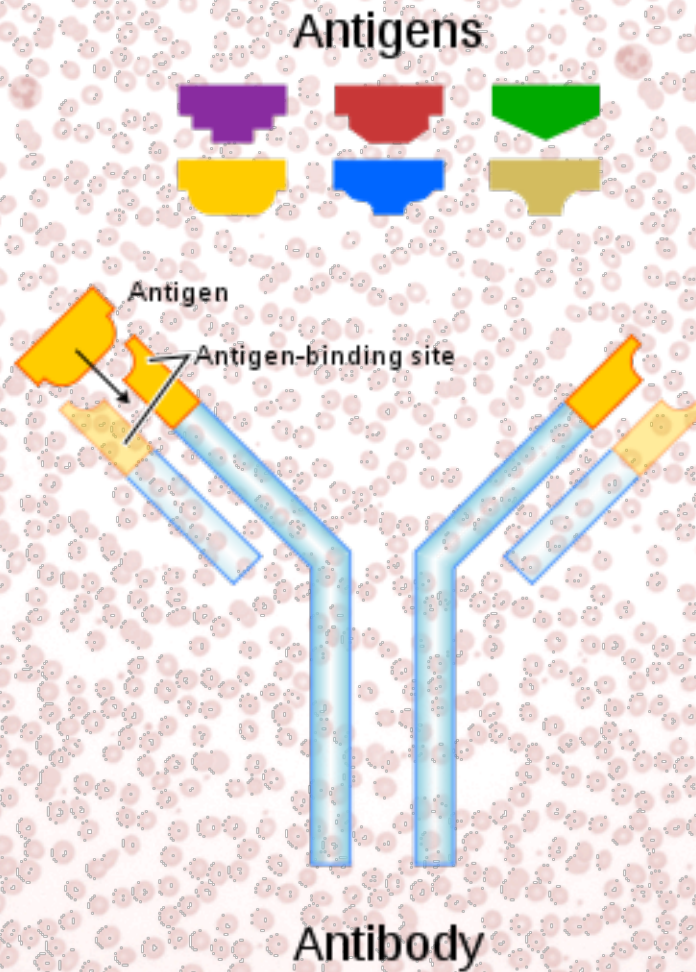


A microscopic view of a blood smear showing numerous red blood cells (erythrocytes) and a few white blood cells (leukocytes). The red blood cells are small, round, and pinkish-red, while the white blood cells are larger and have distinct nuclei. The background is a light pinkish-red color.

Blood: The Stuff of Life

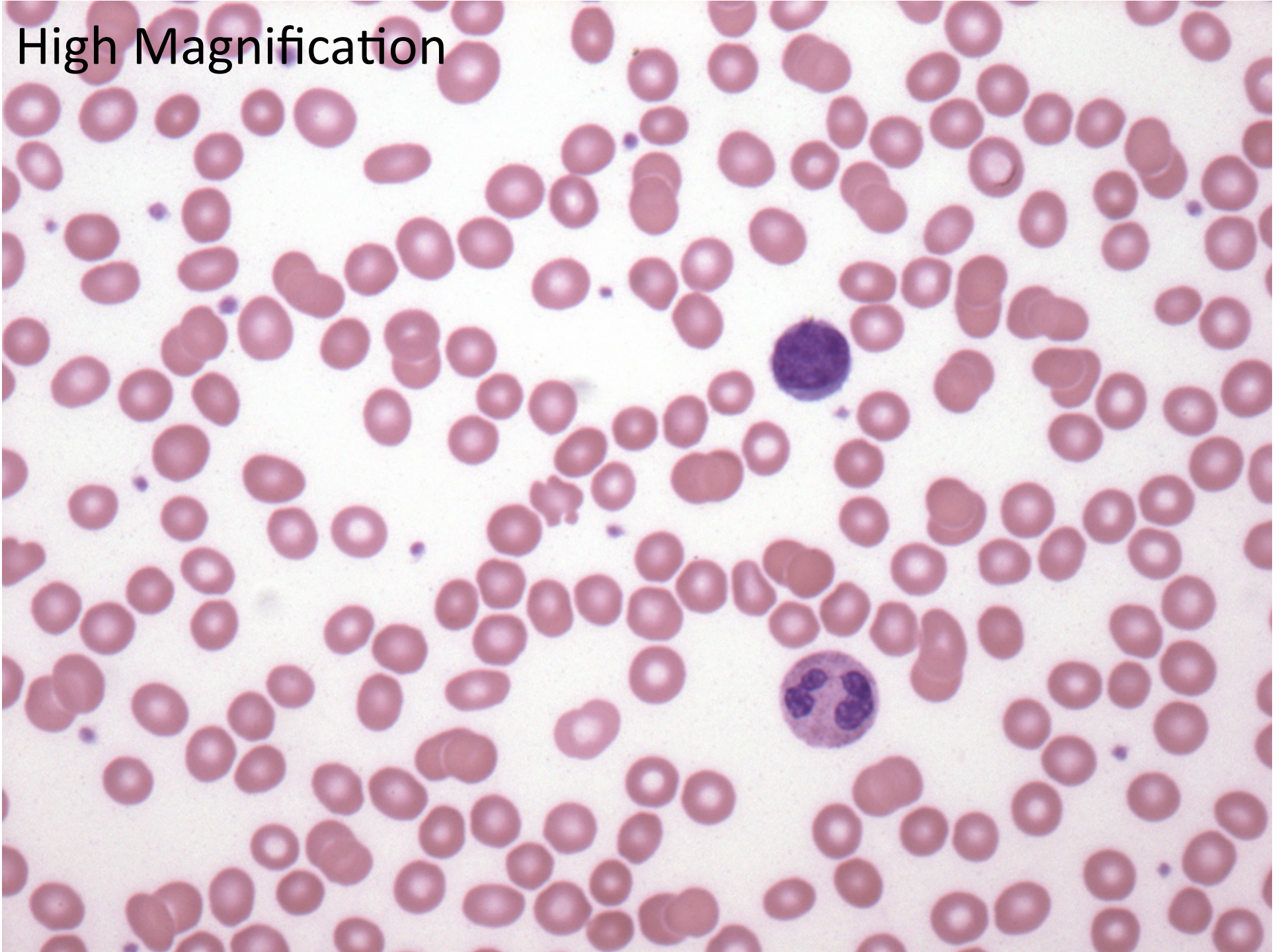
Slides to supplement BLOSSOMS lesson

Antibodies



[http://
en.wikipedia.org/wiki/
File:Antibody.svg](http://en.wikipedia.org/wiki/File:Antibody.svg)

High Magnification

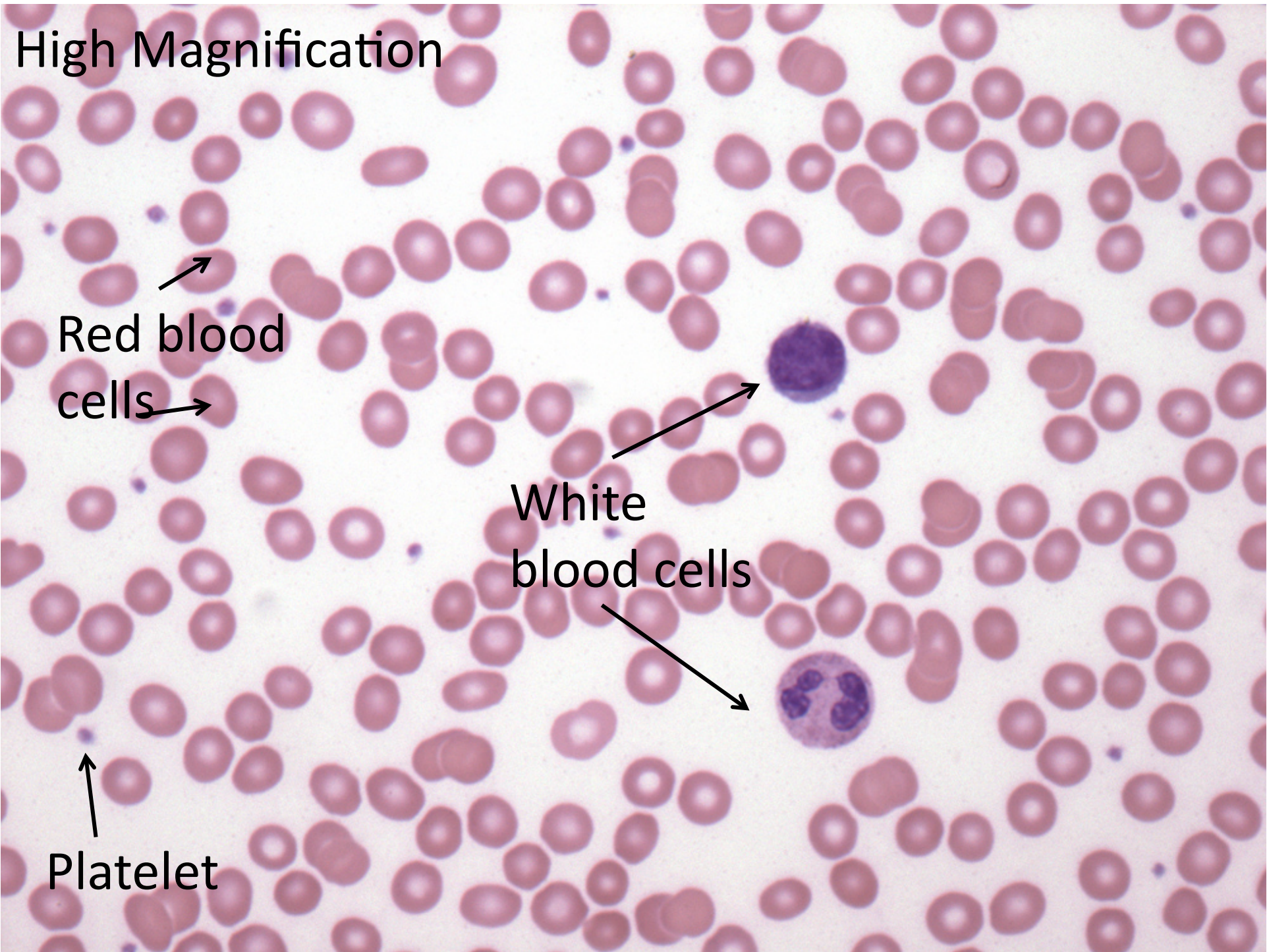


High Magnification

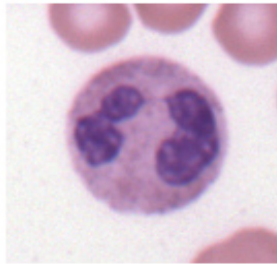
Red blood cells

White blood cells

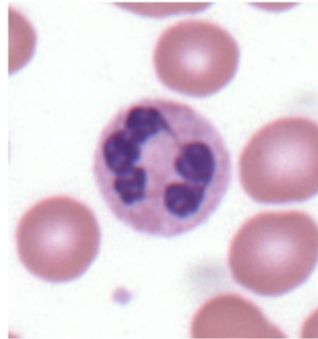
Platelet



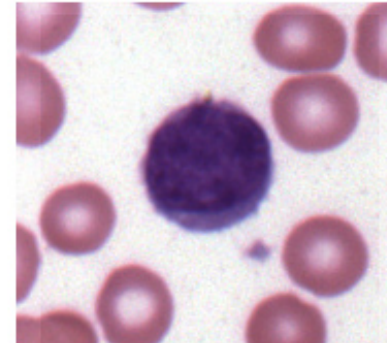
Immune cells found in blood



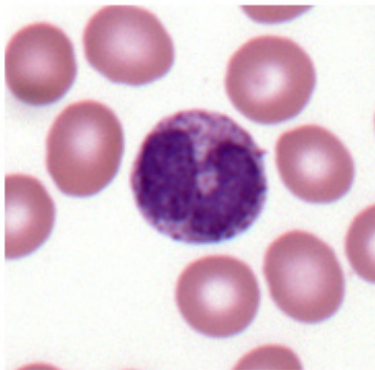
Neutrophil



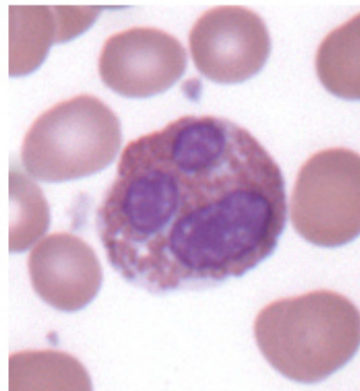
Neutrophil



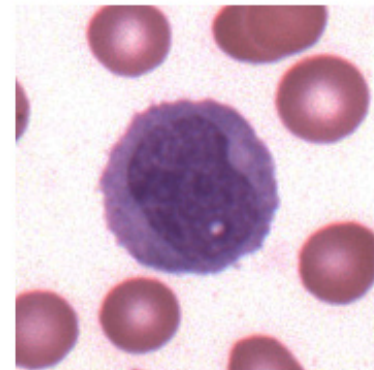
Lymphocyte



Basophil

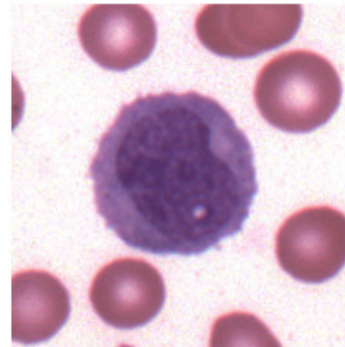
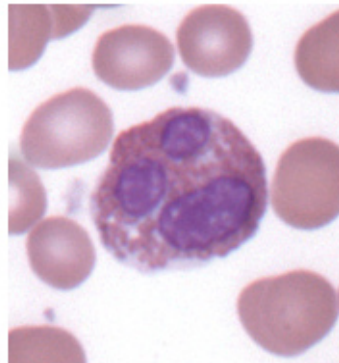
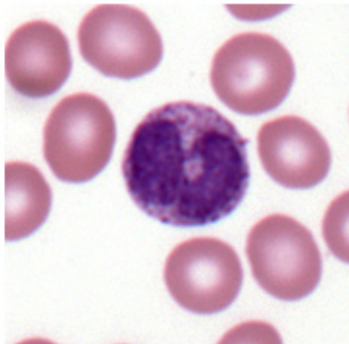
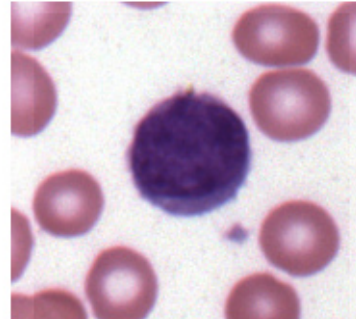
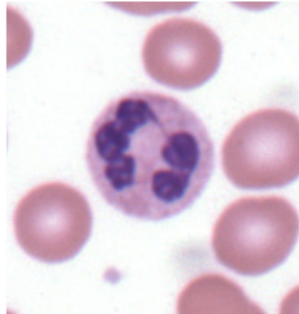
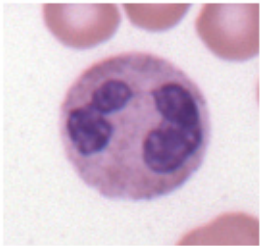


Eosinophil



Monocyte

Immune cells found in blood



Identify:

Neutrophil

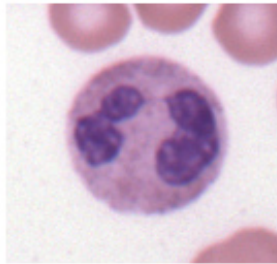
Lymphocyte

Basophil

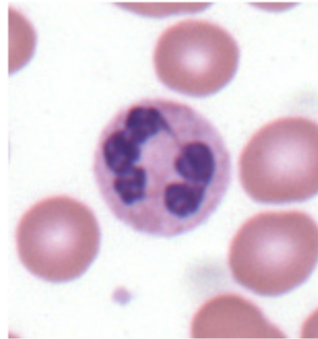
Eosinophil

Monocyte

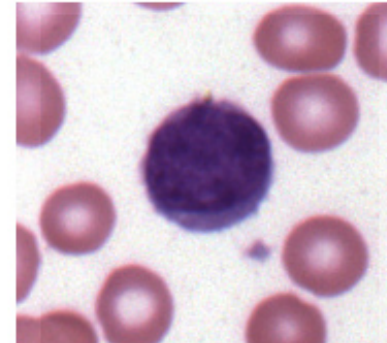
Immune cells found in blood



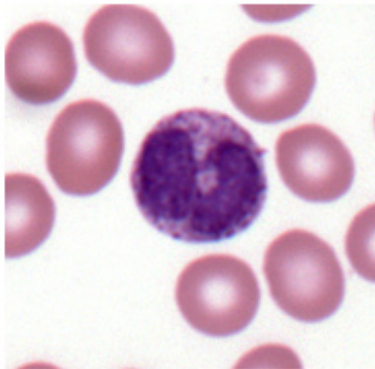
Neutrophil



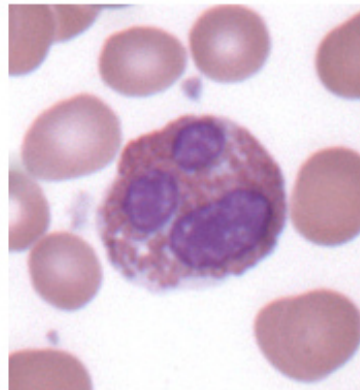
Neutrophil



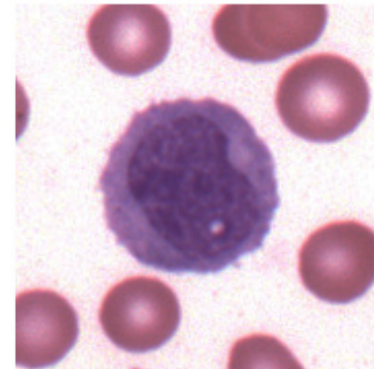
Lymphocyte



Basophil

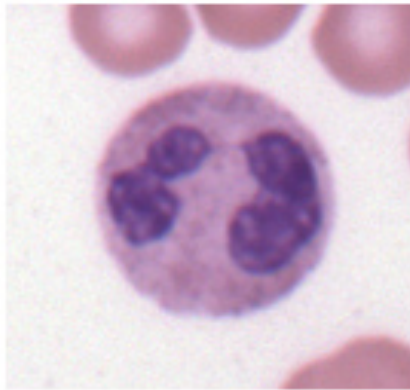


Eosinophil

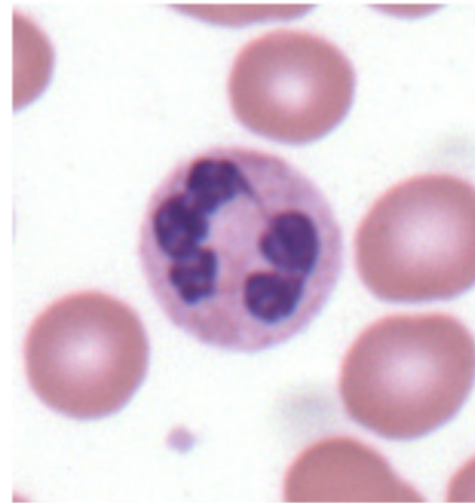


Monocyte

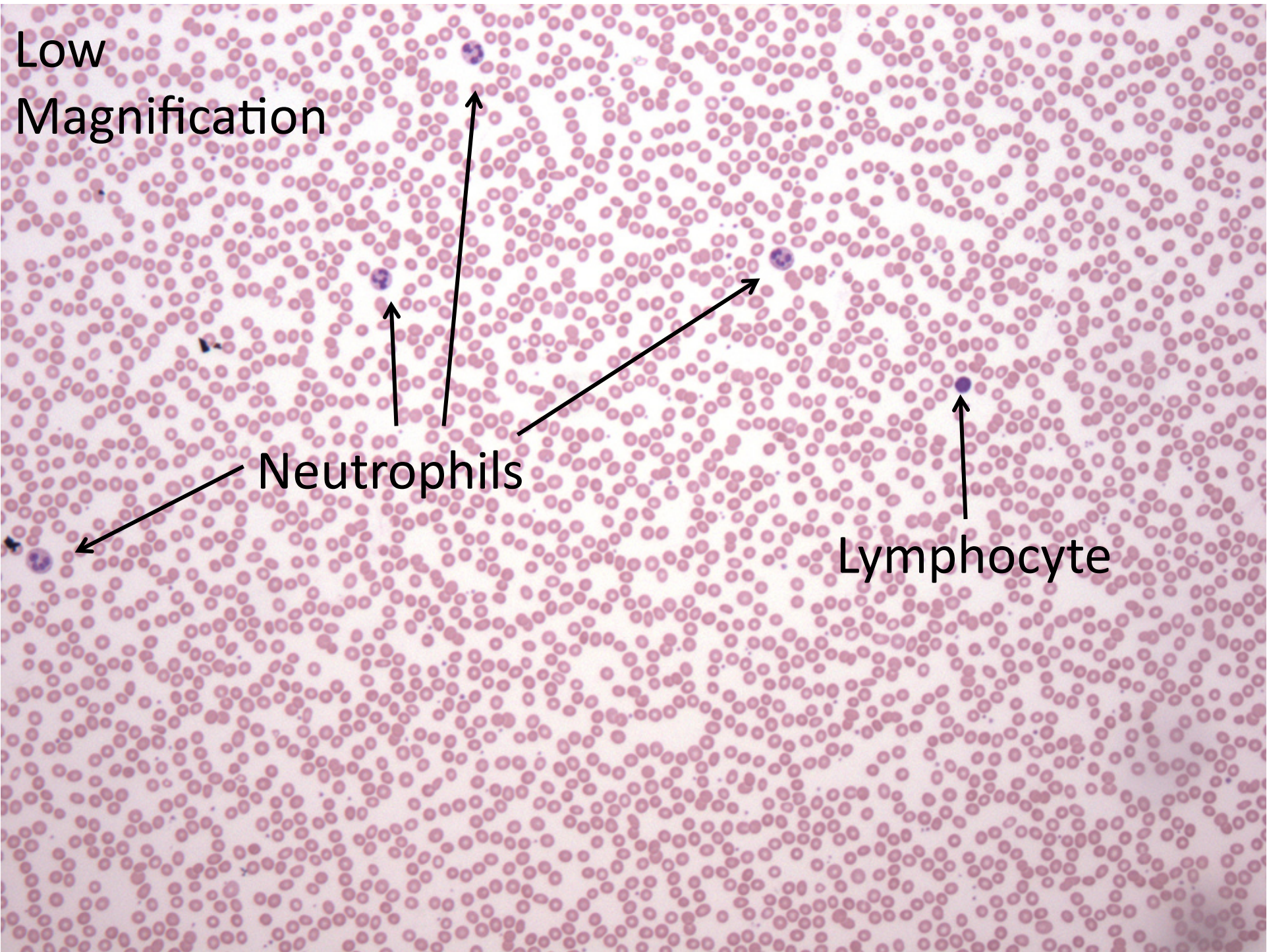
Neutrophils



Neutrophil



Neutrophil

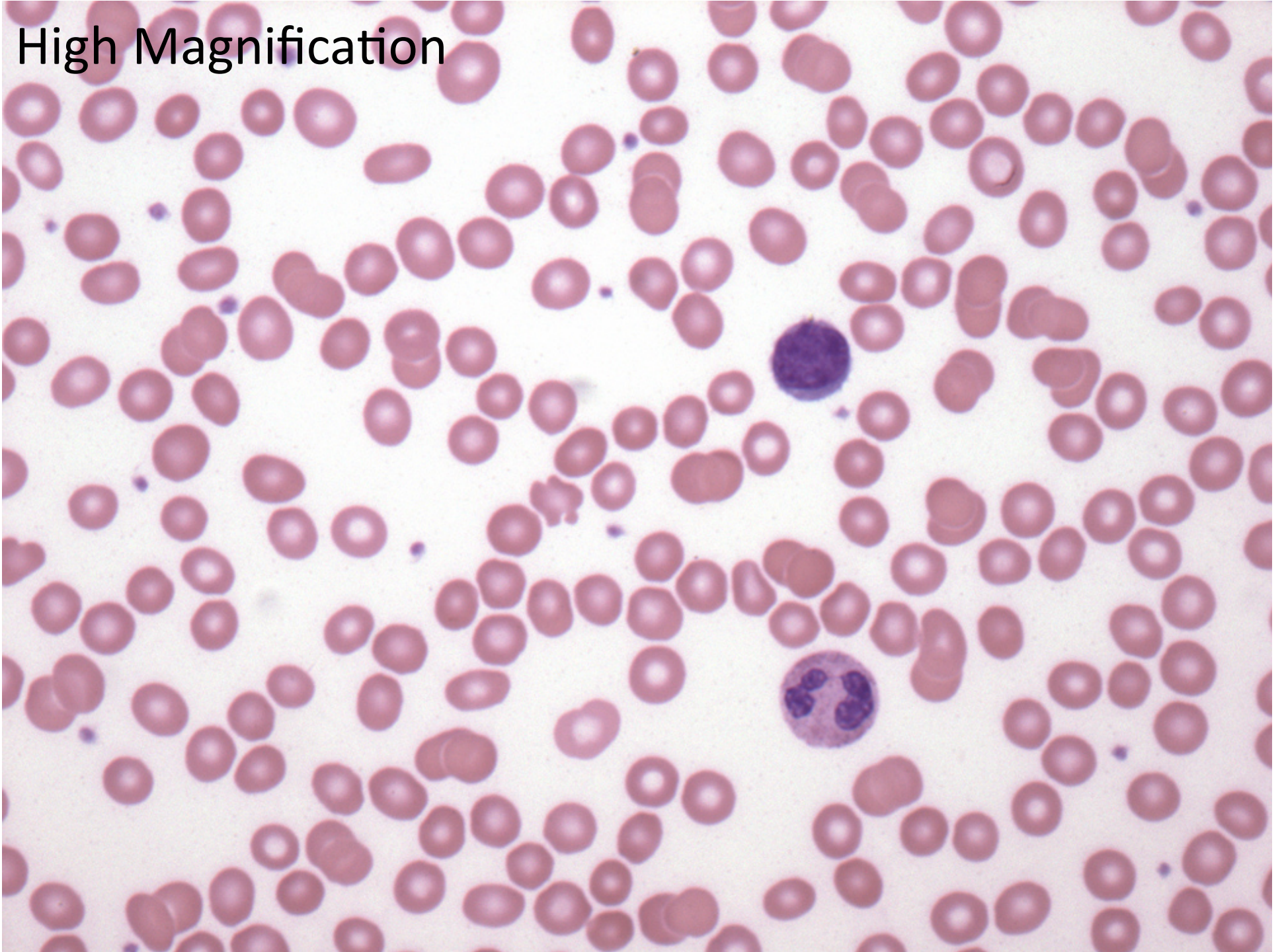


Low
Magnification

Neutrophils

Lymphocyte

High Magnification

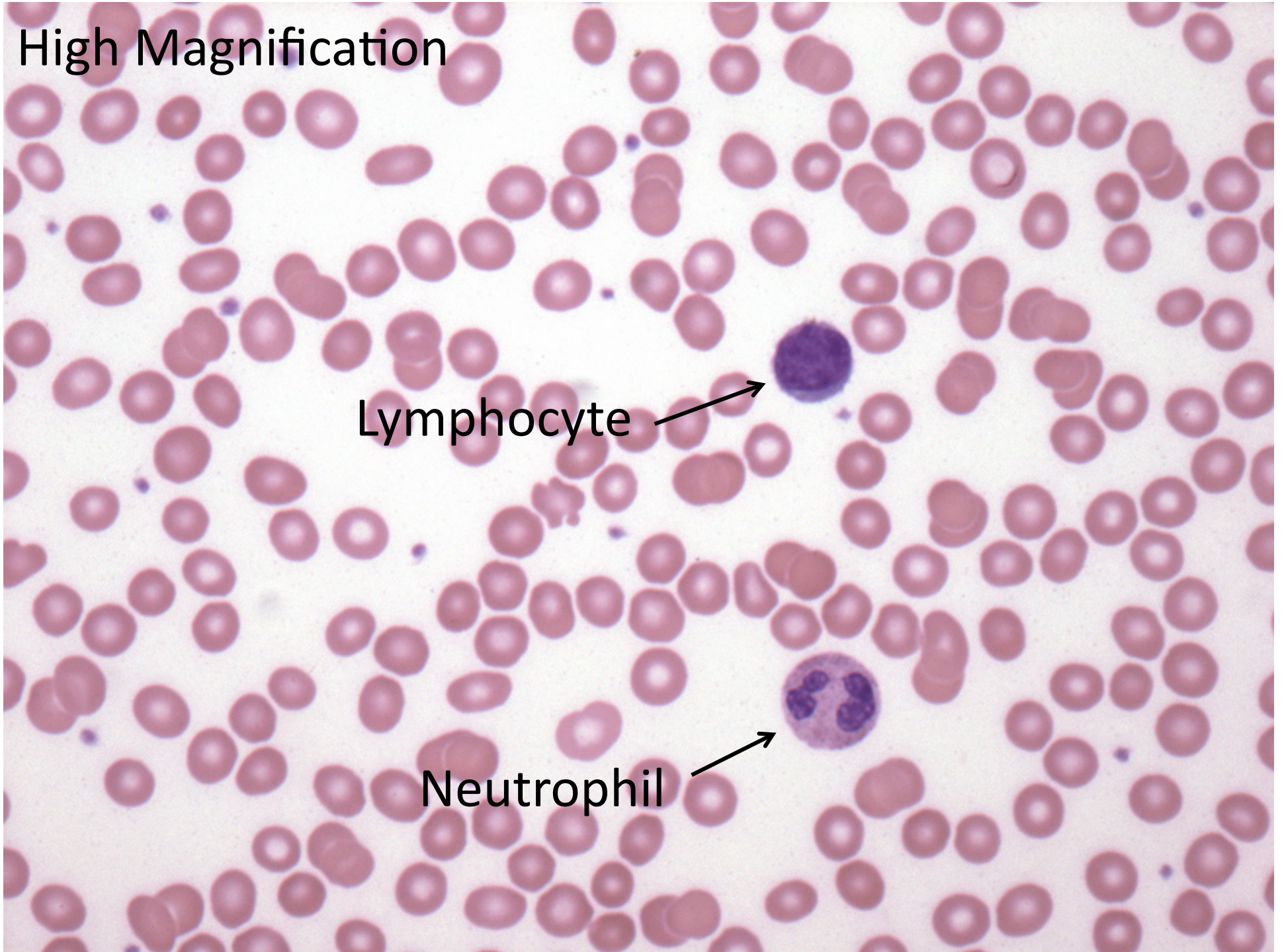
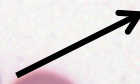


High Magnification

Lymphocyte

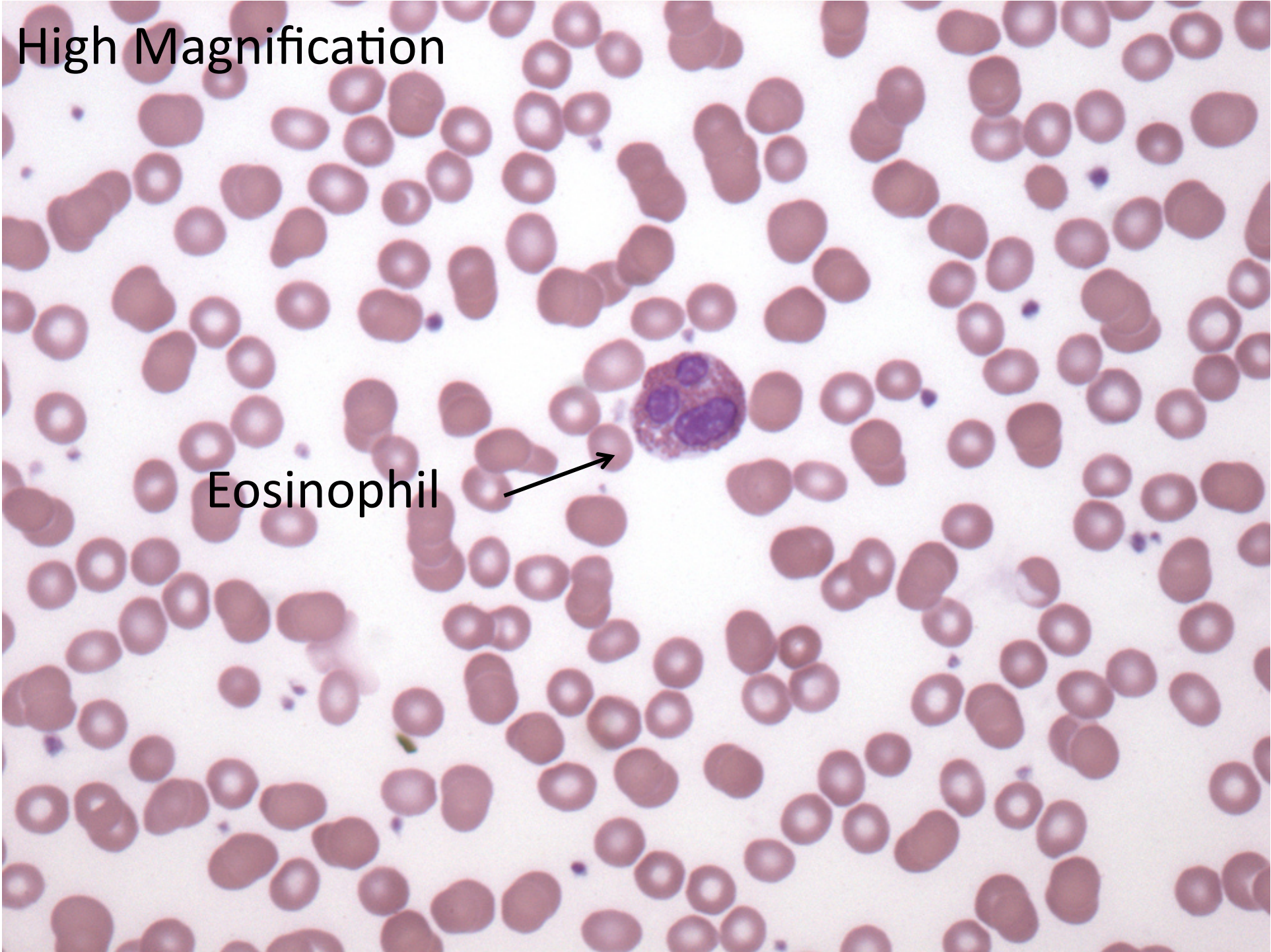


Neutrophil



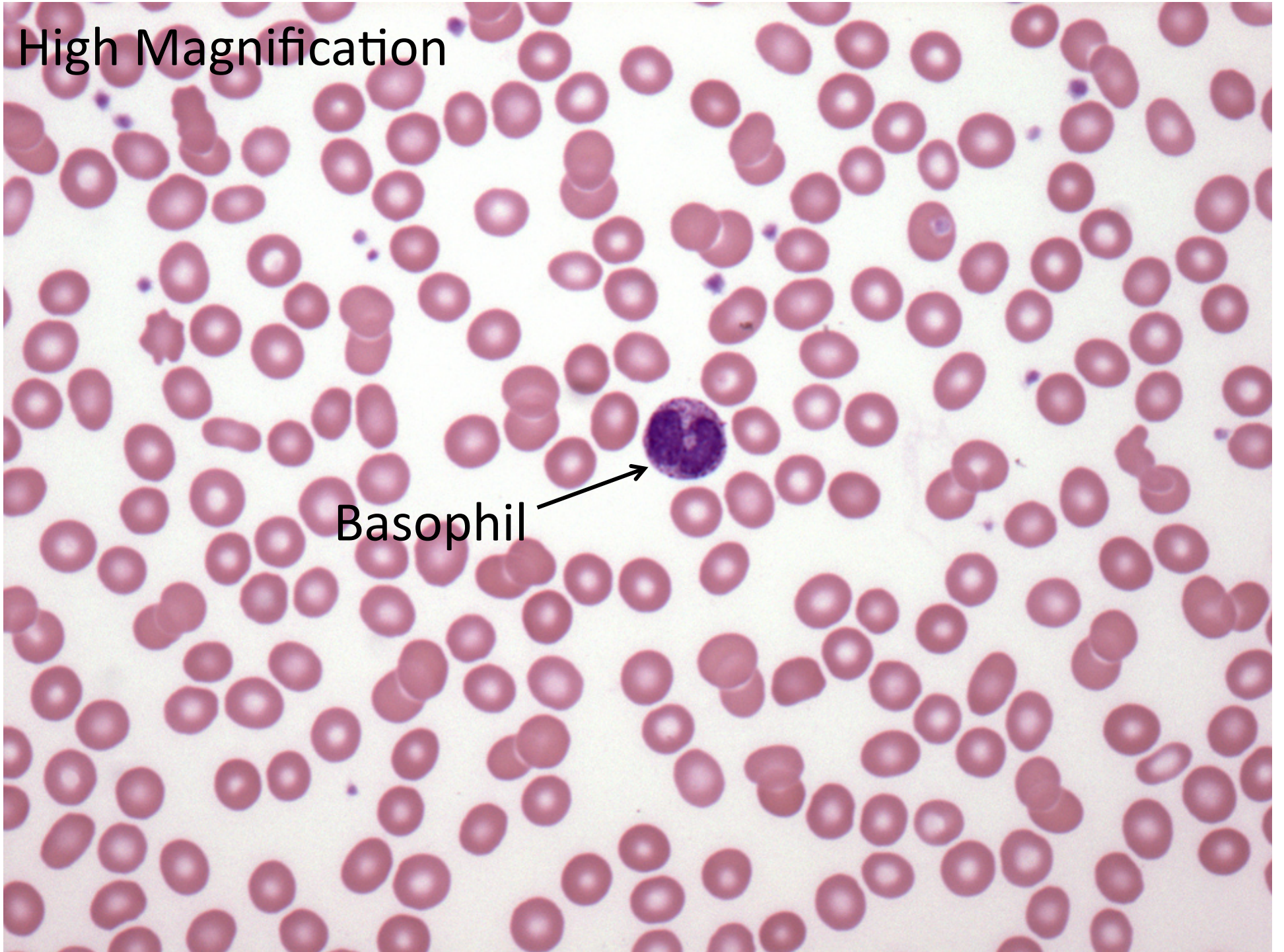
High Magnification

Eosinophil



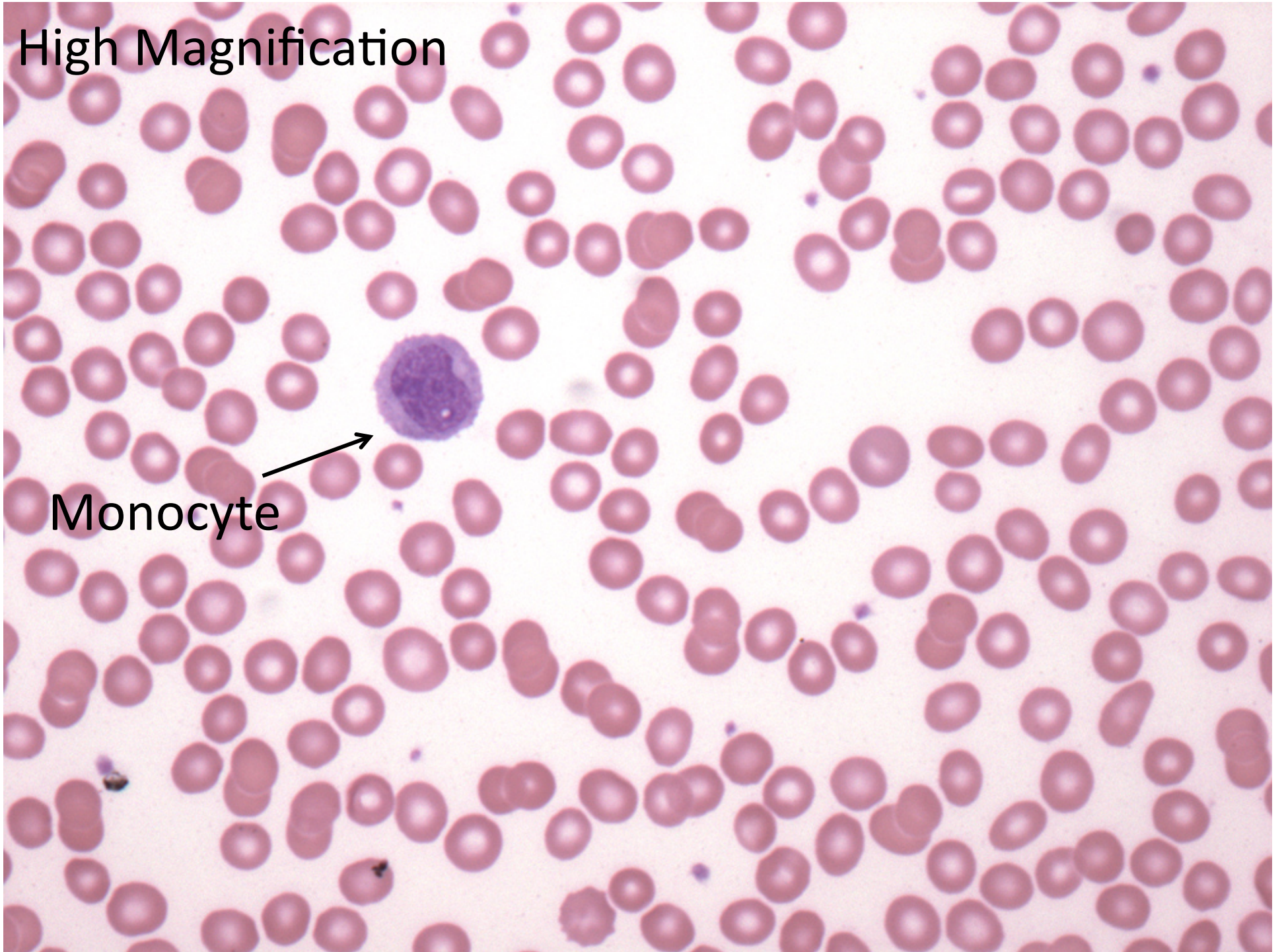
High Magnification

Basophil

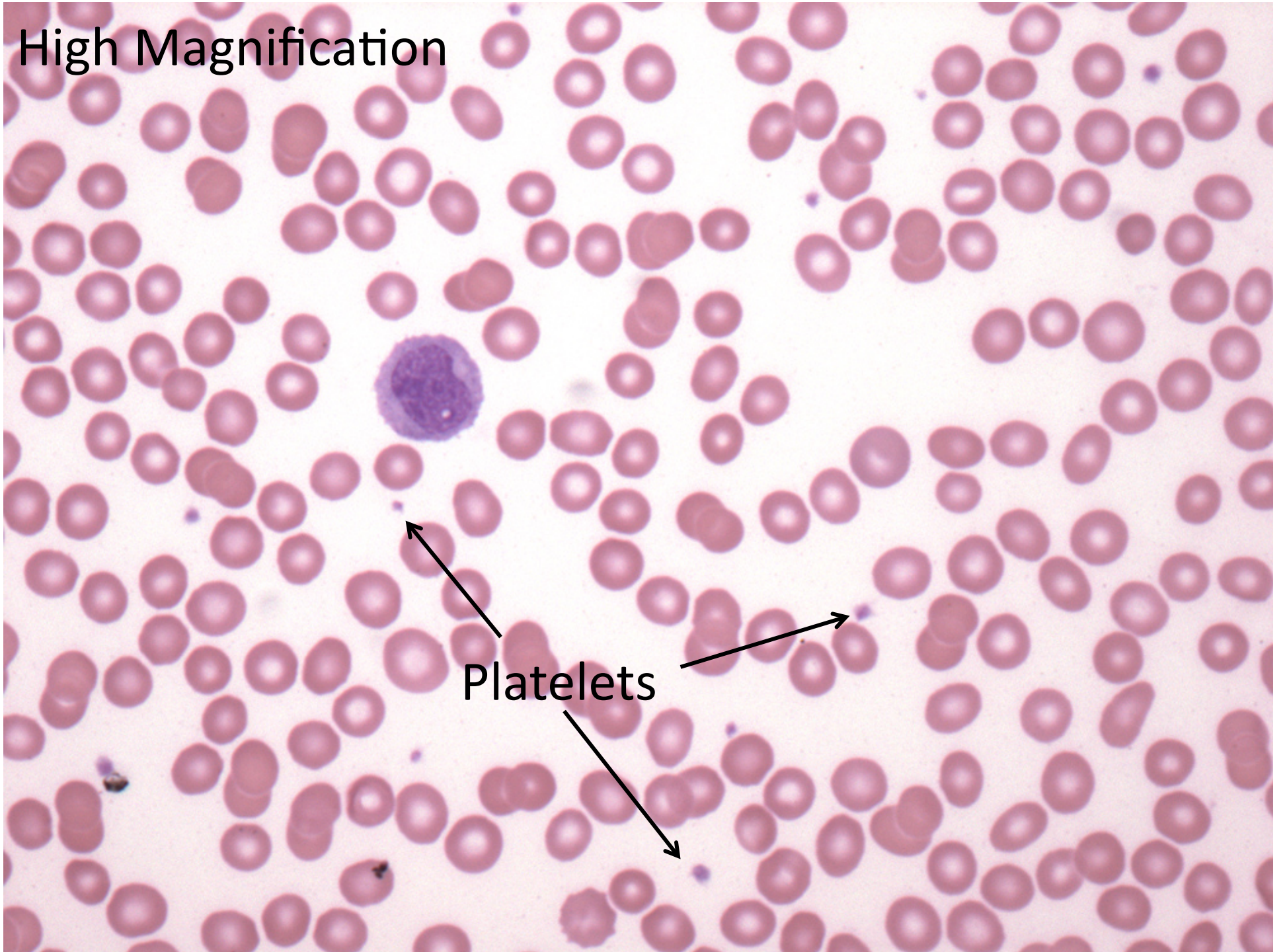


High Magnification

Monocyte



High Magnification



Platelets

Recipe for blood

To prepare 1 liter of blood:

- 550 milliliters of plasma (containing water, albumin, antibodies, electrolytes, etc.)
- 5 trillion red blood cells
- 10 billion white blood cells (lymphocytes)
 - 60% are neutrophils
 - 35% are lymphocytes
 - 4% of monocytes
 - <1% eosinophils and basophils.
- 300 billion platelets

Step 1: Determine your weight in kilograms

- To find your body weight in kilograms:

$$BodyWeight(lb) * 0.45 * \left(\frac{kg}{lb}\right) = BodyWeight(kg)$$

-
- For example, using an example body weight of 130 lbs:

$$130 \text{ pounds} * 0.45 \text{ kilograms/pound} = 58.5 \text{ kilograms}$$

Step 2: Determine the volume of water in your body

- To find your body weight in kilograms:

$$\text{BodyWeight}(kg) * 0.6 = \text{WaterWeight}(kg)$$

- To find the volume of the water in your body

$$\text{WaterWeight}(kg) * \text{DensityOf Water} \left(\frac{1L}{kg} \right) = \text{WaterVolume}(L)$$

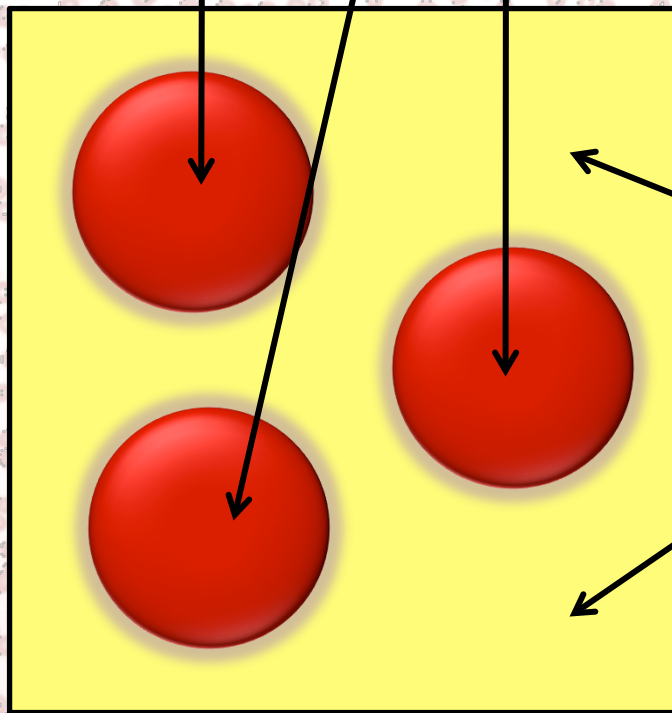
- For example, using an example body weight of 130 lbs:

58.5 kilogram body weight * 0.6 = 35.1 kg of water in the body

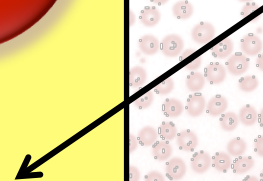
35.1 kg of water * 1 L/kg = 35.1 L of water in the body

Intracellular vs. extracellular fluid

Intracellular fluid (inside cells)



Extracellular fluid (outside cells)



Step 3: Determine your blood volume

- To find your extracellular (outside of cells) fluid volume:

$$TotalWaterVolume(L) * \frac{1}{3} = ExtracellularFluidVolume(L)$$

- To find your blood volume (blood makes up about a third of extracellular fluid):

$$ExtracellularFluidVolume(L) * \frac{1}{3} = BloodVolume(L)$$

-
- For example, using an example body weight of 130 lbs:
35.1 L of water in my body * (1/3) = 11.7 L of extracellular fluid
 - 11.7 L of extracellular fluid * (1/3) = **3.9 L of blood in the body of someone who weighs 130 lbs**