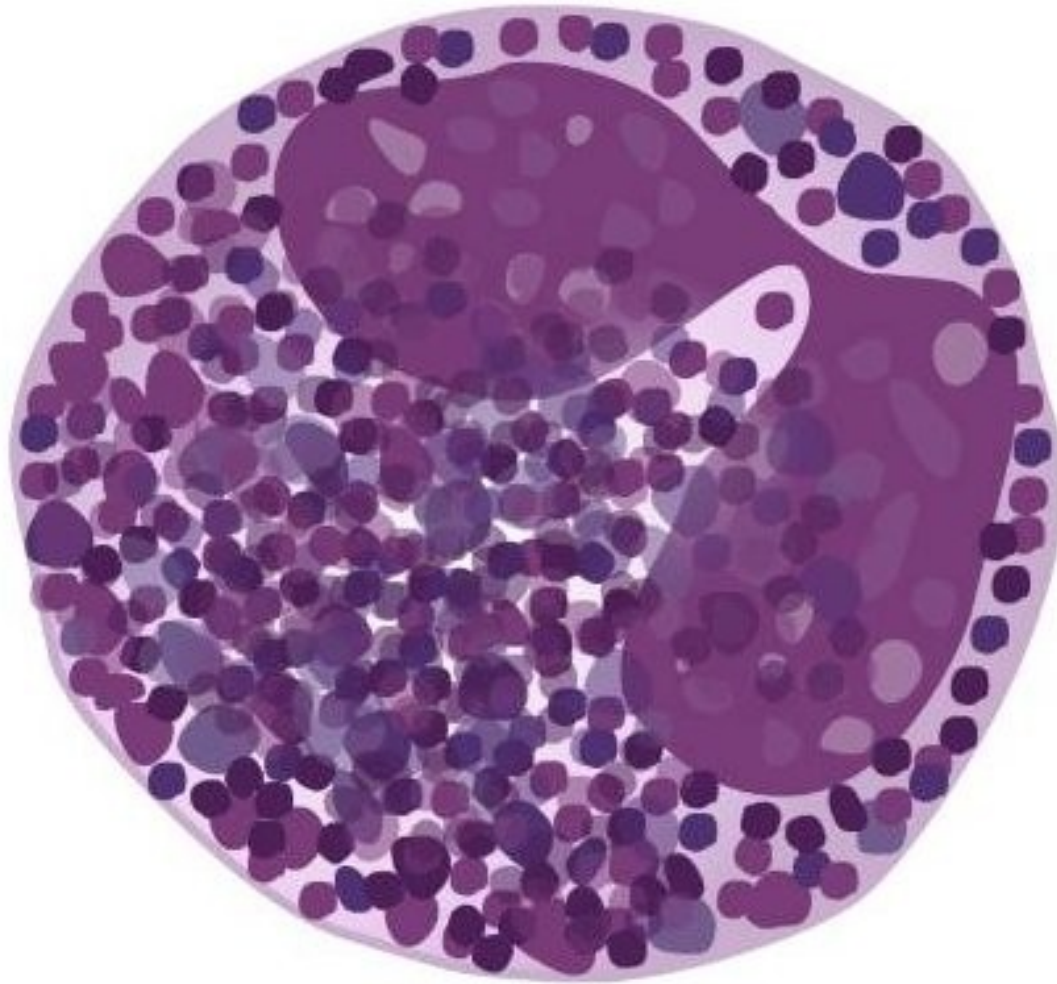
4 what is the function of the indicated cell?



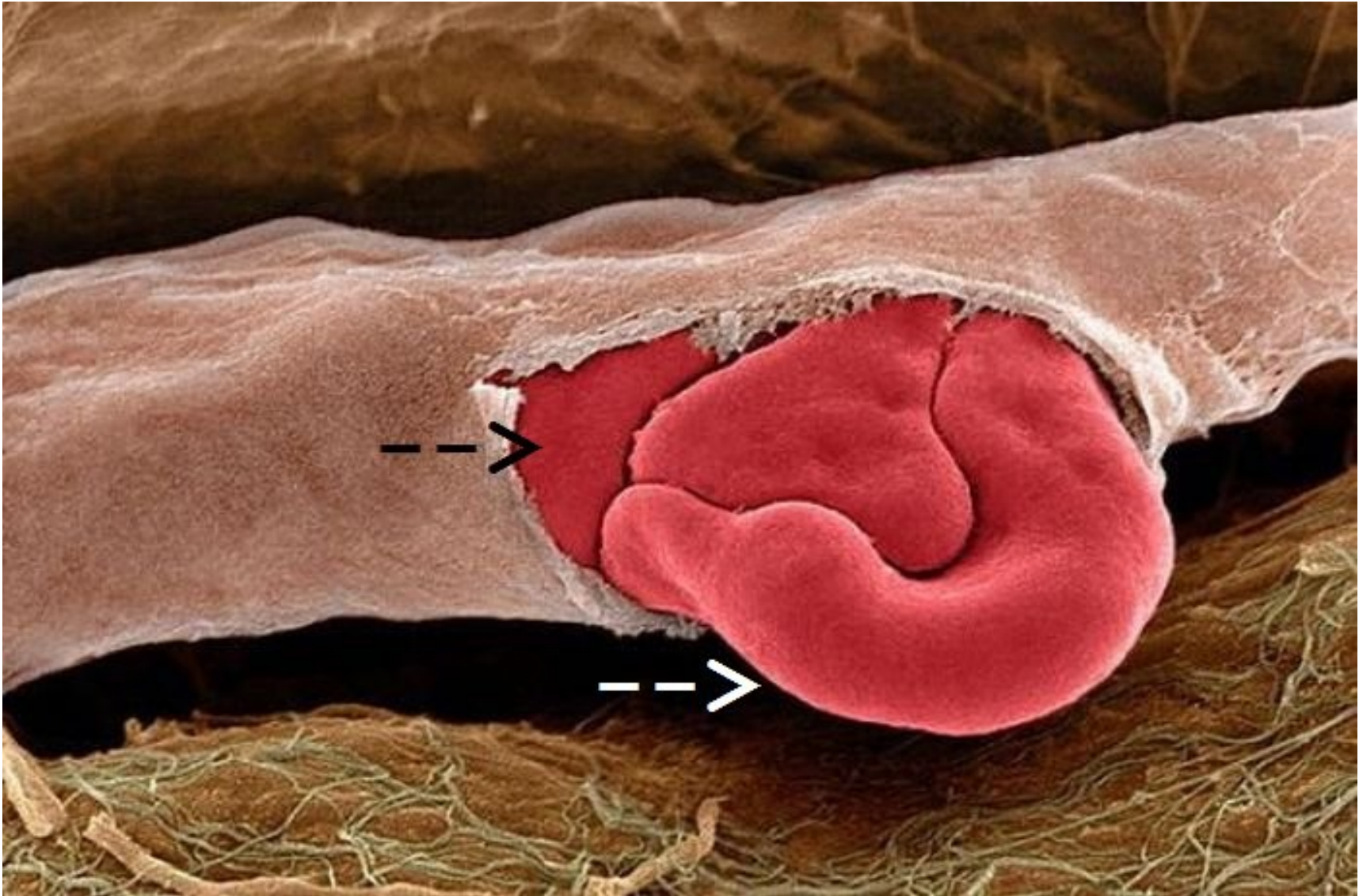
5 Identify the indicated cells



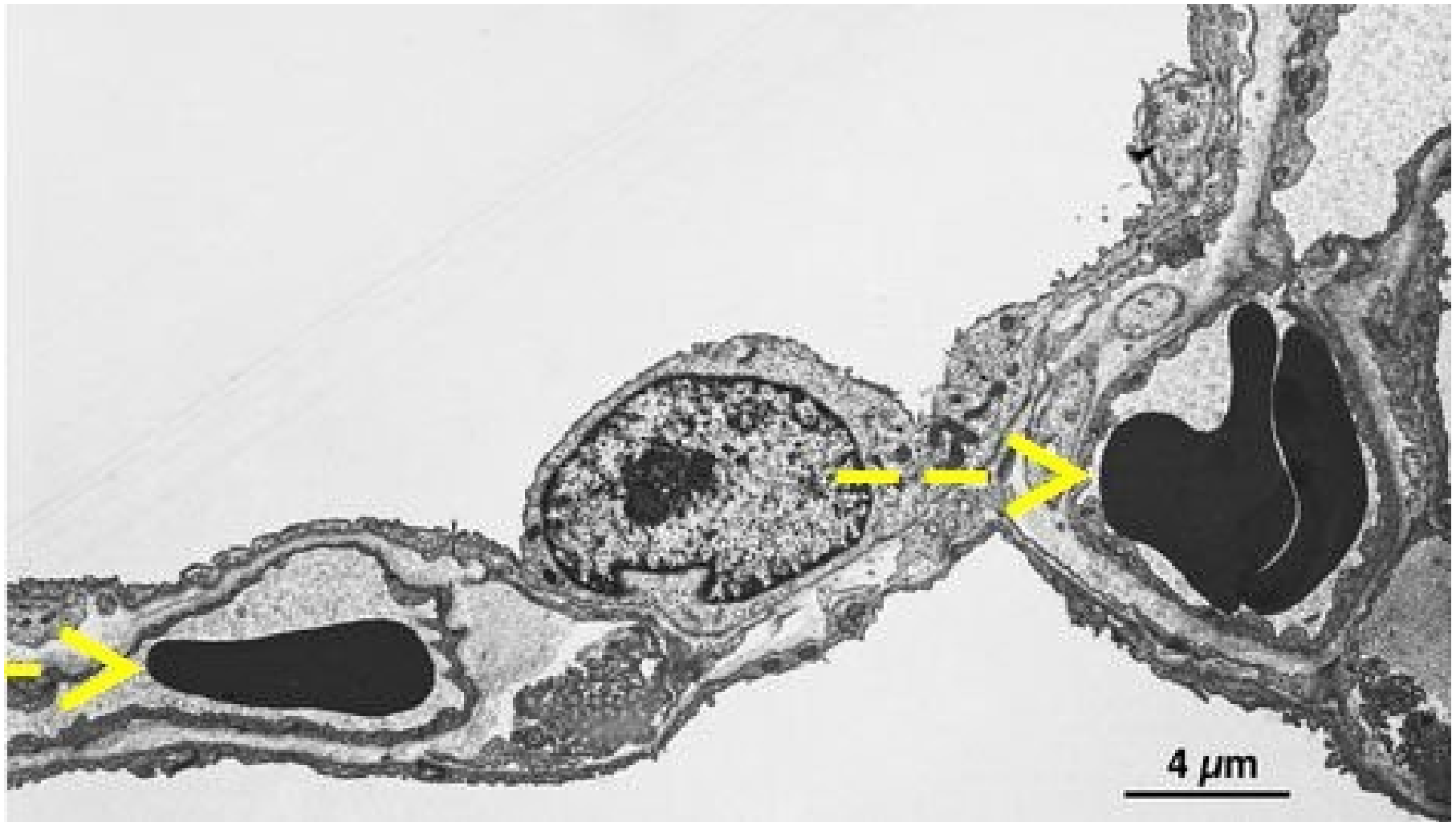
6 what is the function of the cell?



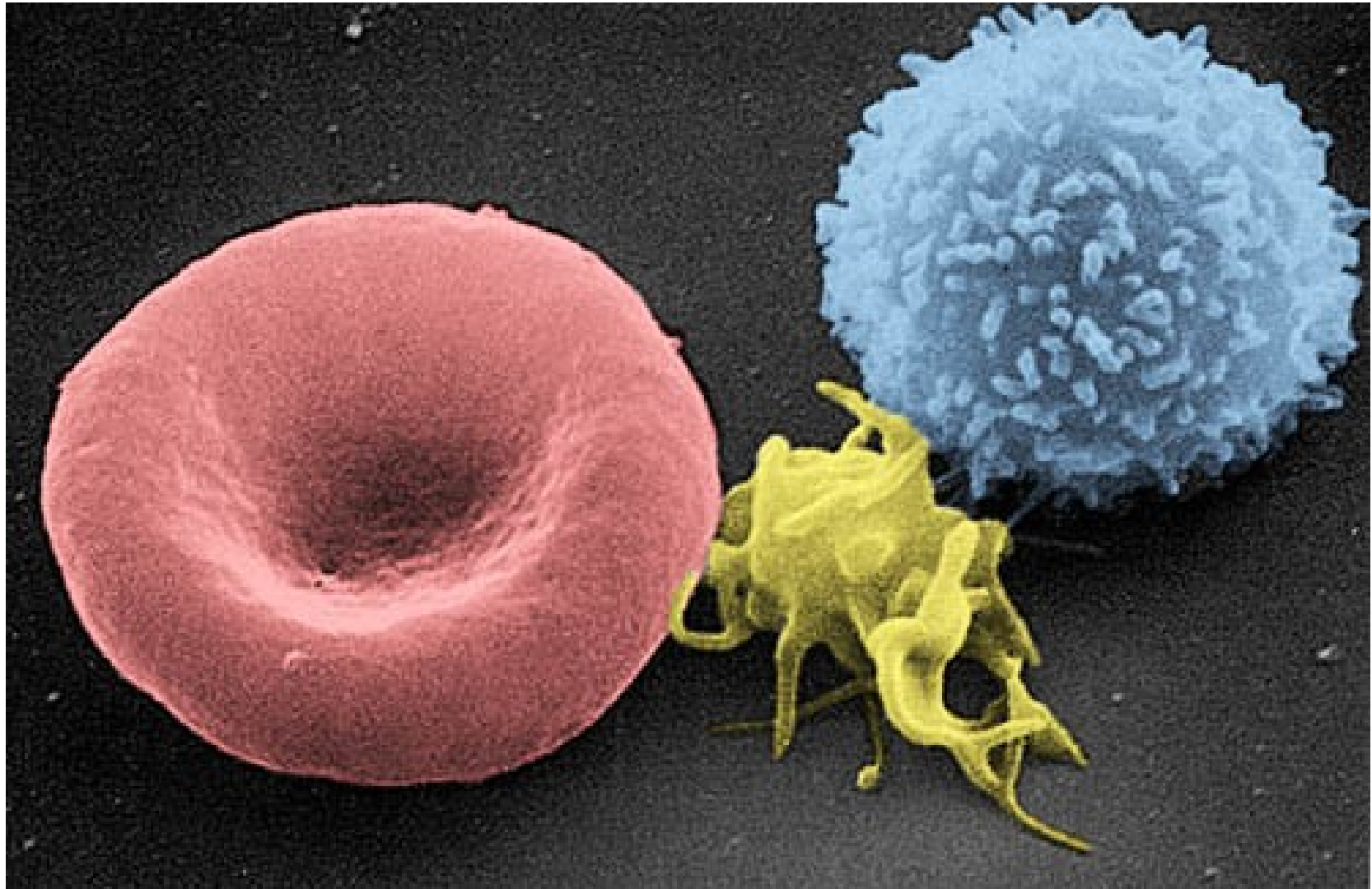
7 Identify the indicated cell



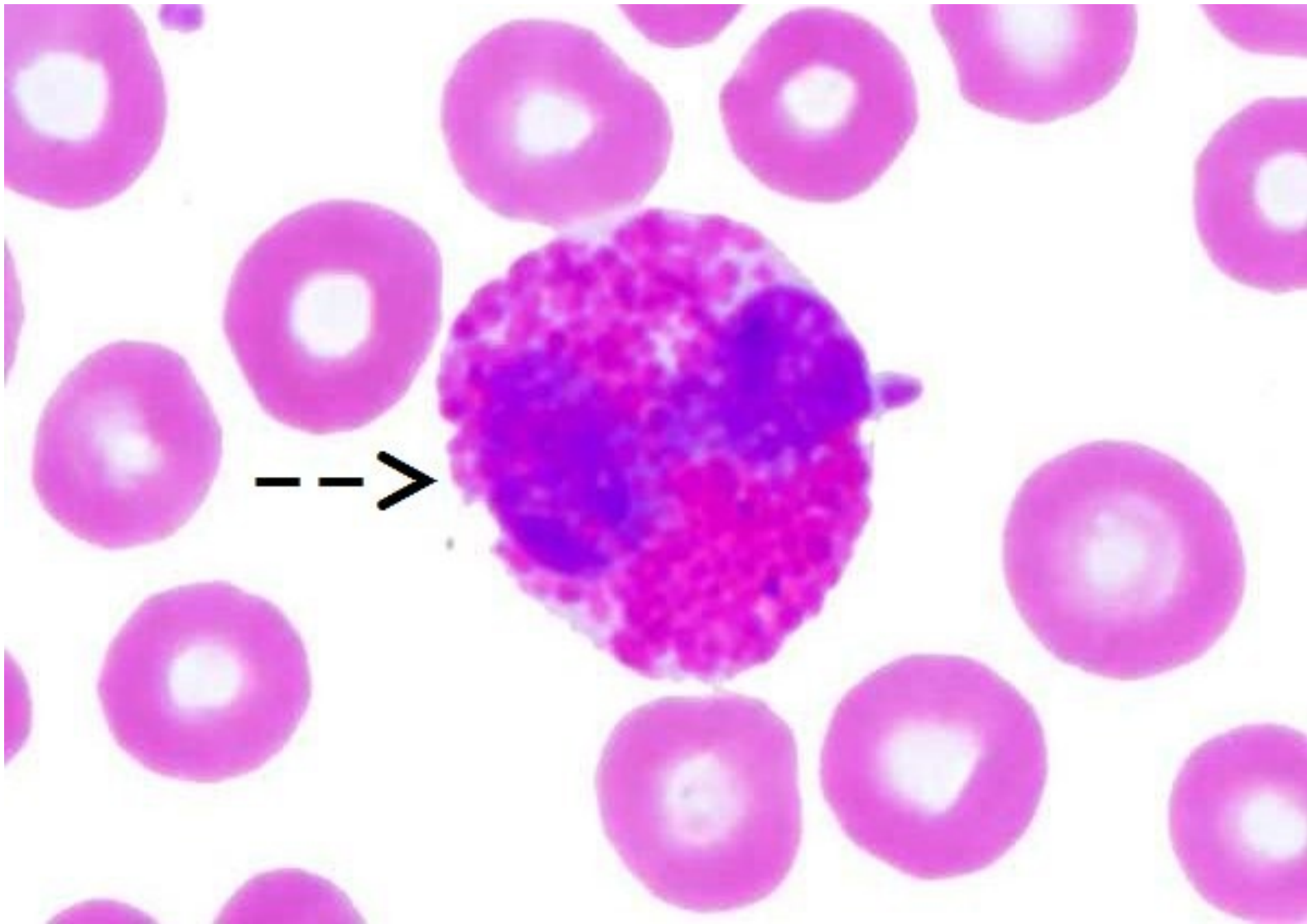
8 what is the function of the indicated cell?



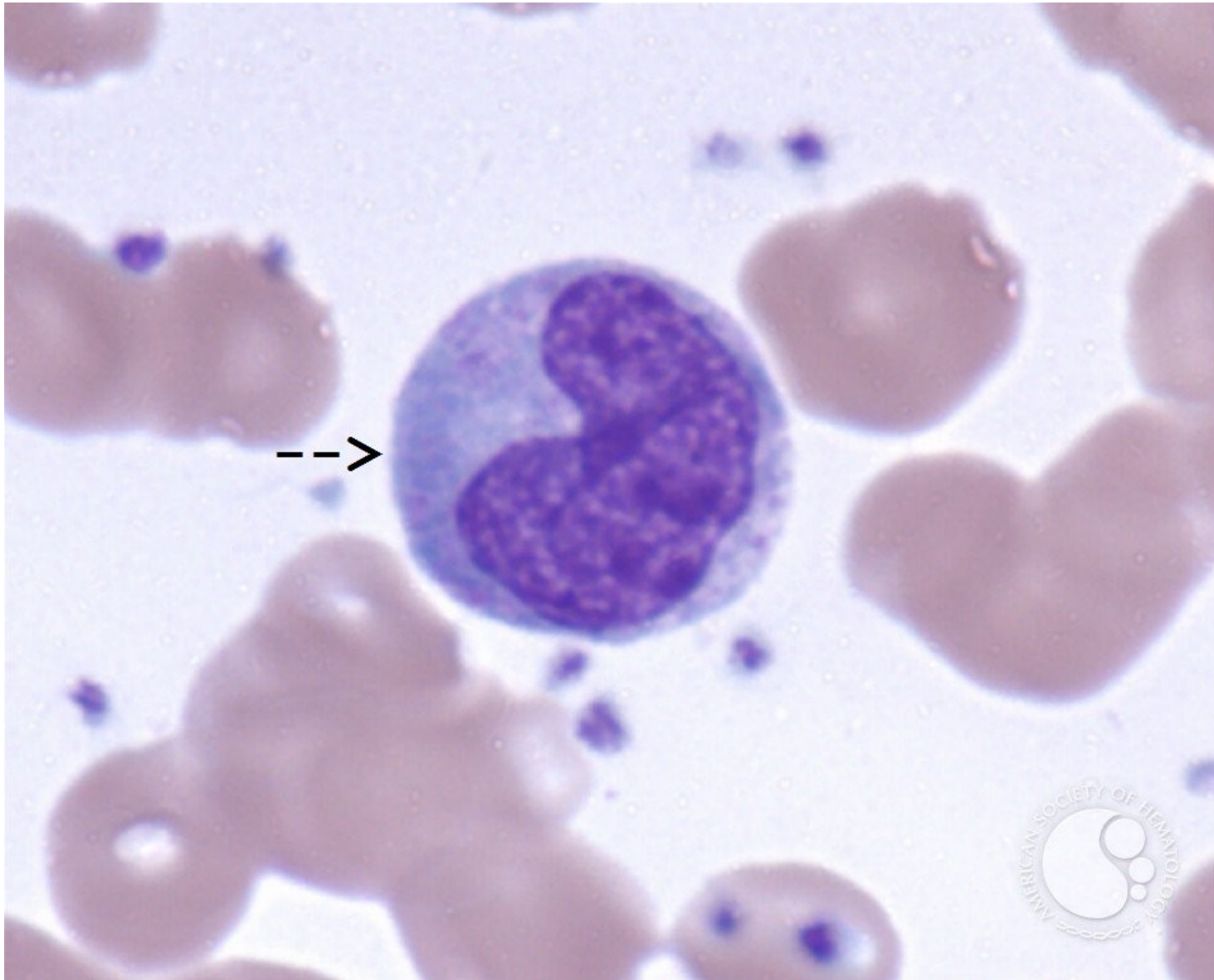
9 Identify the yellow structure



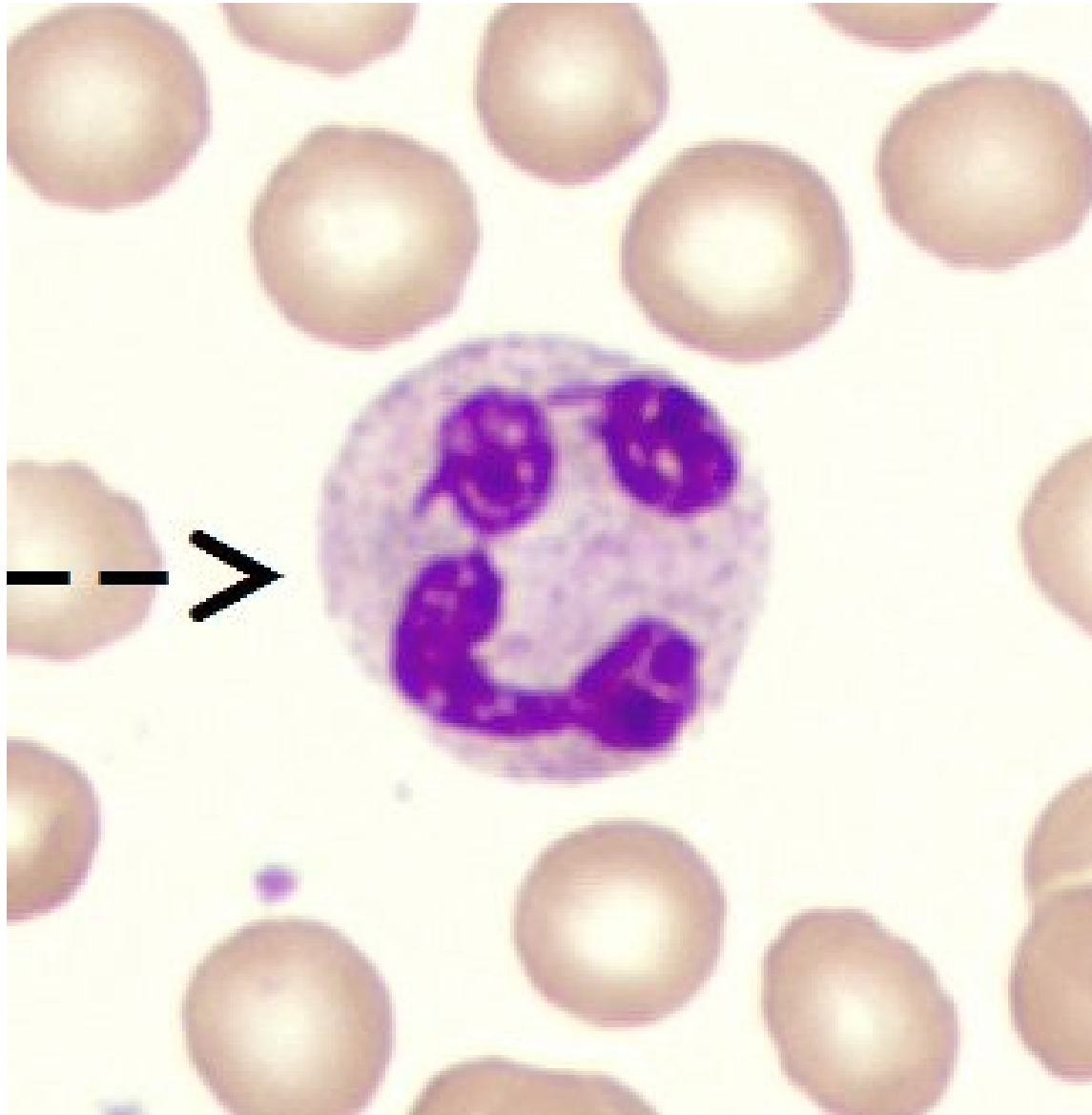
10 what is the function of the indicated cell?



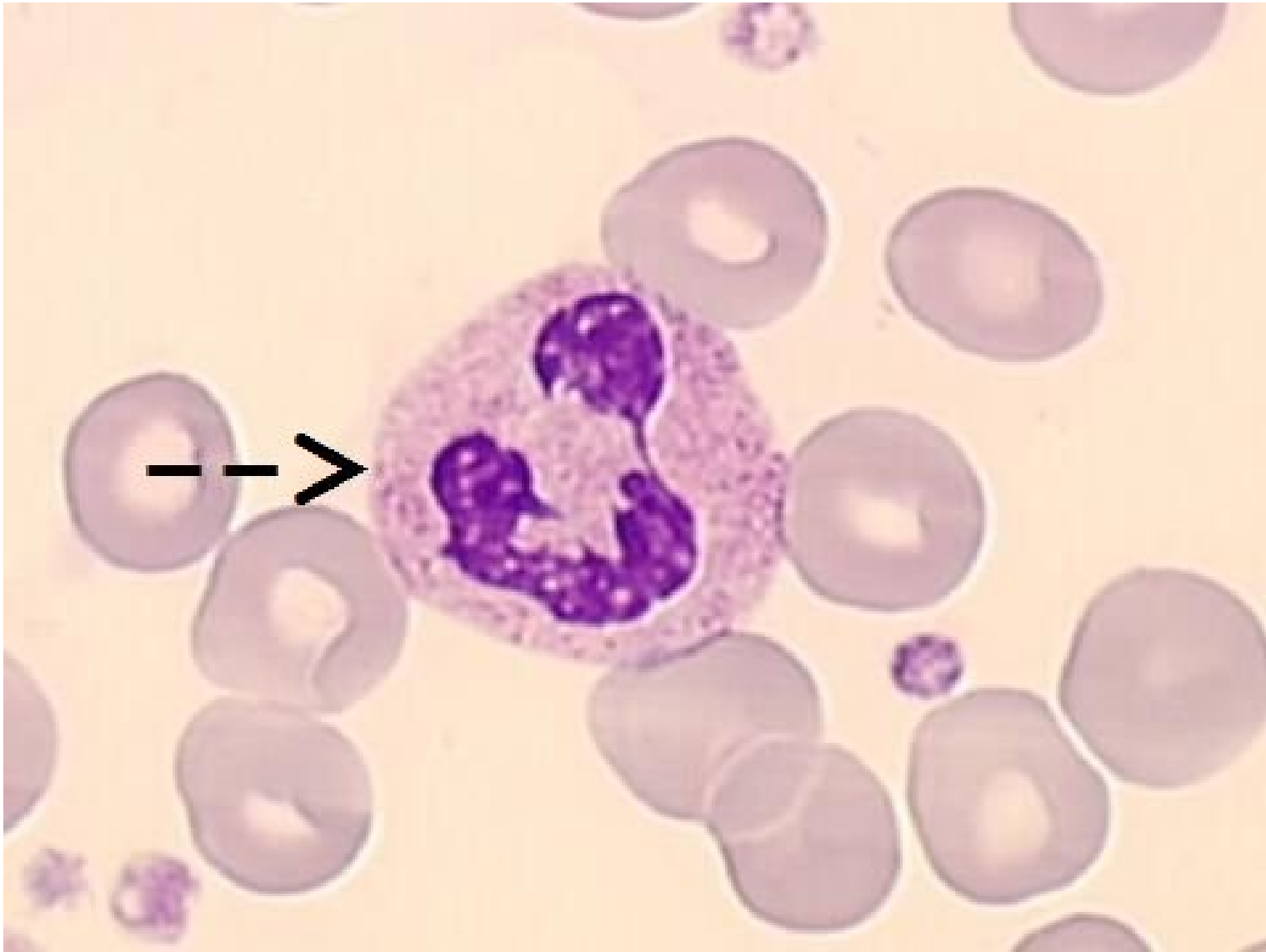
11 Identify the indicated cell



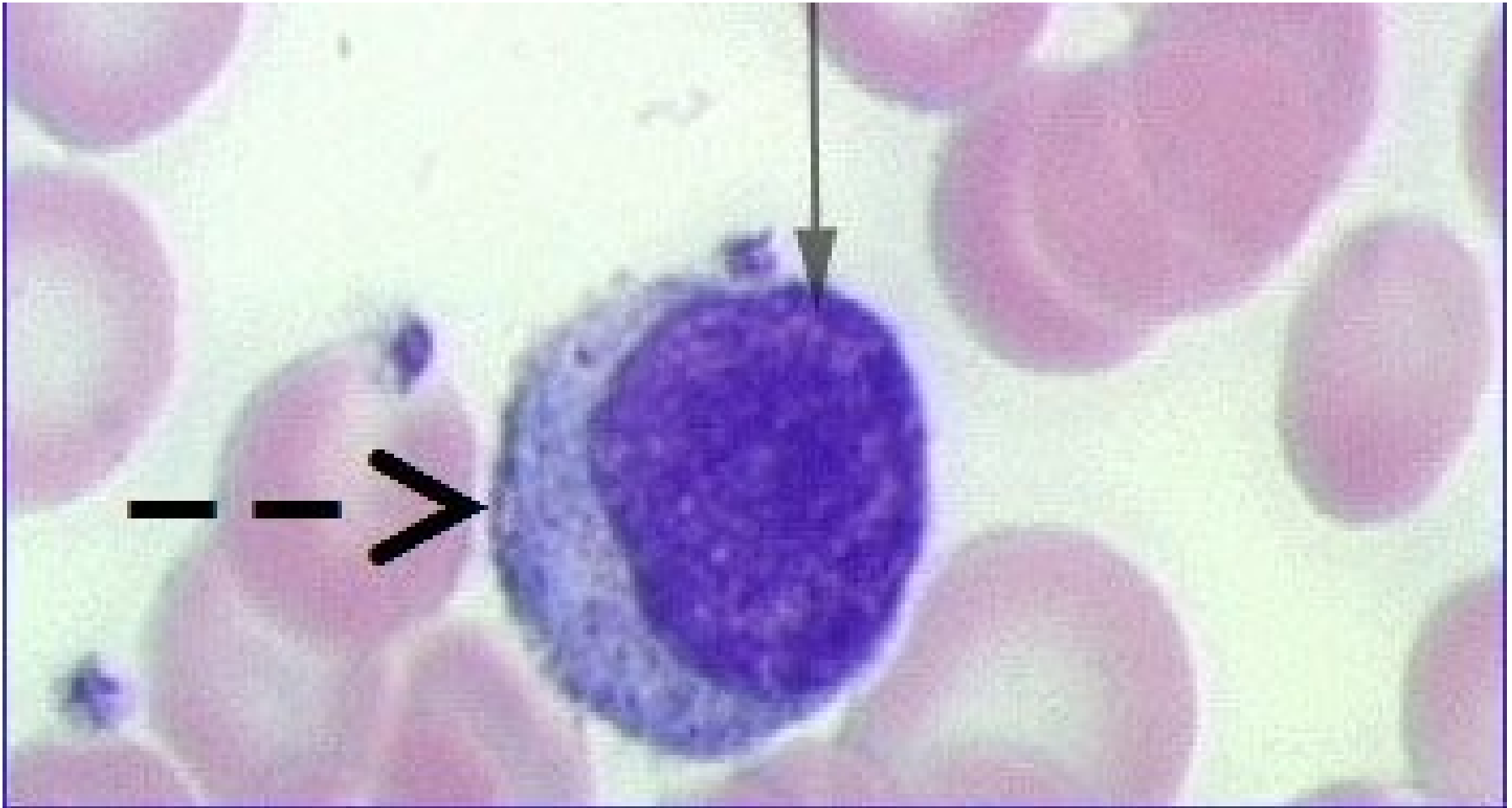
12 what is the function of the indicated cell?



13 Identify the indicated cell



14 what is the function of the indicated cell?



Grade your answers



Community of Truth

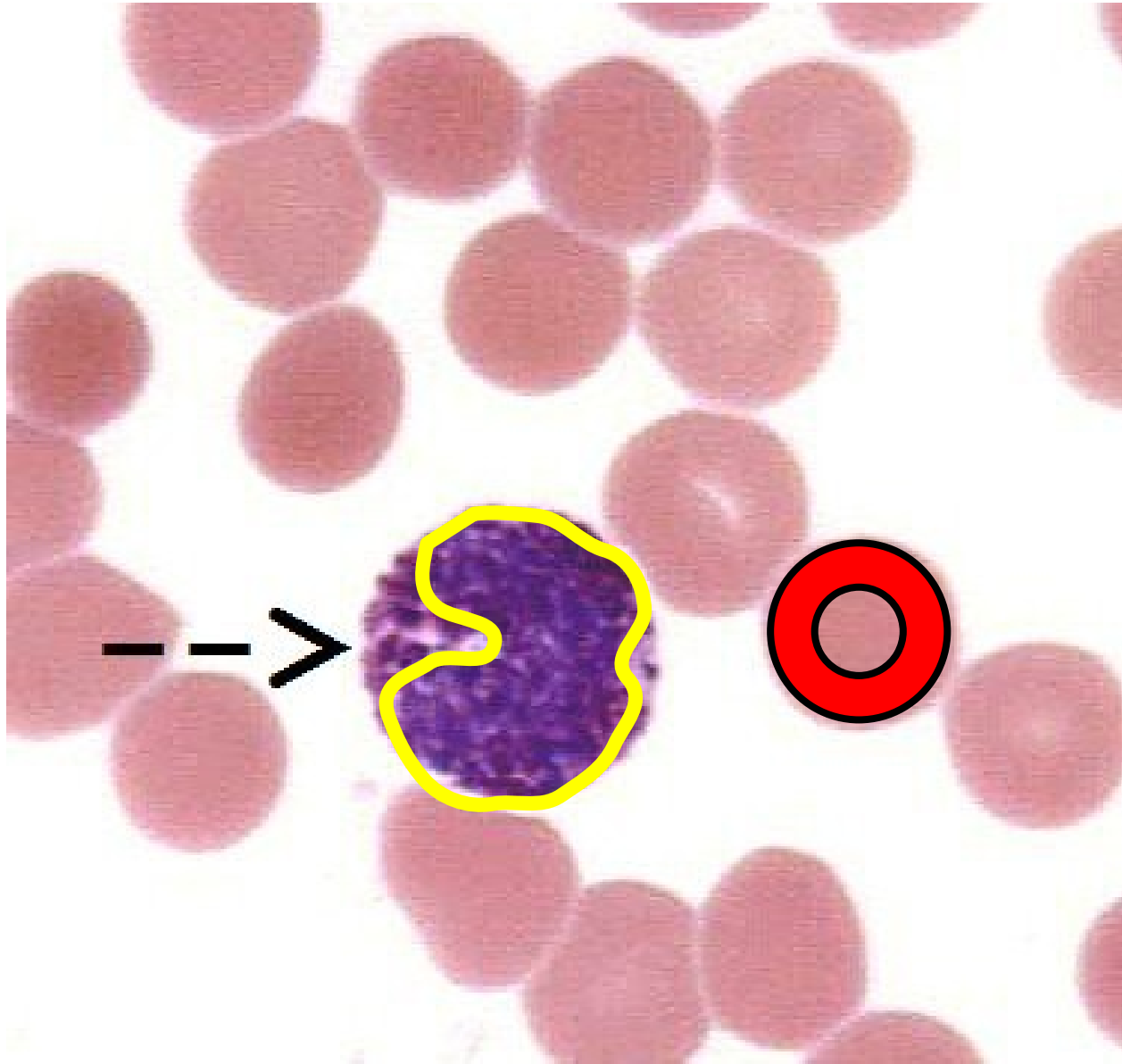
what is my answer?

what is the correct answer?

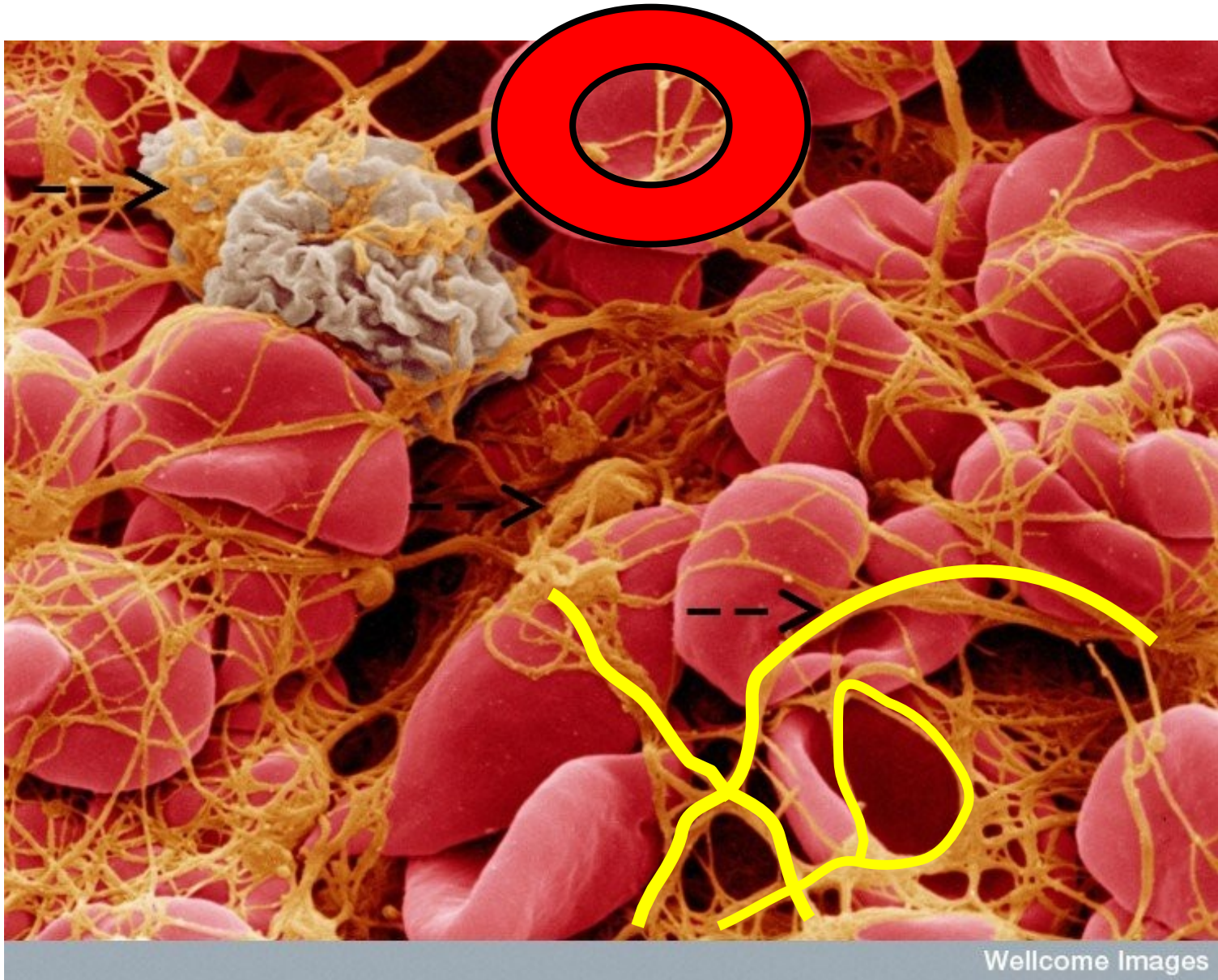
I am am wrong, what was my error?

THUS: Find the truth

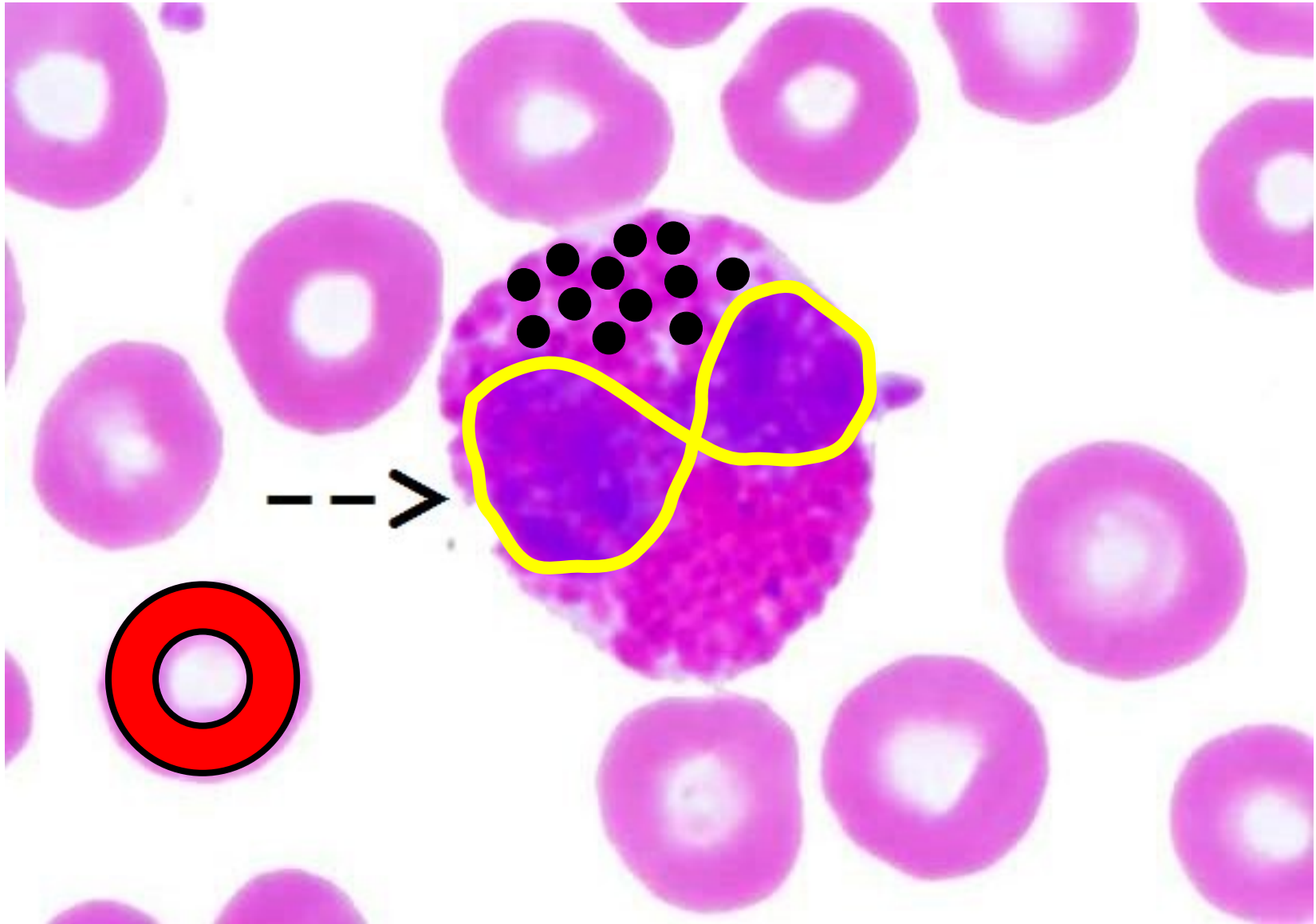
1 Basophil = inflammatory response



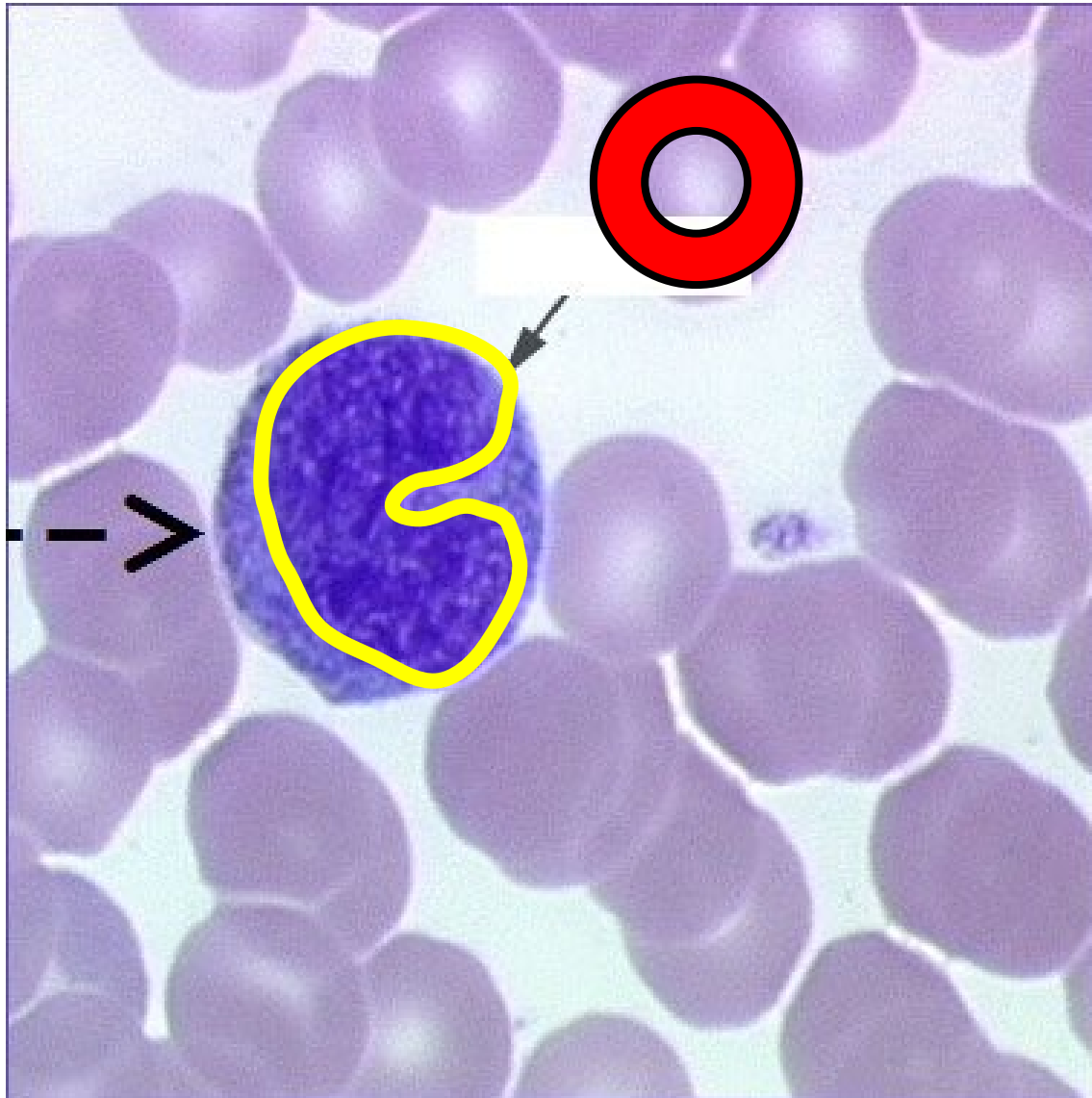
2 Platelets = haemostasis



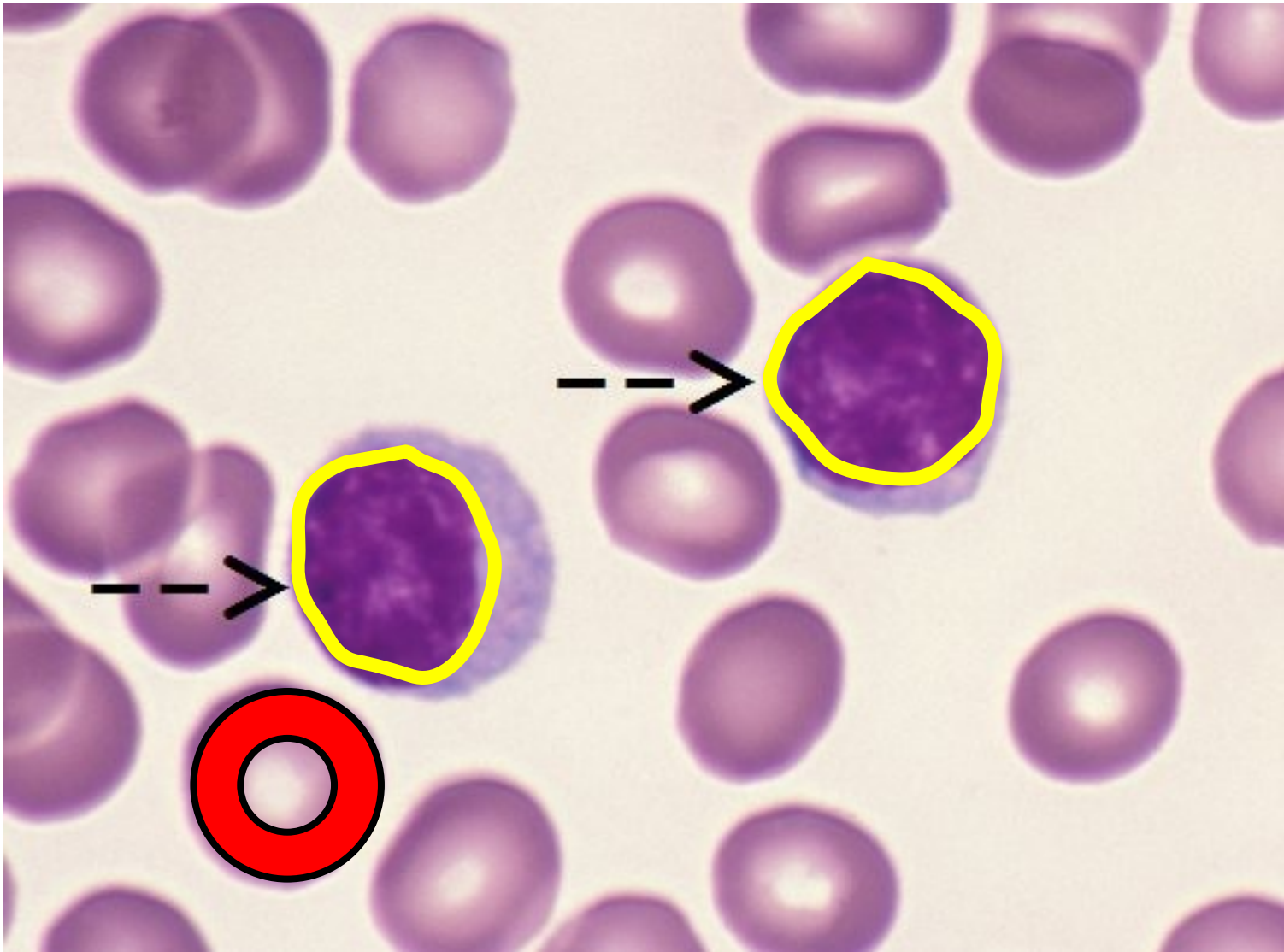
3 Eosinophil = antihistamine



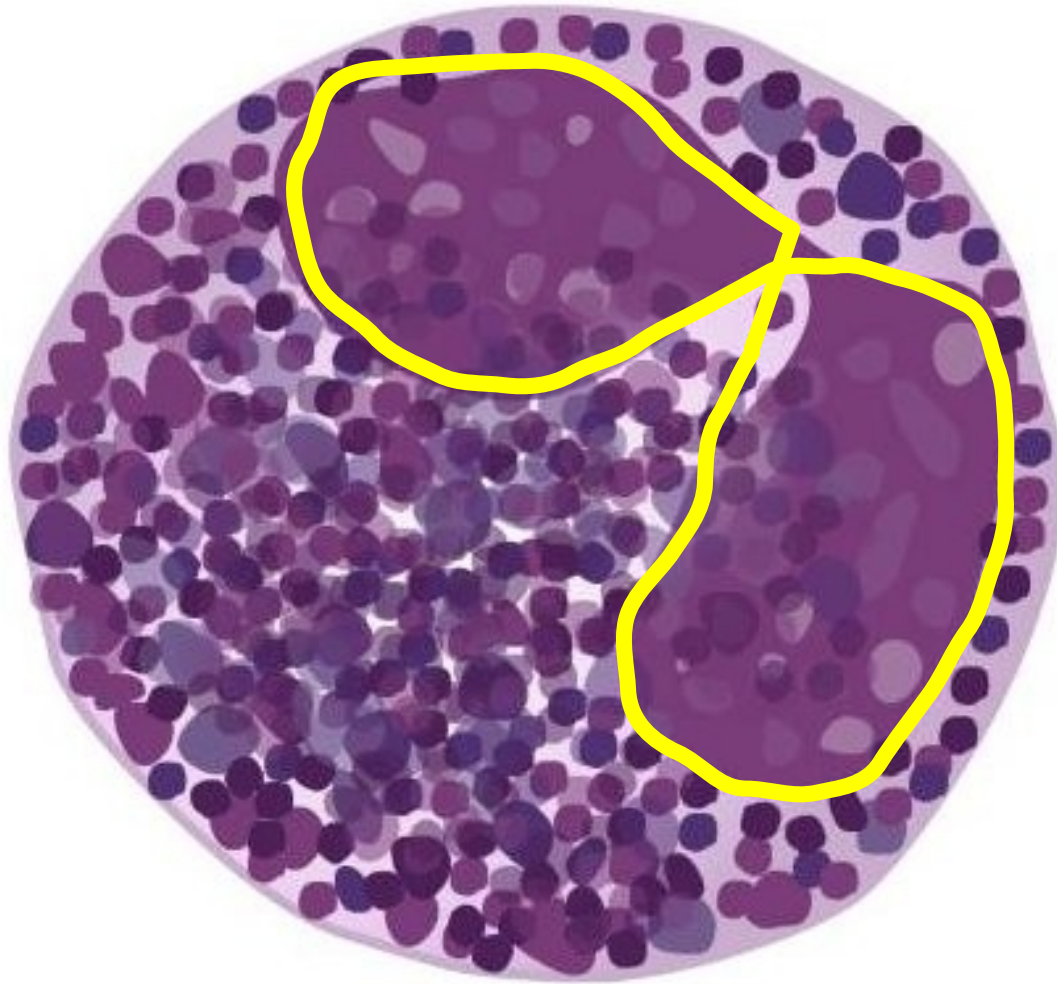
4 Monocyte = phagocytosis = macrophage



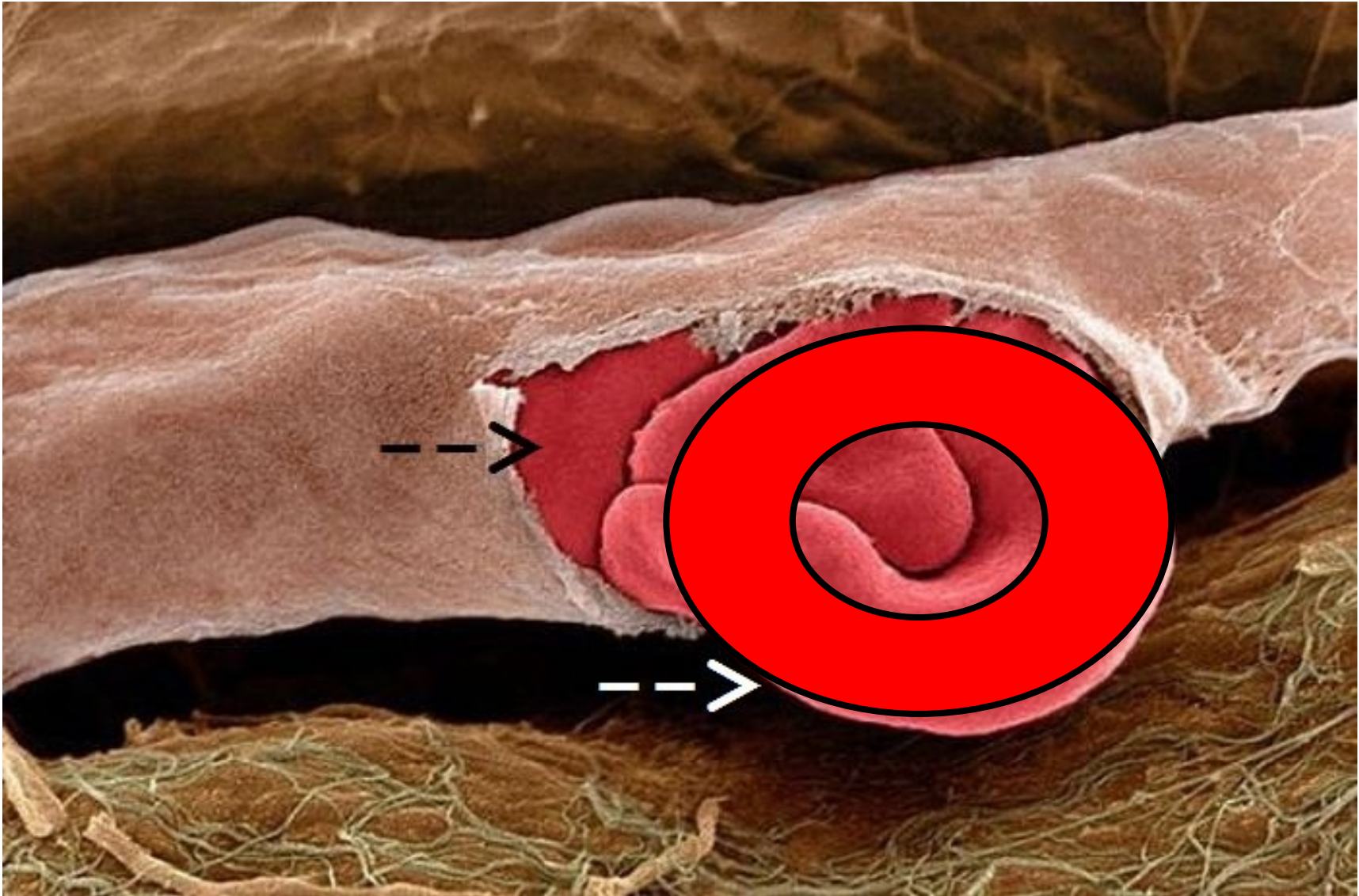
5 Lymphocytes = immunity



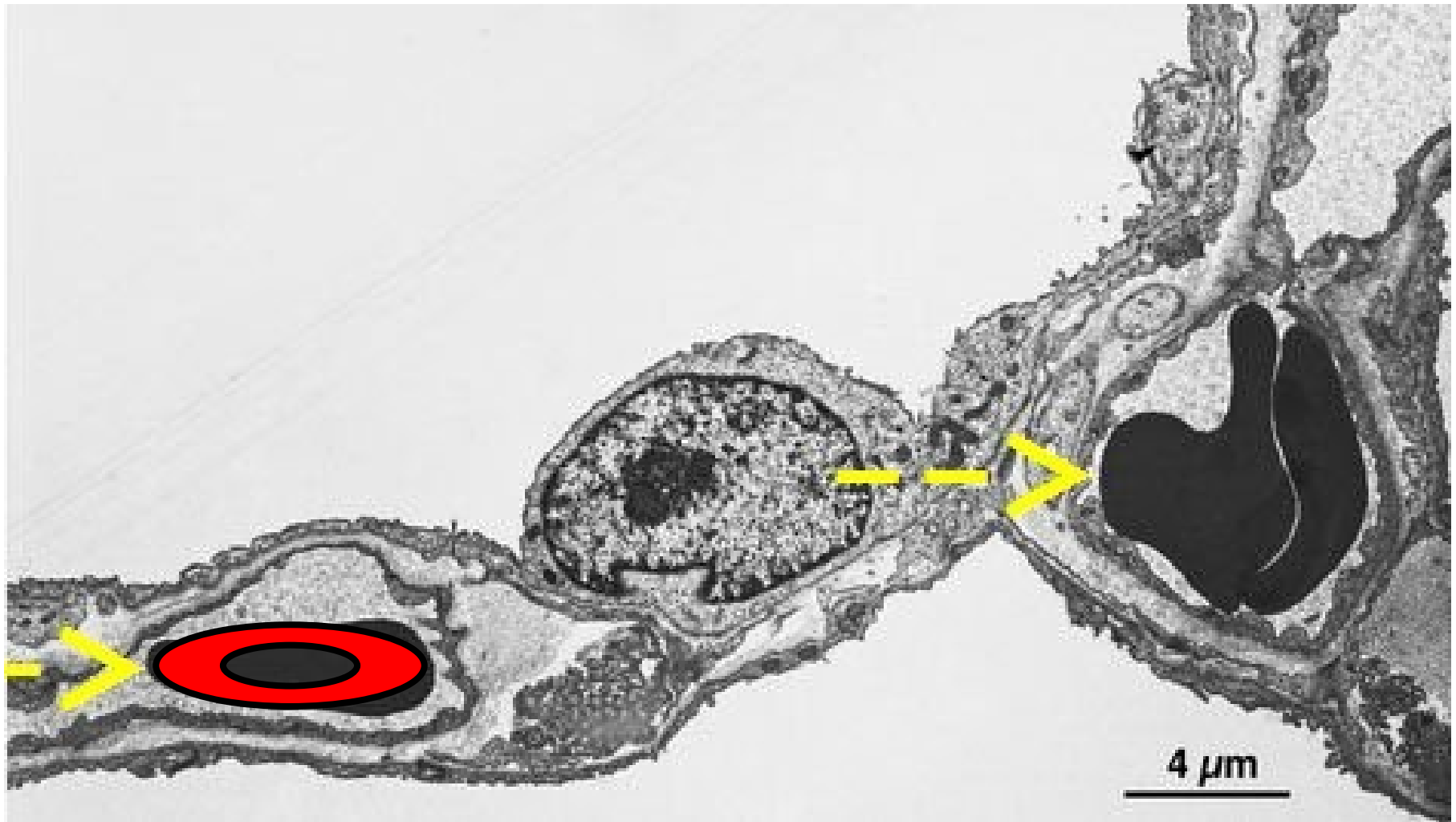
6 Eosinophil = antihistamine



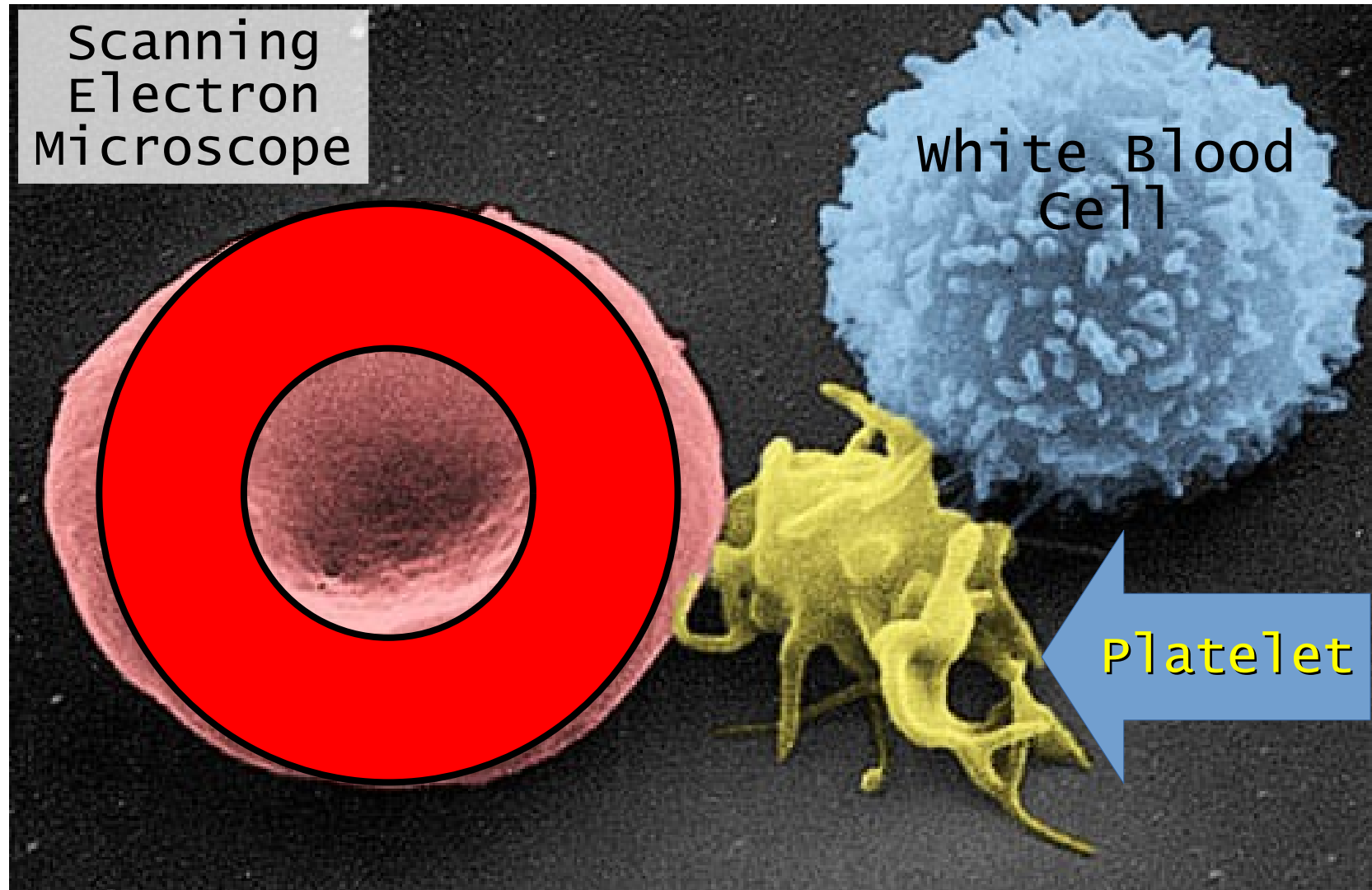
7 Red blood cell = oxygen



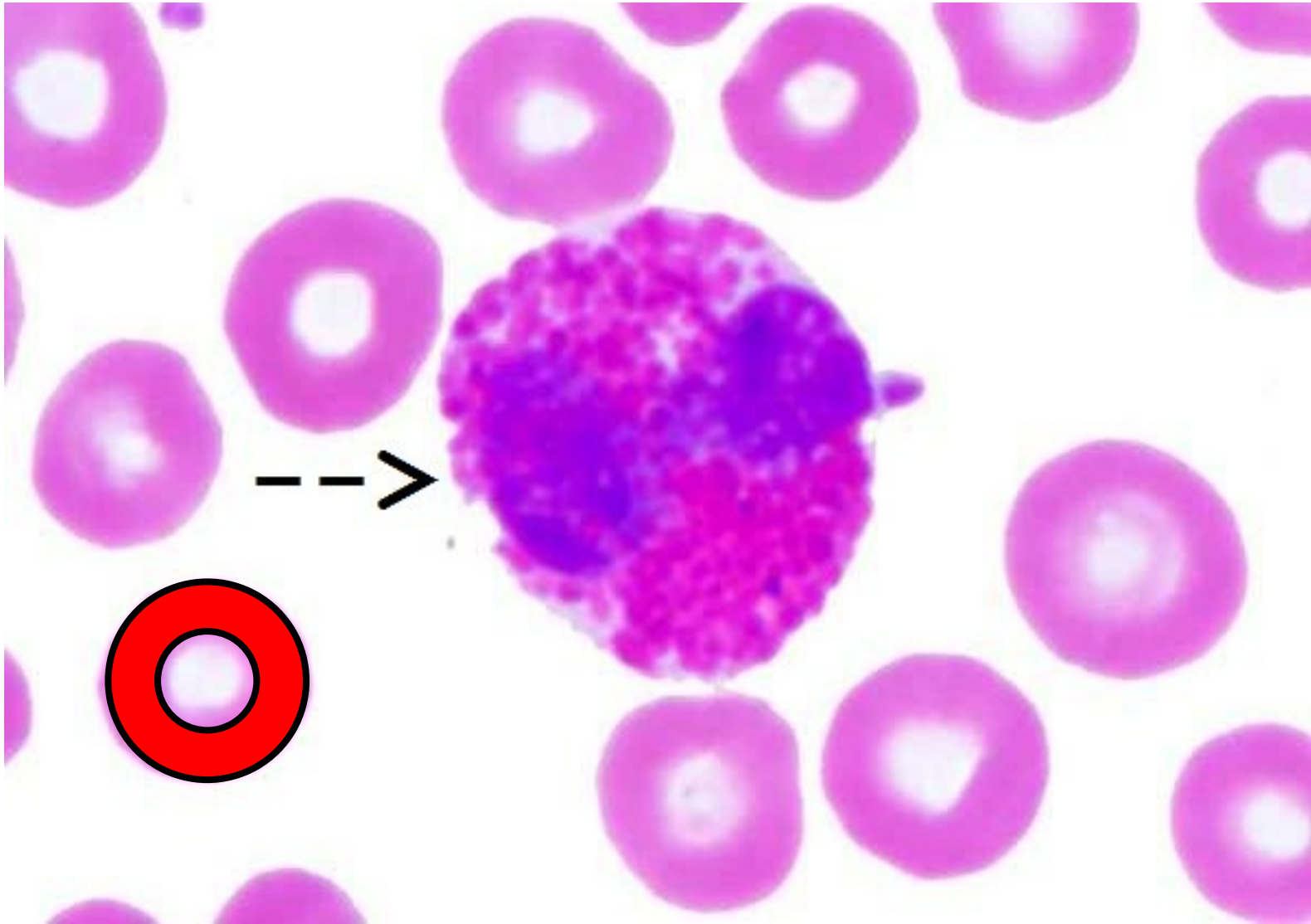
8 Red blood cell = oxygen



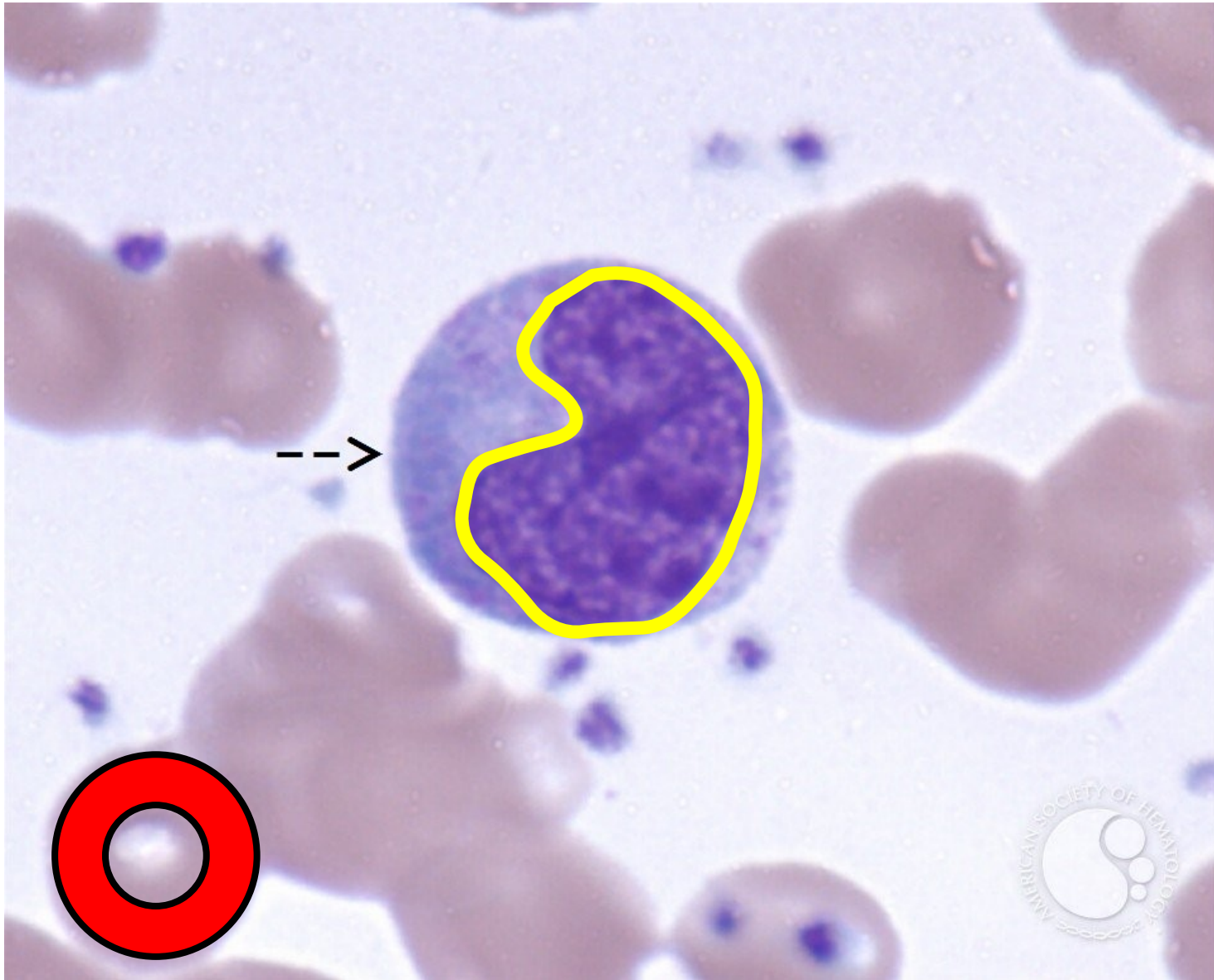
9 Platelet = haemostasis



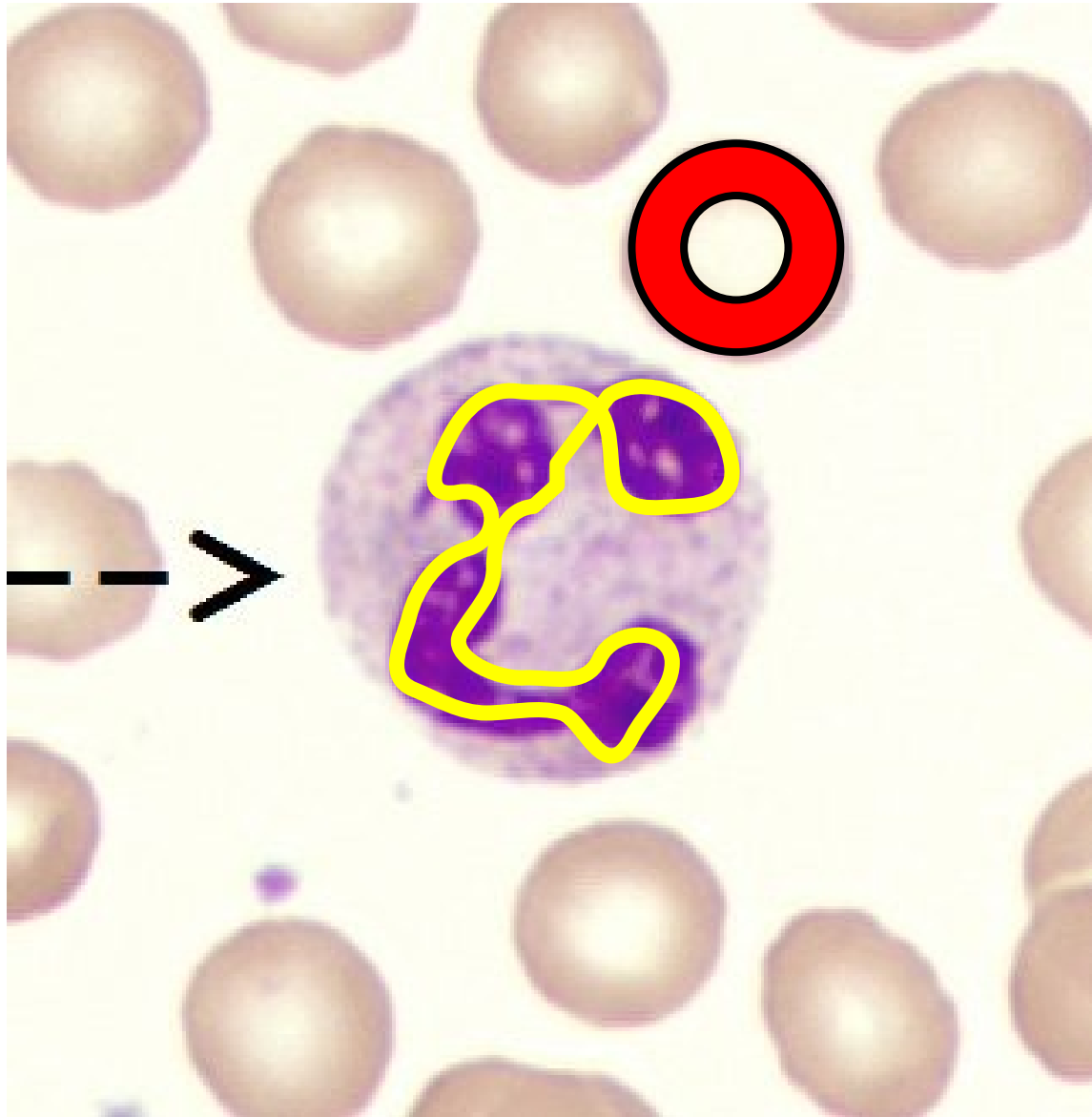
10 Eosinophil = antihistamine



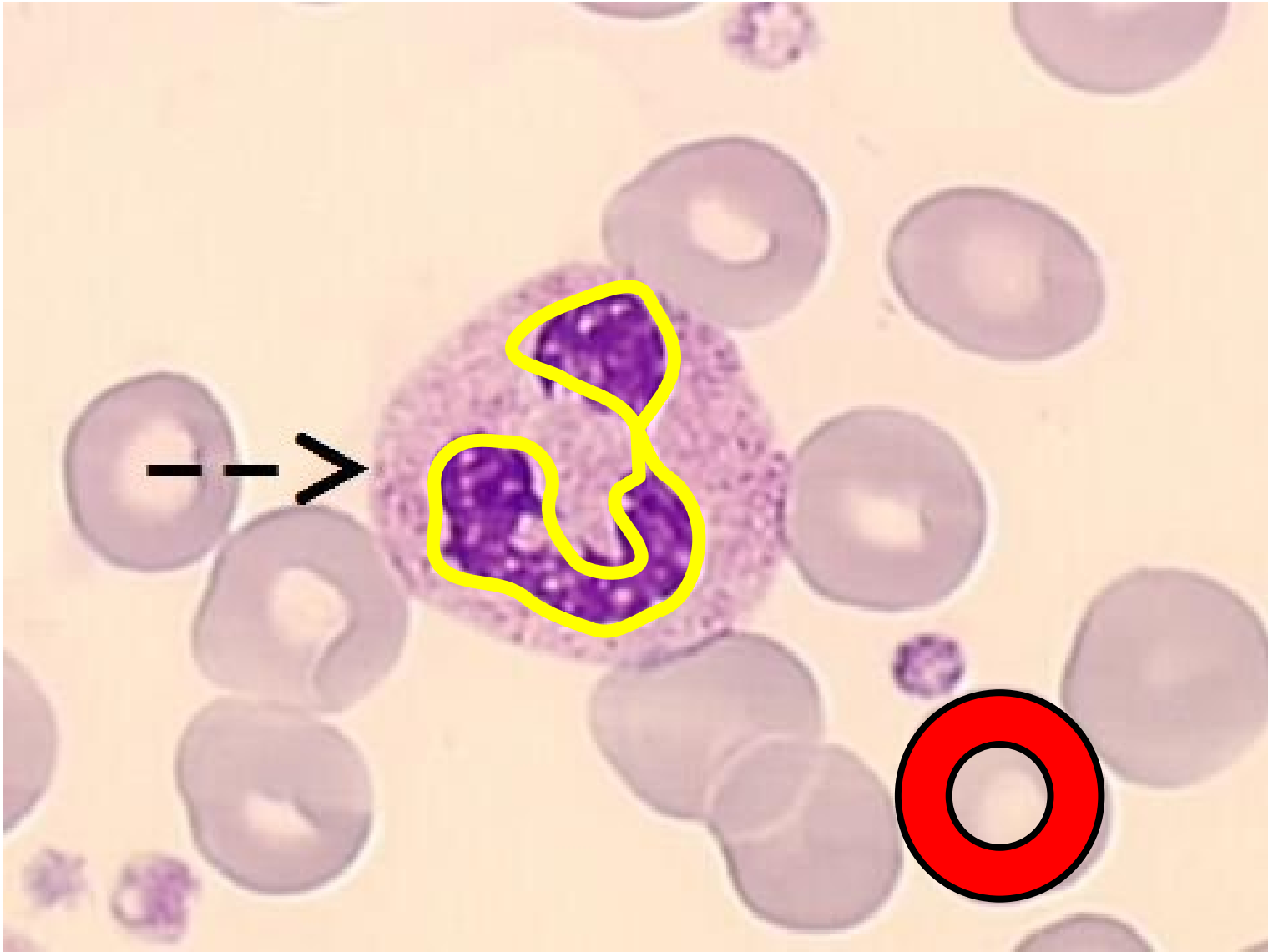
11 Monocyte = phagocytosis = macrophage



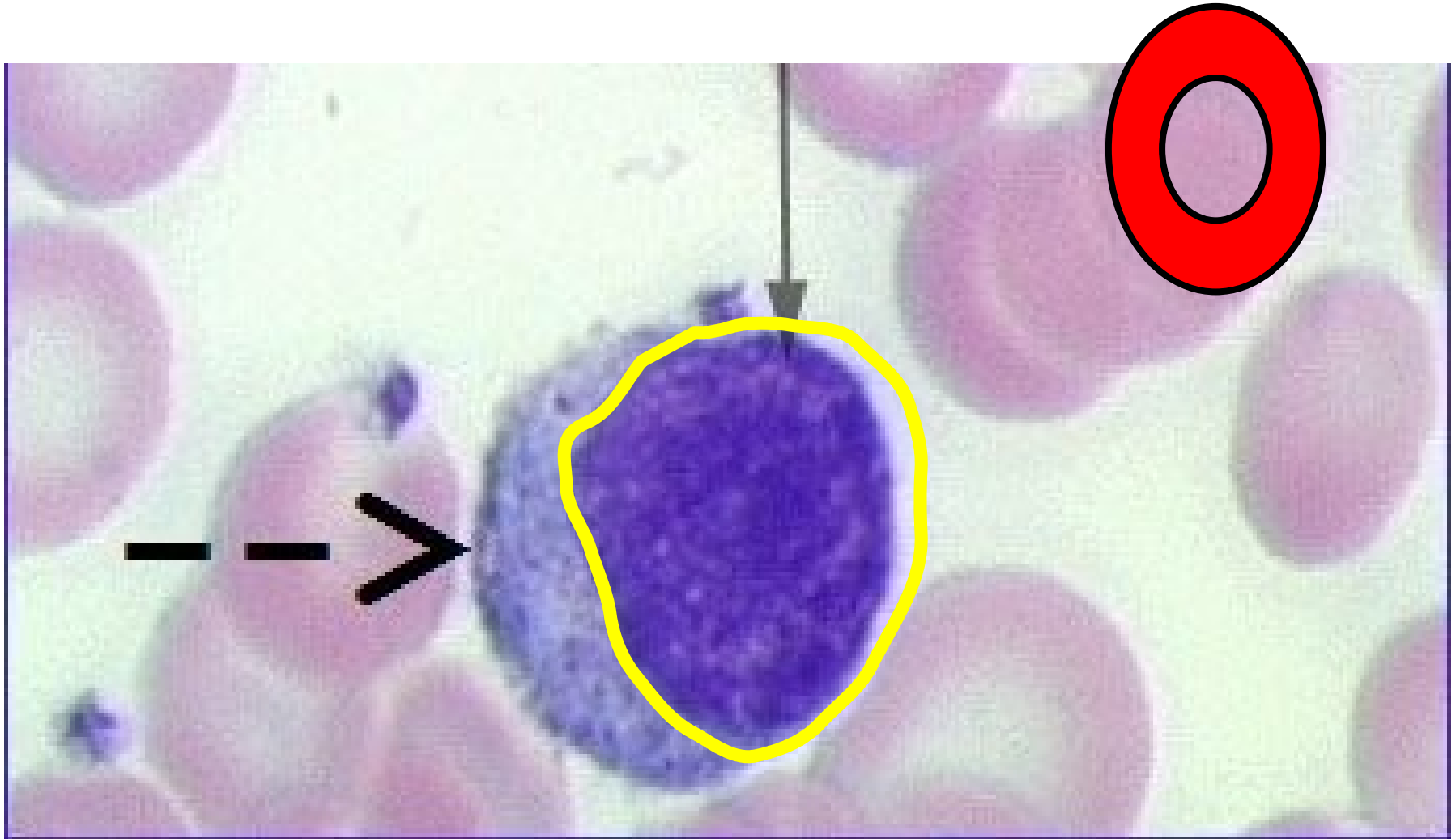
12 Neutrophil = rapid response phagocyte



13 Neutrophil = phagocyte



14 Lymphocyte = immunity



Reflection

Final step:
Are you happy with progress?



Blood cells



Blood

Specialised Connective Tissue

Blood

- Specialised connective tissue
- Formed elements
 - cells
 - Platelets
- Suspended in fluid intercellular material
 - Plasma
- Circulates and transport
 - Nutrients
 - Waste products
 - Hormones
 - Proteins
 - Electrolytes

Blood regulates

- Body temperature
- Osmotic balance
- Acid-base balance

Blood cells

- Short life span
- Continuously replaced
- Hemopoiesis

Theory!

Red blood cells

- Also erythrocytes
- Round biconcave disk
- 7 – 8 μm diameter
- Mature RBC lacks nucleus
- Transport oxygen & carbon dioxide
- High partial pressure oxygen
- Oxyhemoglobin
- High partial pressure carbon dioxide
- Carboxyhemoglobin
- Carbon monoxide
- Also binds – stronger than oxygen

Platelets

- Membrane covered fragments of cytoplasm
- Round to oval fragments of megakaryocytes
- 2 – 4 μm diameter
- Coagulation of blood by aggregation and clot formation

Neutrophils

- Round
- 9 – 12 μm diameter
- Nucleus stains dark blue
 - Segmented/lobulated nucleus
 - 3 – 4 lobes connected thin threads chromatin
- Cytoplasm stains light pink
- 40 – 75% (ranges vary between sources)
- Granules
 - 0.1 – 0.5 μm diameter
 - Doesn't stain well at neutral pH
- Recognise & phagocytosis bacteria

Eosinophils

- Round
- 10 – 14 μm diameter
- Nucleus stains brownish-black
 - Bilobed nucleus
- Cytoplasm obscured by granules
- 1 – 6% (ranges vary between sources)
- Granules stain reddish-orange
 - 0.5 – 1 μm diameter
- Inactivate and kill parasites

Basophils

- Round
- 8 – 10 μm diameter
- Nucleus stains light blue
 - U/S-shaped nucleus
 - Obscured by large dark granules
- Very little cytoplasm
- 0 – 1% (ranges vary between sources)
- Granules
 - 0.5 – 1.3 μm diameter
 - Strong basophilic
 - Similar to mast cells
- Release histamine
- Cell-mediated immunity – extremes = anaphylactic shock

Lymphocytes

- Round to oval
- Small = 8 – 10 μm diameter
- Medium/Large = 12 – 18 μm diameter
- Acentric nucleus stains dark blue
- Small
 - Thin rim of light blue cytoplasm
- 20 – 45% (ranges vary between sources)
- Large
 - oval nucleus
 - More cytoplasm
- Primary cell-mediated & humoral immunity

Monocyte

- Largest
- 12 – 15 μm diameter
- Nucleus
 - Acentric
 - kidney shaped
 - Course heterochromatin
- Cytoplasm stains greyish-blue
- 2 – 10% (ranges vary between sources)
- Migrate to CT
 - Differentiate into macrophages

Task

Virtual Differential white Cell
Count

Differential white cell Count

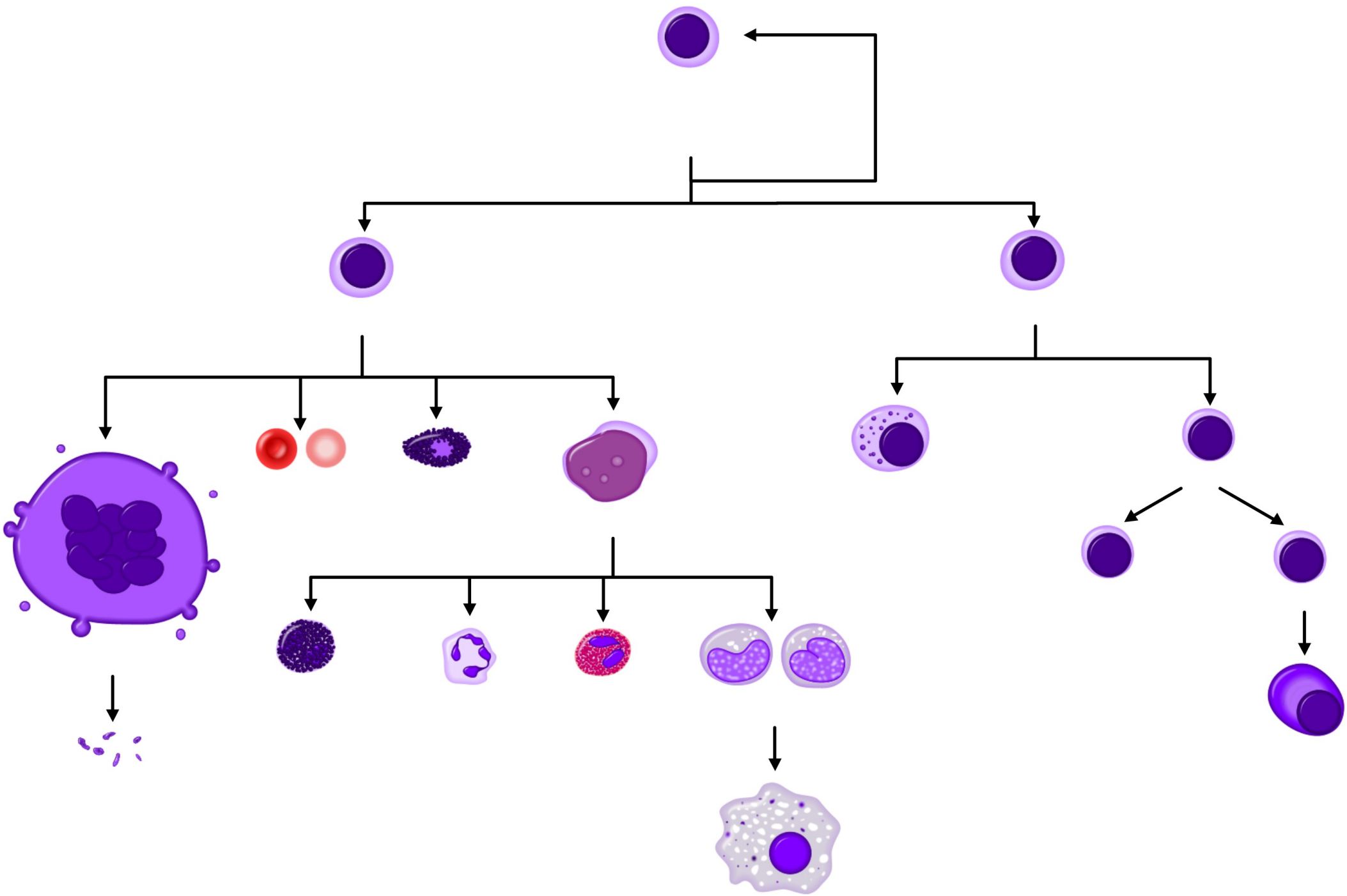
Task 1 – complete table

	Shape of nucleus	Relative amount of cytoplasm	Presence of visible granules	Size of cell
Neutrophils				
Eosinophils				
Basophils				
Lymphocytes				
Monocytes				

Task 1 – complete table

	Shape of nucleus	Relative amount of cytoplasm	Presence of visible granules	Size of cell
Neutrophils	Multi-lobed	Lots	No	3-4x RBC
Eosinophils	Bi-lobed	Lots	Yes	3-4x RBC
Basophils	Kidney shaped	Little	Yes	3-4x RBC
Lymphocytes	Round	Little	No	1x RBC Large L Cytes
Monocytes	Indented	Medium	No	4x RBC

Task 2 - Annotate



Task 3

Differential white
cell count

Differential

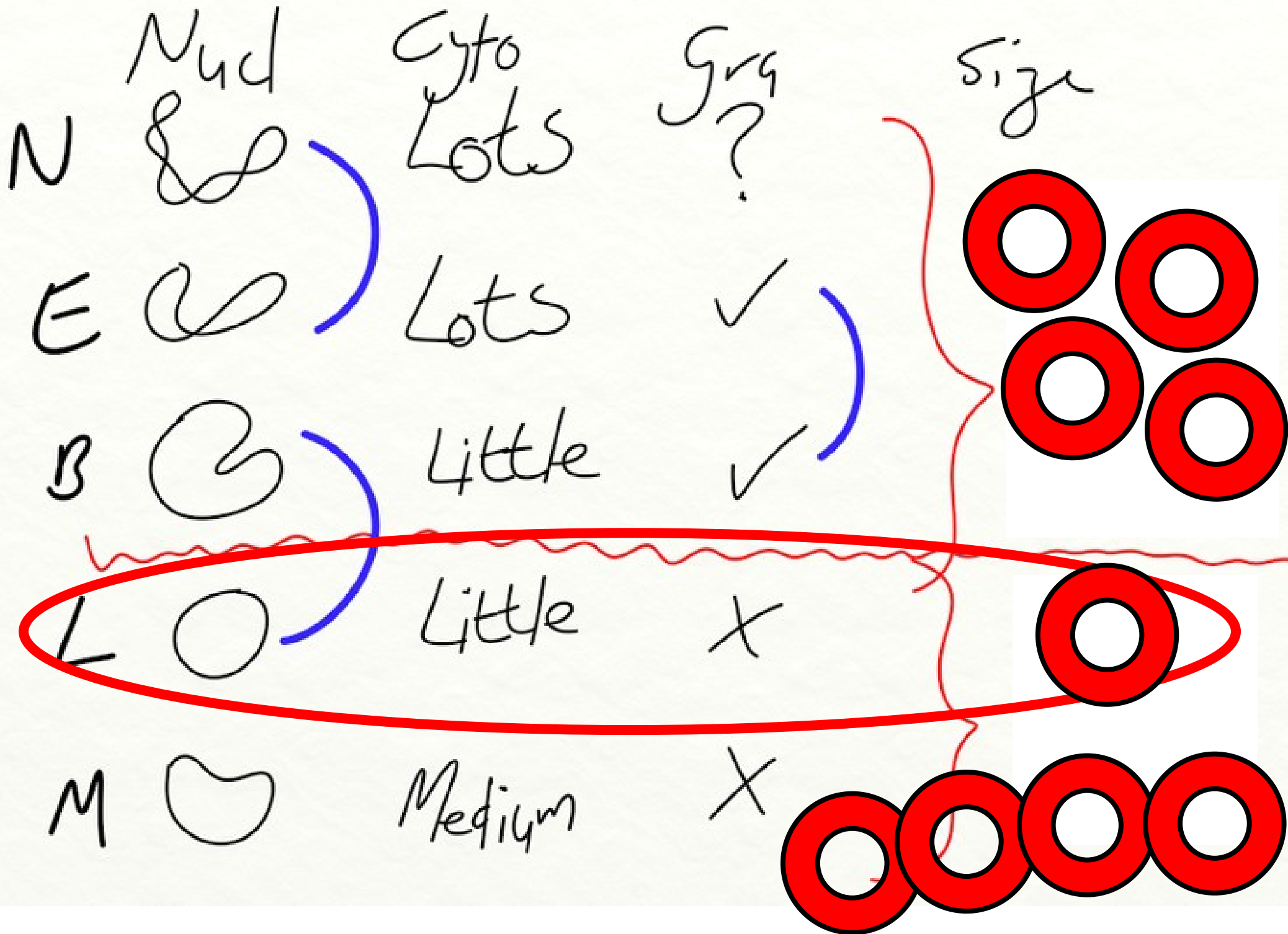
Identify
and
Differentiate

5 types of white blood cells

White Blood Cells

Neutrophils
Eosinophils
Basophils
Lymphocytes
Monocytes

Slide!



Is there a nucleus present?

∨

What is the shape of the nucleus?
(Are you sure it is a nucleus?)

∨

How much cytoplasm is there?
(Relative to nucleus?)

∨

Is the cytoplasm stained?
Are granules present?
(granules colour = nucleus or RBC)

∨

What is the size of the WBC?
(relative to RBC)

cells

Nucleus?

Red Blood Cells
Platelets
Artifacts

Count

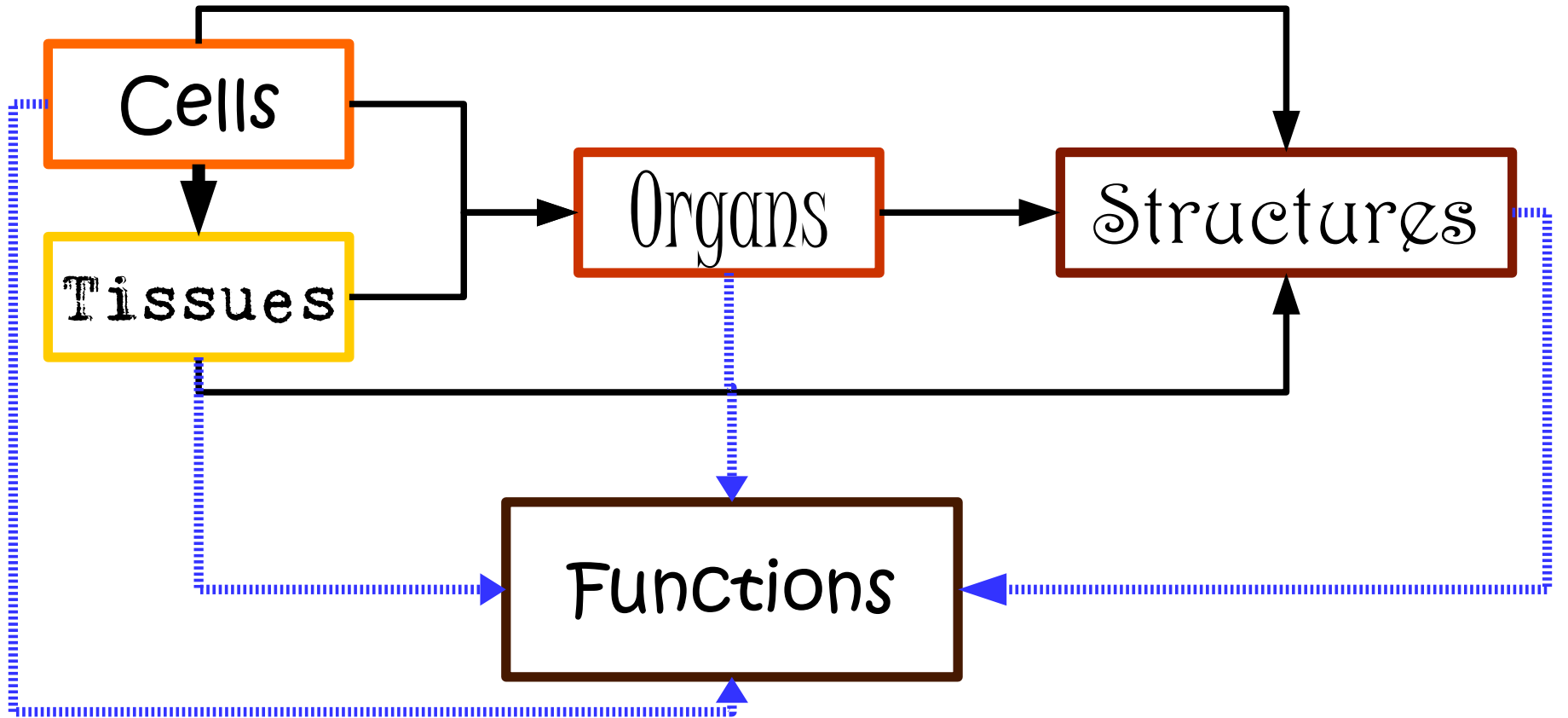
All WBC

Get total

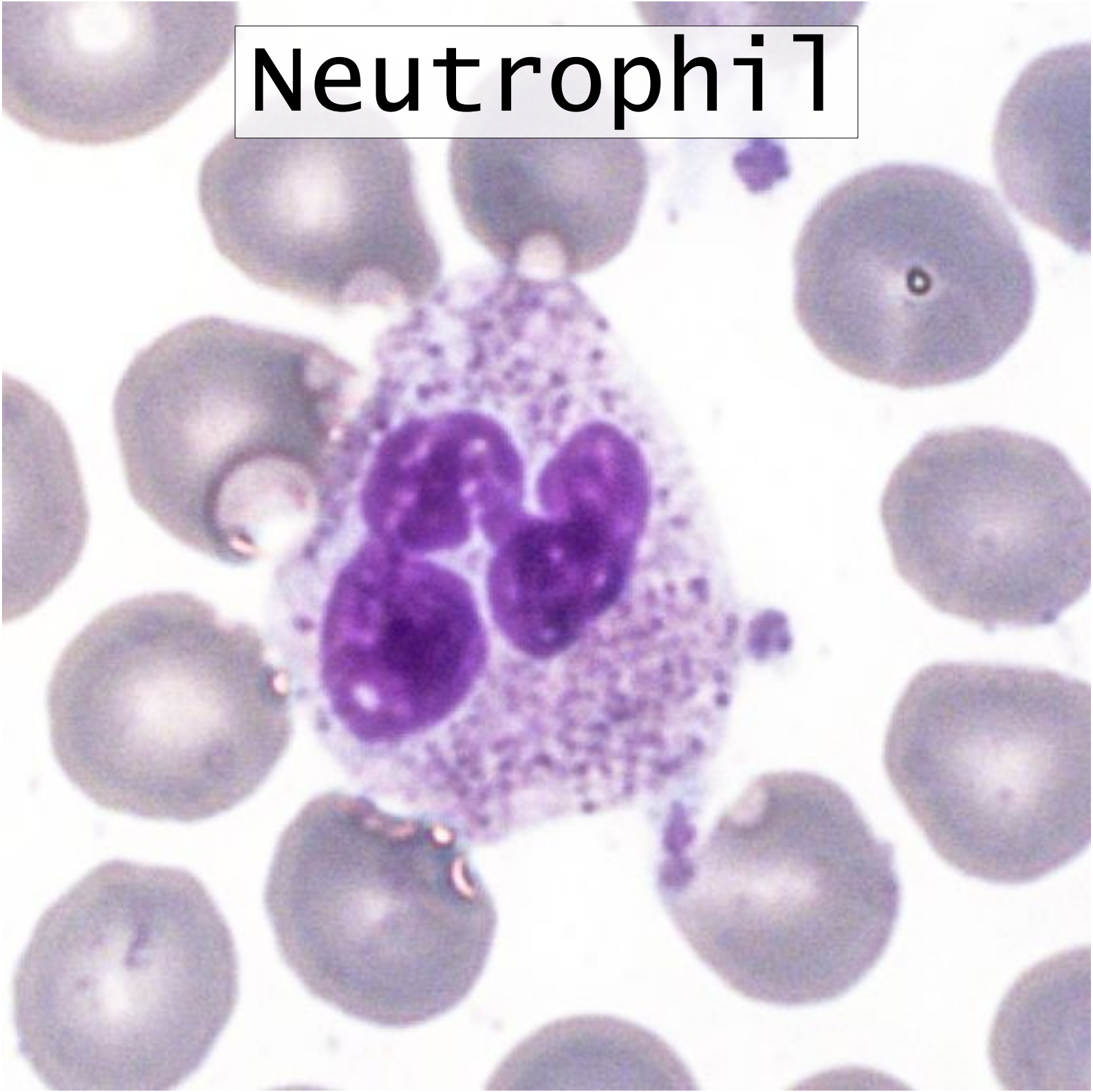
Calculate percentage

White Blood Cell

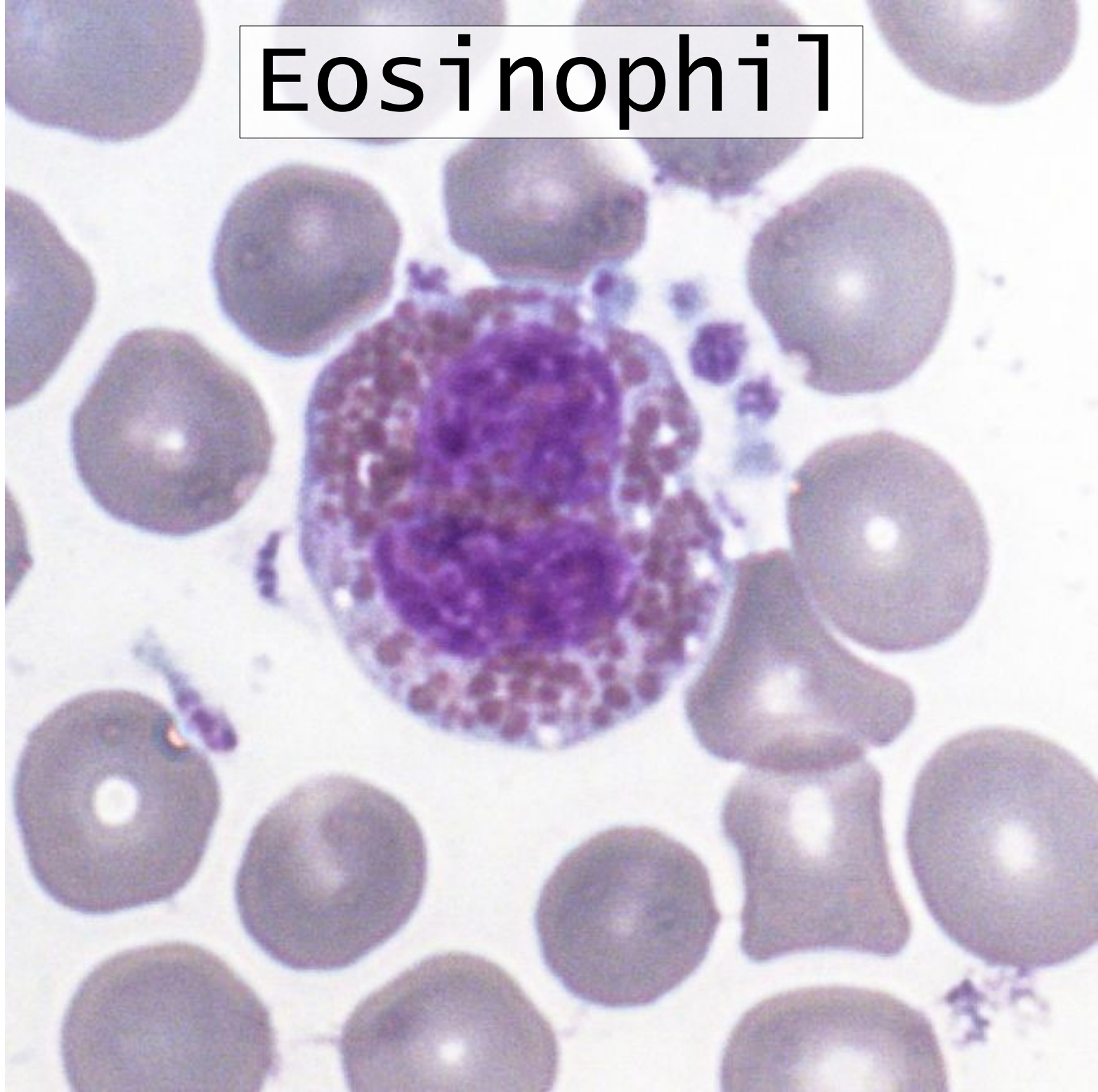
- Nucleus
- Cytoplasm
- Granules
- Size
- RBC – don't beat it
- Don't double count
- Don't sub-contract
- Artifacts



Neutrophil



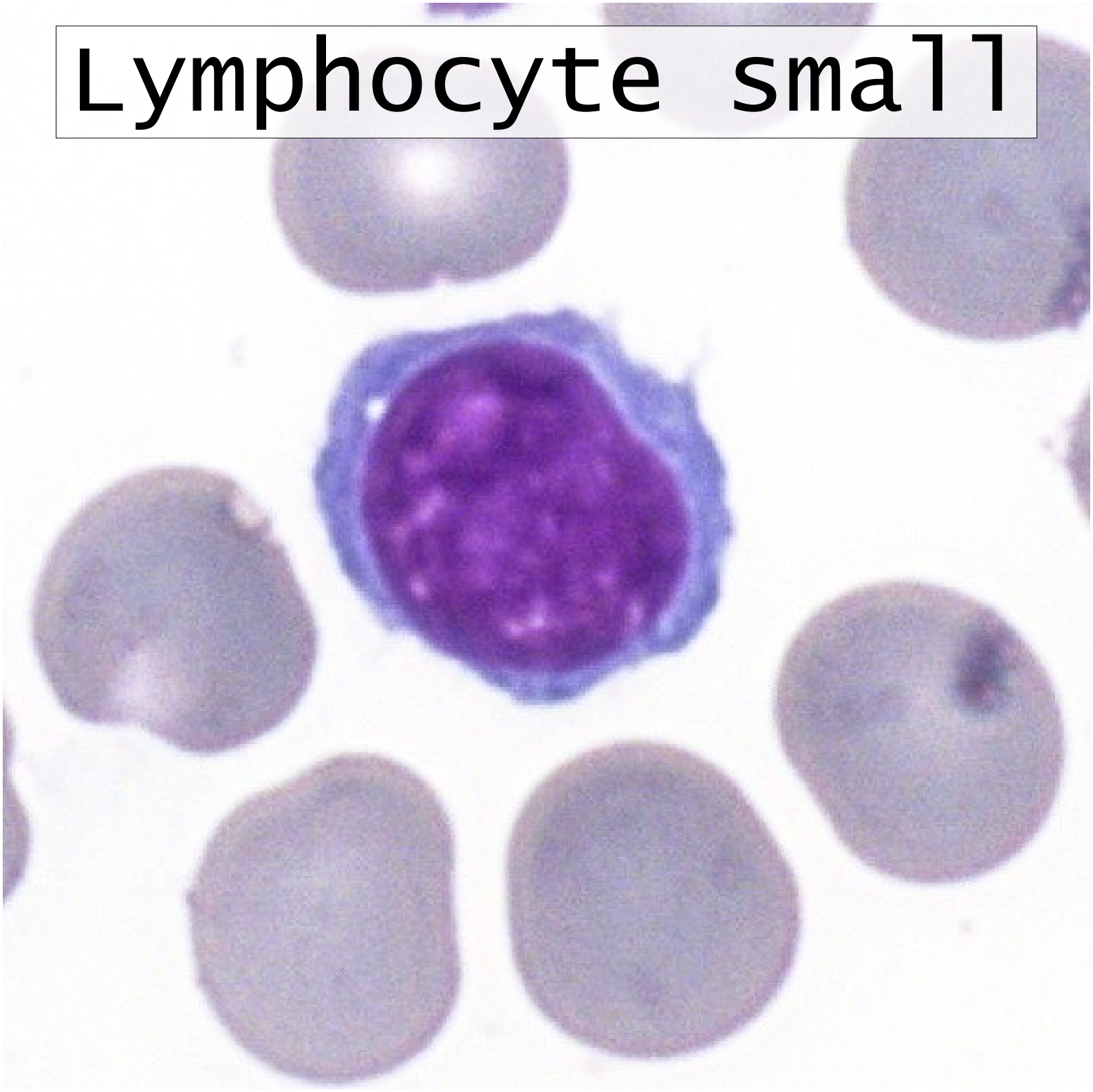
Eosinophil



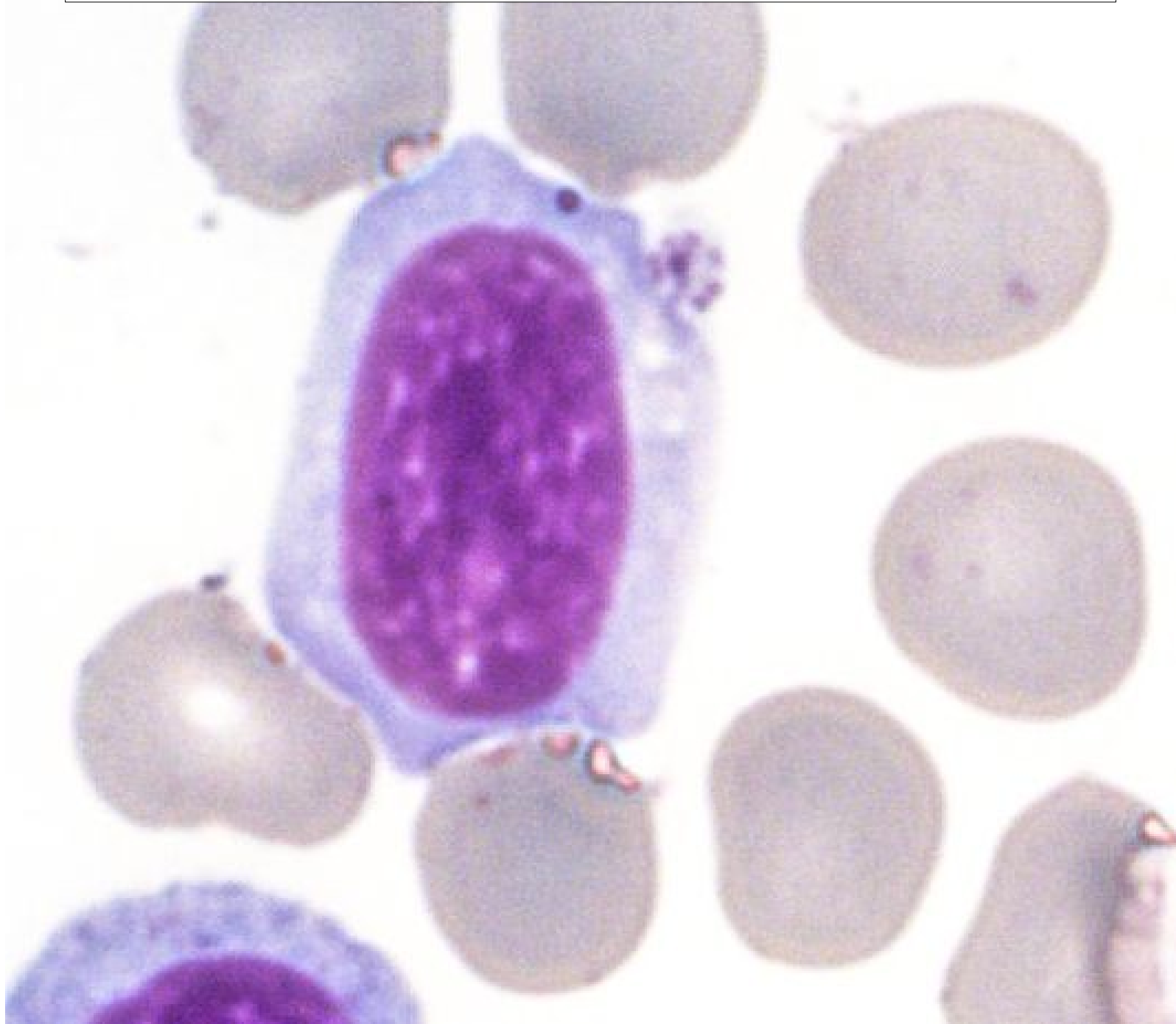
Basophil



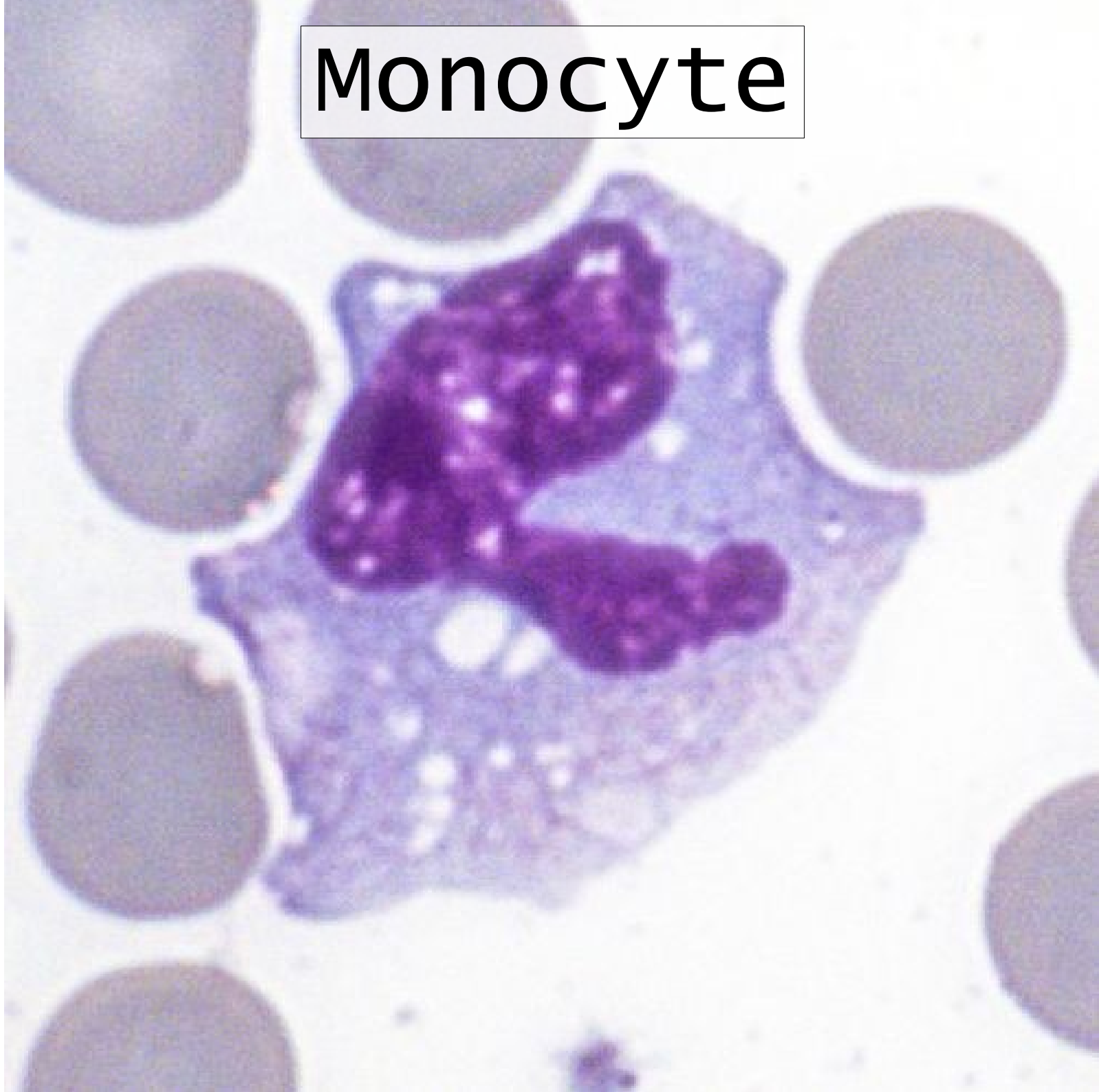
Lymphocyte small



Lymphocyte Large



Monocyte



Differential white Cell Count

what to do.

A step by step description.

Preparation: Theory

- List the cellular components of blood.
- Describe the cellular components of blood.
- Review the characteristics of each of the WBC.
- Look up the normal range for each of the WBC.
- Review the document – **How to look at WS**
- Use Image Search and find examples of the WBC.

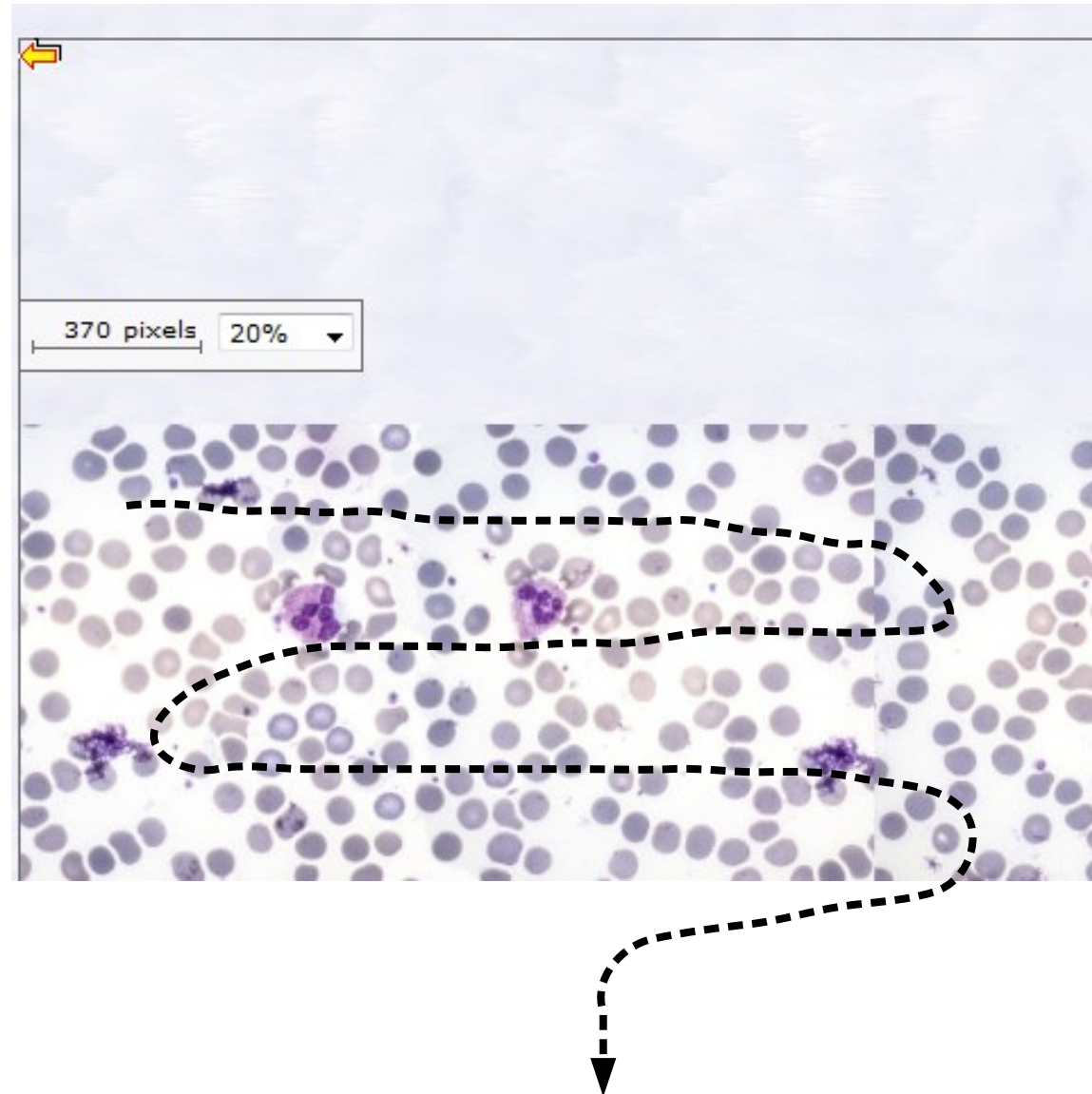
Preparation: Recording results

- Prepare an A4 table to record your results.

	Normal range =	Image	Drawing	Description	Seen	Total	%	< = > Normal
Neutrophils								
Eosinophils								
Basophils								
Lymphocytes								
Monocytes								
					Total =	Total =	100 %	

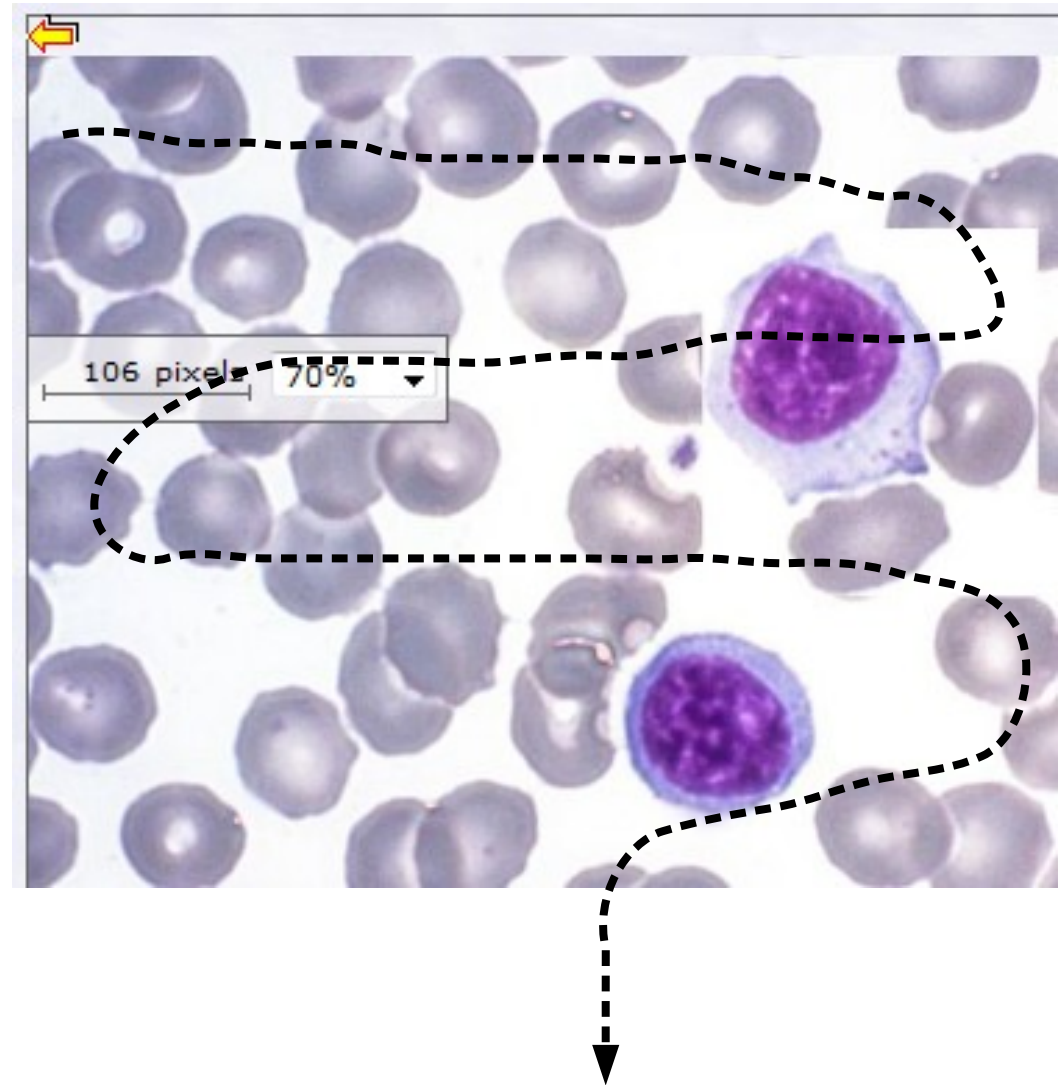
Prepare to count

- Open the blood smear (slide 114).
- Get a feel.
 - Start at the top left.
 - Zoom to about 20% magnification.
 - Scroll from left to right then right to left until you reach the end of the slide.
- Get a feel for the distribution of the WBC on the slide.



Count

- Open the blood smear (slide 114).
- Do the count.
 - Start at the top left.
 - Zoom to about 60% magnification. Zoom higher when needed.
 - Scroll from left to right then right to left until you reach the end of the slide.
- At each object on the slide, decide: artifact, platelets or WBC.
- Identify the specific type of WBC and add to your running count in the table.



Calculate

- For each of the WBC, calculate the % of total.
- $\text{No of WBC} \div \text{Total WBC} \times 100 = \%$
- Compare your values to the normal values.
- All values should be within normal ranges.

If your values are not within the normal ranges,
you have misdiagnosed your patient.

Important notes

- All WBC.
- Beware overlap.
- View the whole slide!
- Do not subdivide the work.
- Work together in identification.
- Show your work when done.

Normal values

- Neutrophils = 40 - 75%
- Eosinophils = 1 - 6%
- Basophils = 0 - 1%
- Lymphocytes = 20 - 45%
- Monocytes = 2 - 10%

Varies between sources!

Your count should fit the above.
If your count does not fit the above:
You have misdiagnosed.

when can we

