



# Peripheral blood smear

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# ***Blood film examination***

- PBS is a component of CBC
- The process of making thin blood film causes some inevitably artifacts due to mechanical trauma,fixation,exposure to methanol and water,but these can be minimized by good technique
- Blood film should be prepared immediately if possible

# Examination of wet preparations

- It has some advantages to examine fresh blood, such as avoiding artifacts of fixation or staining
- Sealing a small drop of blood diluted with isothonic sodium chloride beneath a coverslip on a glass slide
- Buffered glutaraldehyde will preserve the cells for reexamination at a later time
- Petroleum jelly or xipamide (Aquaphor) may be used to seal the edges of the coverslip to the slide
- Wet smears are useful to detect sickling and spherocytes

# Making and staining blood films

## -Two slide or Wedge method:

- \*place a drop of blood 2 to 3 mm in diameter about 1 cm from the end of a clean,dust-free slide that is on a flat surface
- \*with the thumb and forefinger of the right hand,hold the end of a second(spreader) slide against the surface of the first slideat the angle of 30 to 45 degrees and draw it back to contact the drop of blood
- \*allow the blood to spread and form the angle between the two slides
- \*push the spreader slide at a moderate speed forward until all the blood has been spread
- \*the spreader slide shoul be clean,dry and if possible narrower than the first slide

# Wedge method

- At a given speed,increasing the angle of the spreader slide will increase the thickness of the film
- At a given angle,increasing the speed of the spreader will also increase the thickness of the film
- The film should be rapidly air dried by waving the slides or using an electrical fan(slow drying,for example in humid weather,results in contraction artifacts of the cells),**BUT DO NOT BLOW TO DRY**
- The slide should be labeled with a lead pencil on the frosted end or directly on the thicker end of the blood film

# Wedge method

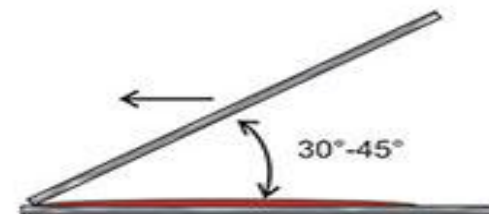
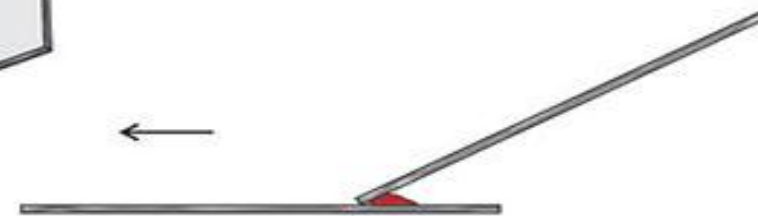
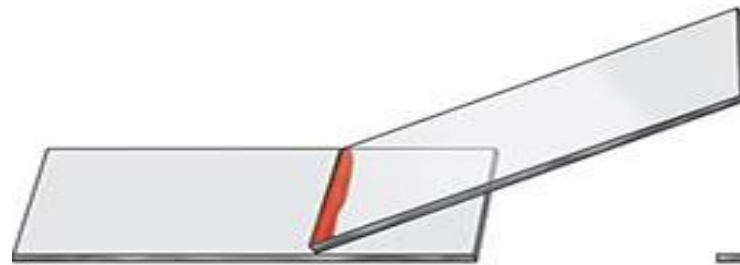
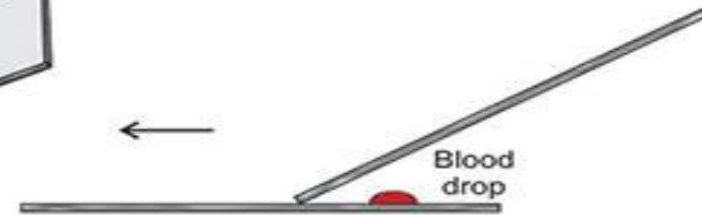
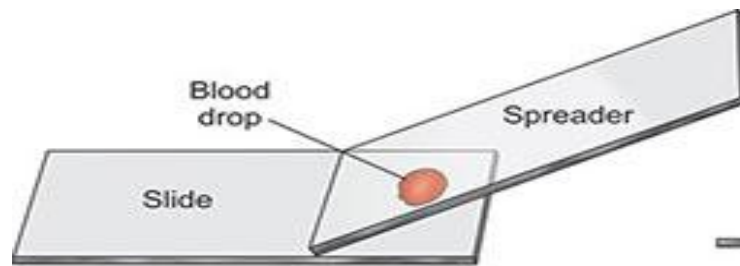
- If the hematocrit is increased,the angle of the spreader slide should be decreased
- If the hematocrit is decreased,the angle of the spreader slide should be increased

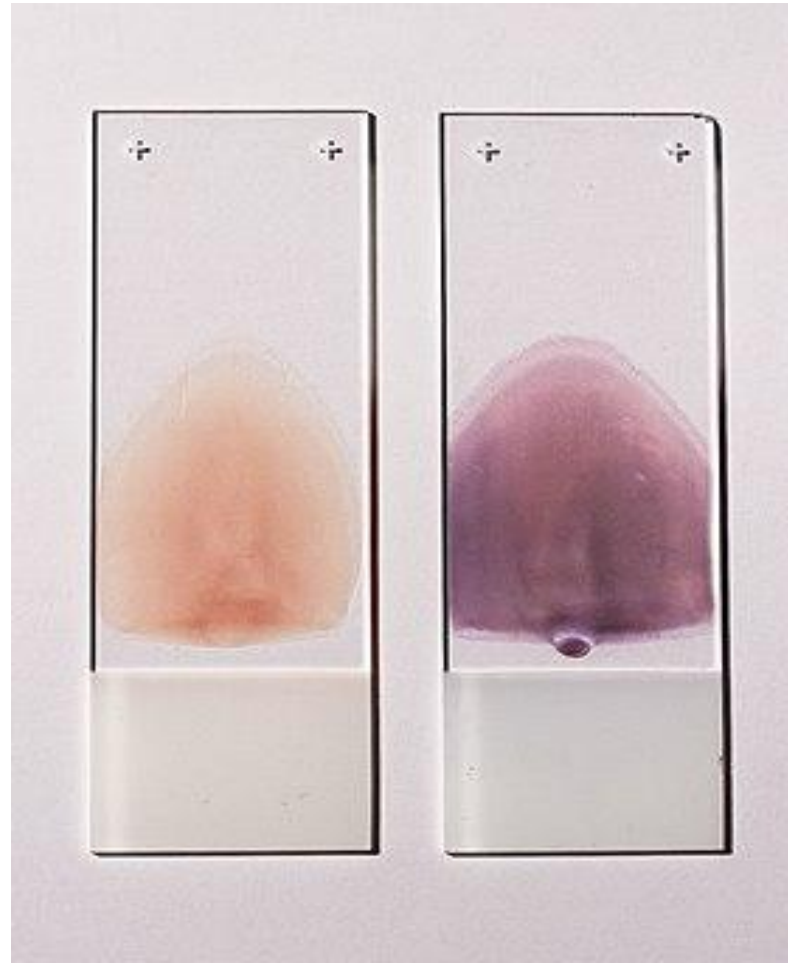
# Wedge method

## Biologic causes of a poor smear

- \*warm the blood at 37°C for 5 minutes and remake the smear
  - Lipemia: holes will appear in the smear
    - \*there is nothing you can do to correct this
  - Rouleaux: RBCs will form into stacks resembling coins
    - \*there is nothing you can do to correct this
  - Cold agglutinin: RBCs clump together







# Cover glass method

- No. 1 or 1.5 cover glasses 22 mm square are recommended
- Touch a cover glass to the top of a small drop of blood without touching the skin, and place it, blood side down, crosswise on another cover glass, so that the corners appear as an eight-point star
- Just as it stops spreading pull the cover glasses quickly but firmly apart on a plane parallel to their surfaces
- The blood usually is much more evenly spread on one of the cover glasses than it is on the other
- Cover glasses should be placed film side up on clean paper and allowed to dry in the air
- Films from venous blood may be prepared similarly

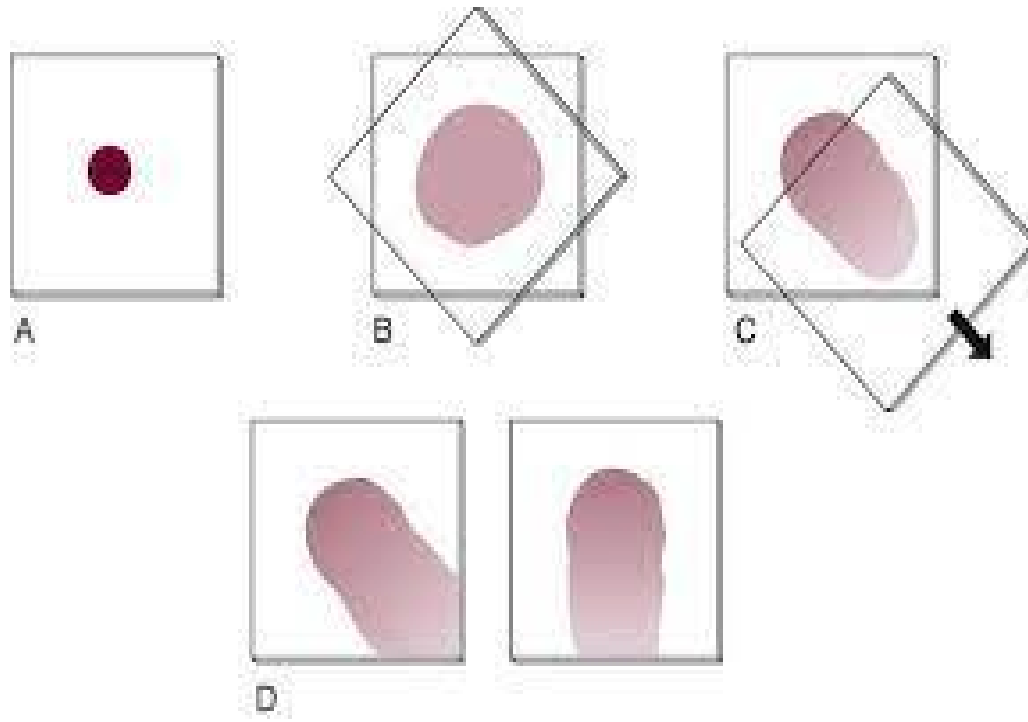
Designated Size	Tolerance (mm)
#00	0.06–0.08
#0	0.08–0.12
#1	0.13–0.16
#1.5	0.16–0.19
#2	0.19–0.23
#3	0.28–0.30
#4	0.38–0.42
#5	0.50–0.60

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Refractive Index at 20°C for Commonly Used Glass

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Desag D-263	(546 nm) = 1.5255
	(588 nm) = 1.5230
Corning 0211	(589 nm) = 1.5230



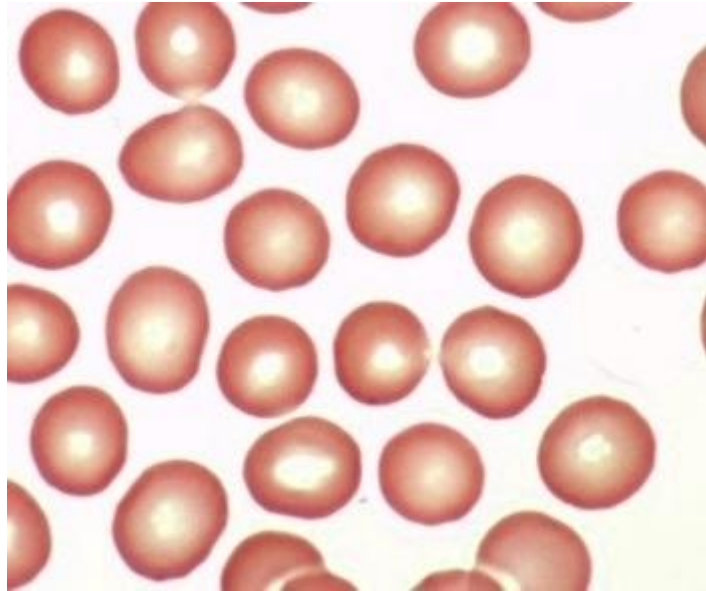
# Spinner method

-Blood films that combine the advantages of easy handling of the wedge slide and uniform distribution of cells of the coverglass preparations may be made with special types of centrifuges known as SPINNERS

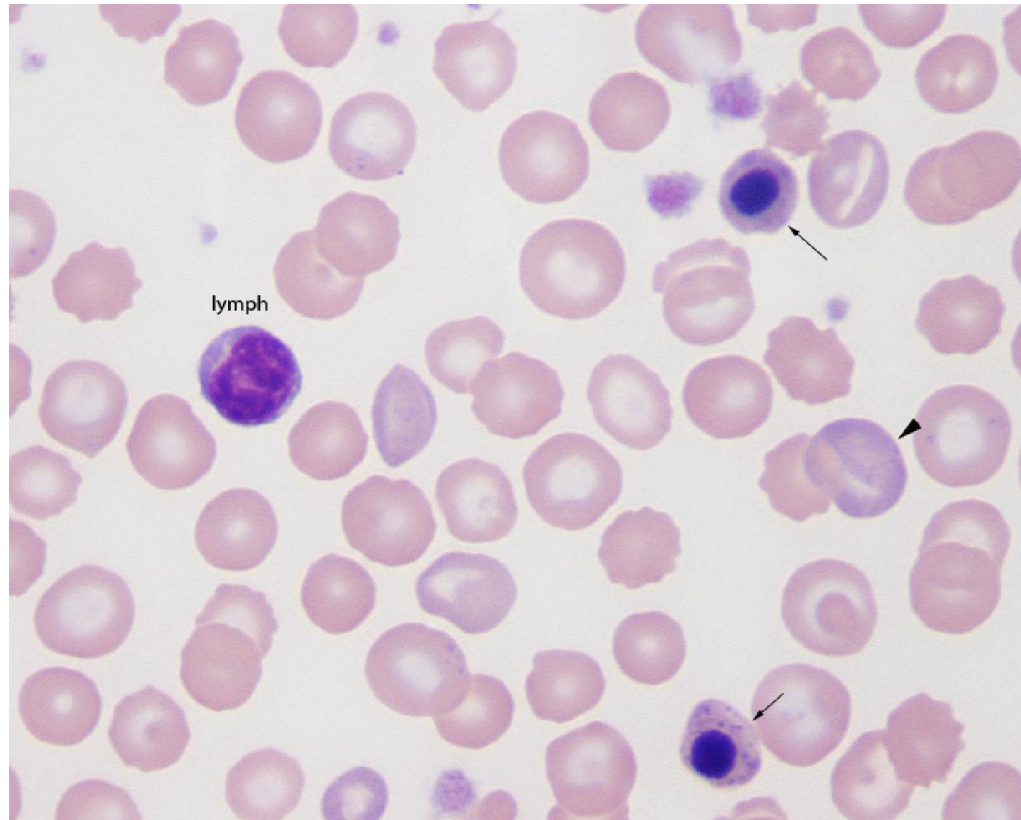
## Two additional types of blood smear

- \*Buffy coat smear for WBCs  $< 1000 / \text{mm}^3$

- \*Thick blood smear for blood parasites







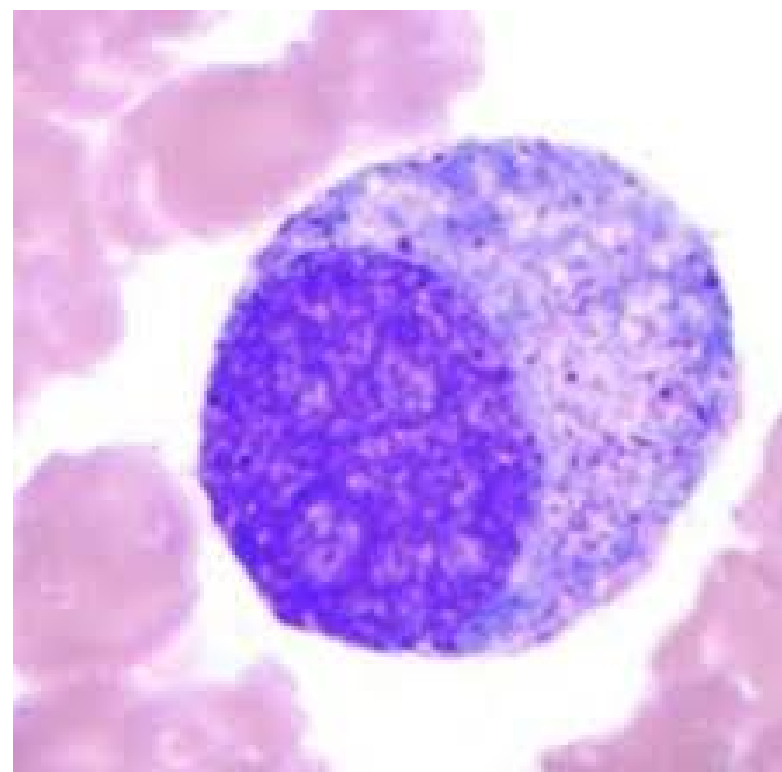
# NRBCs

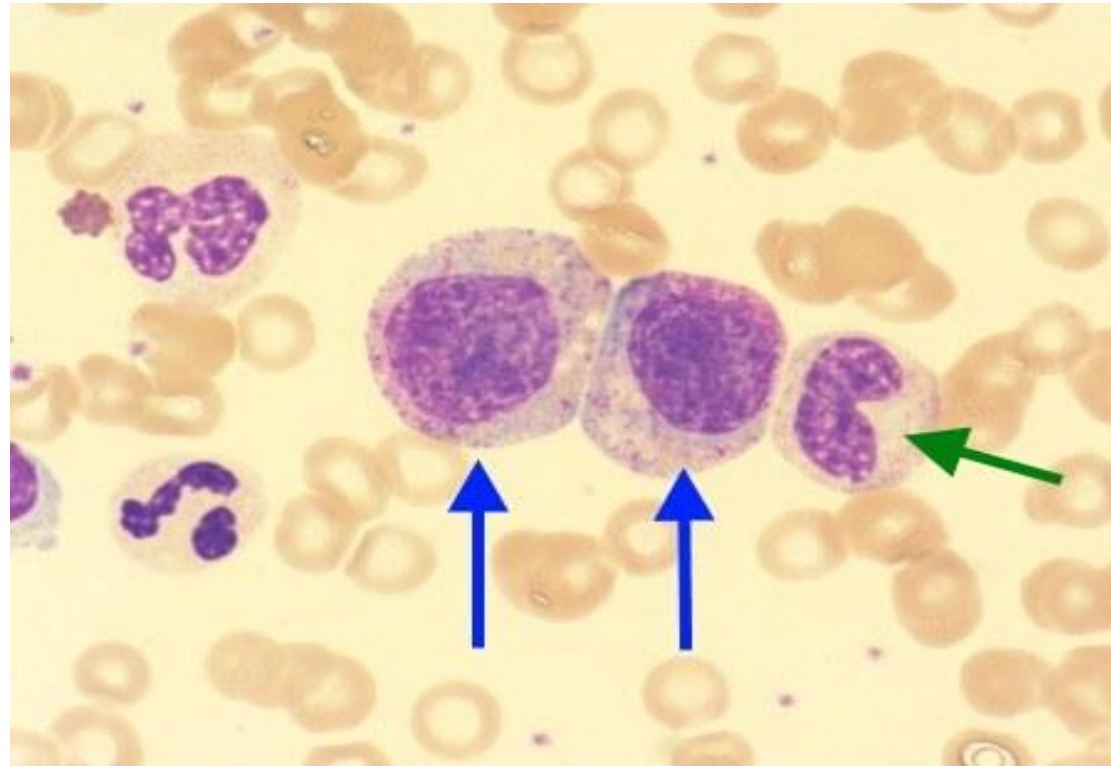
If 10 or more nucleated RBCs are seen correct the WBCs count  
using the formula:

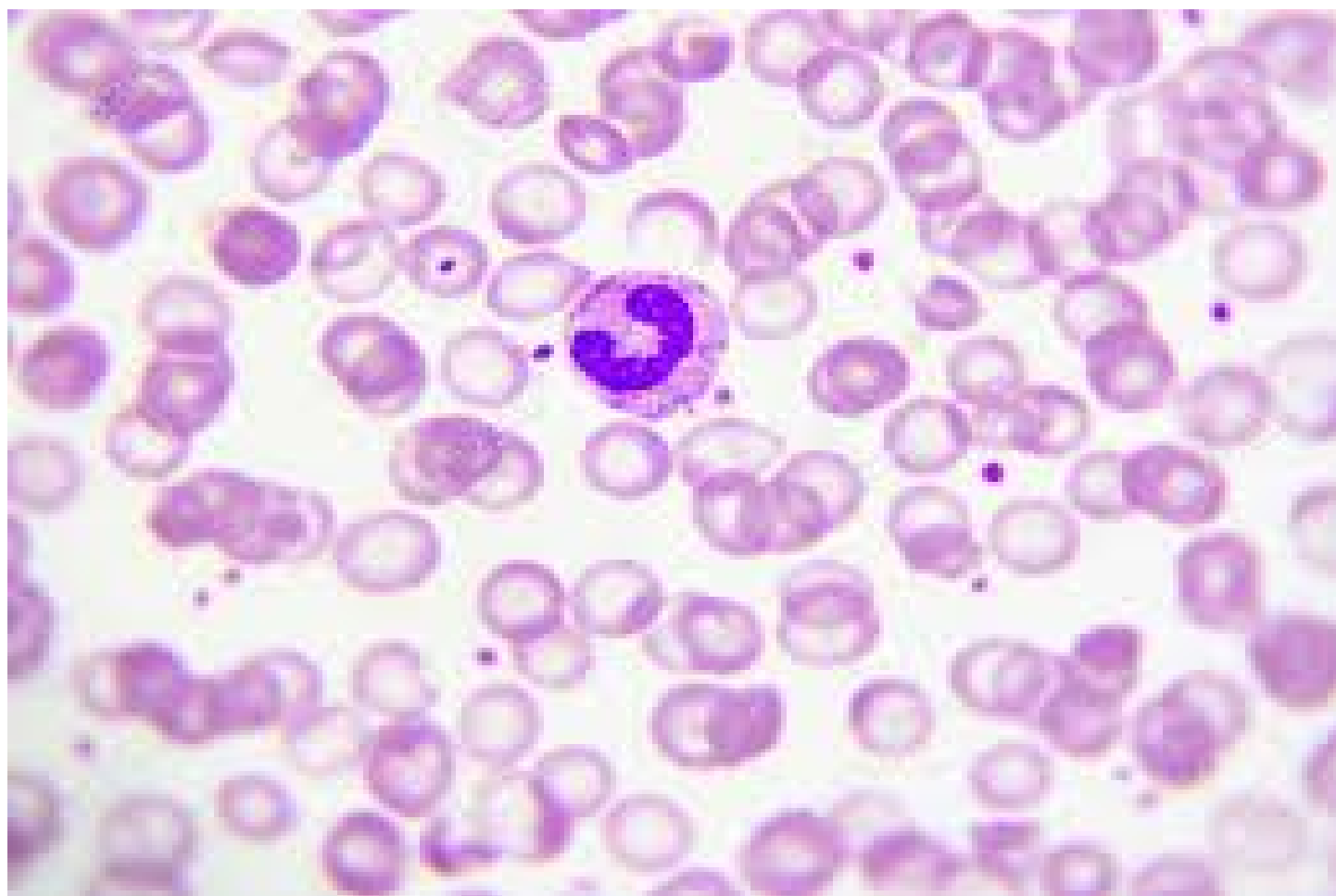
$$\text{Corrected WBC count} = \frac{\text{WBC} \times 100}{\text{NRBC} + 100}$$

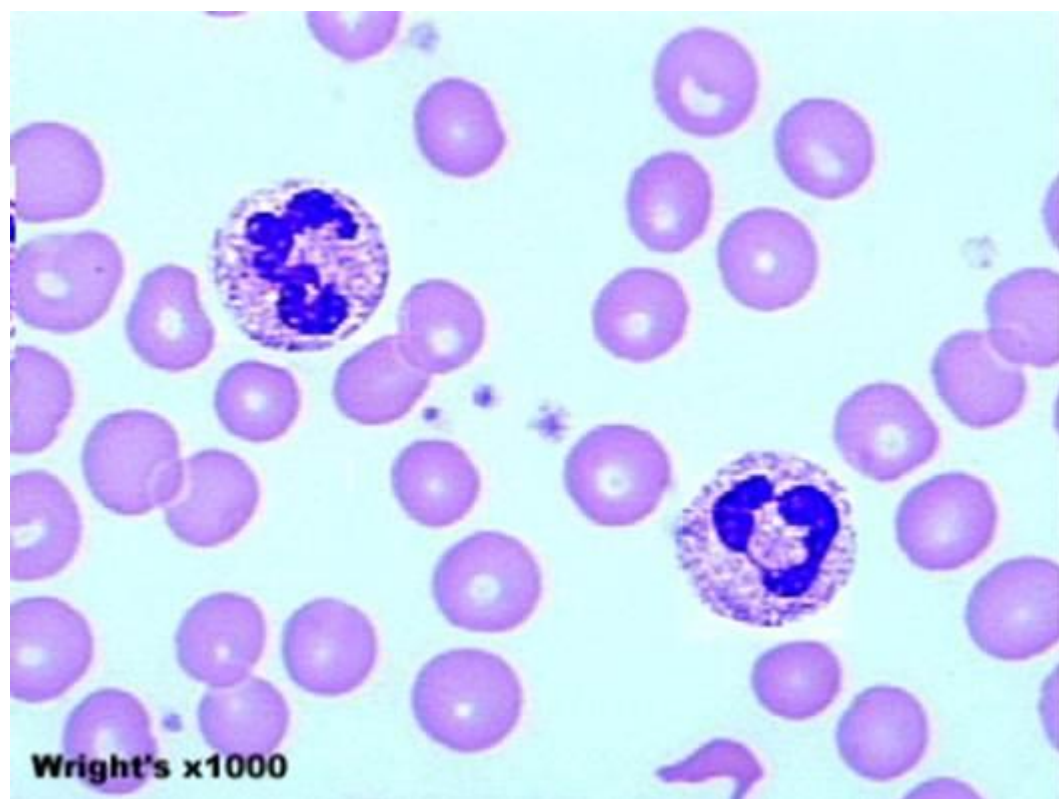


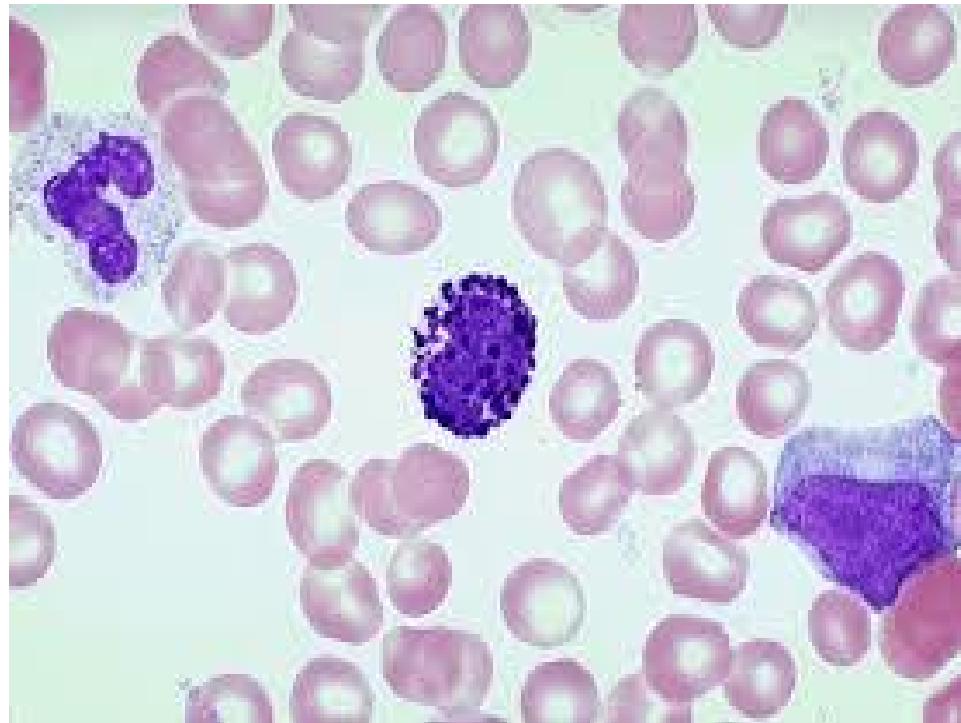
**Wadsworth Center**  
New York State Department of Health



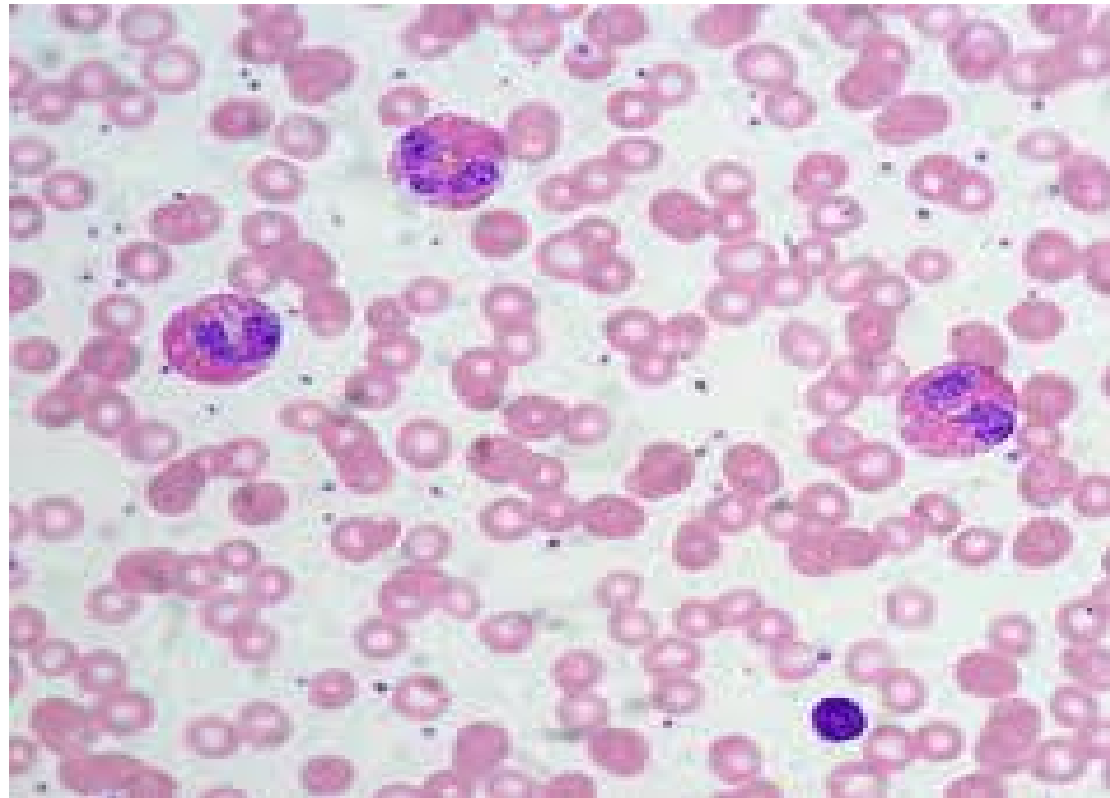


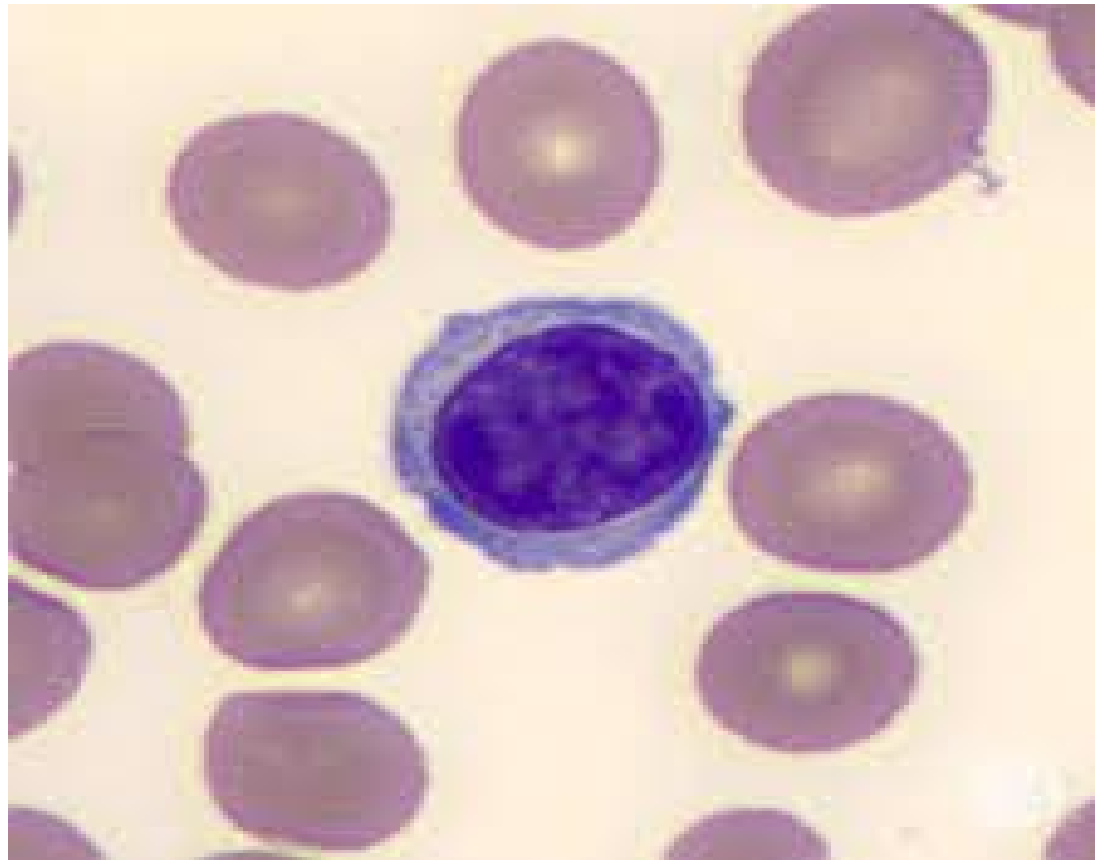


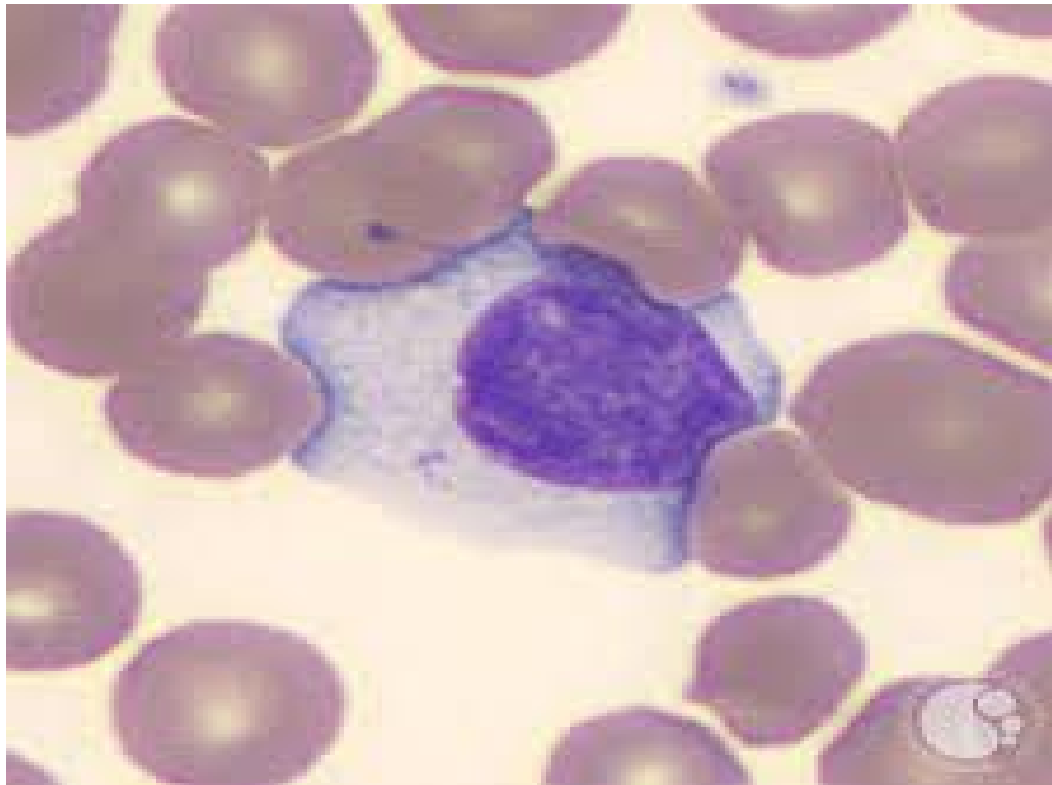


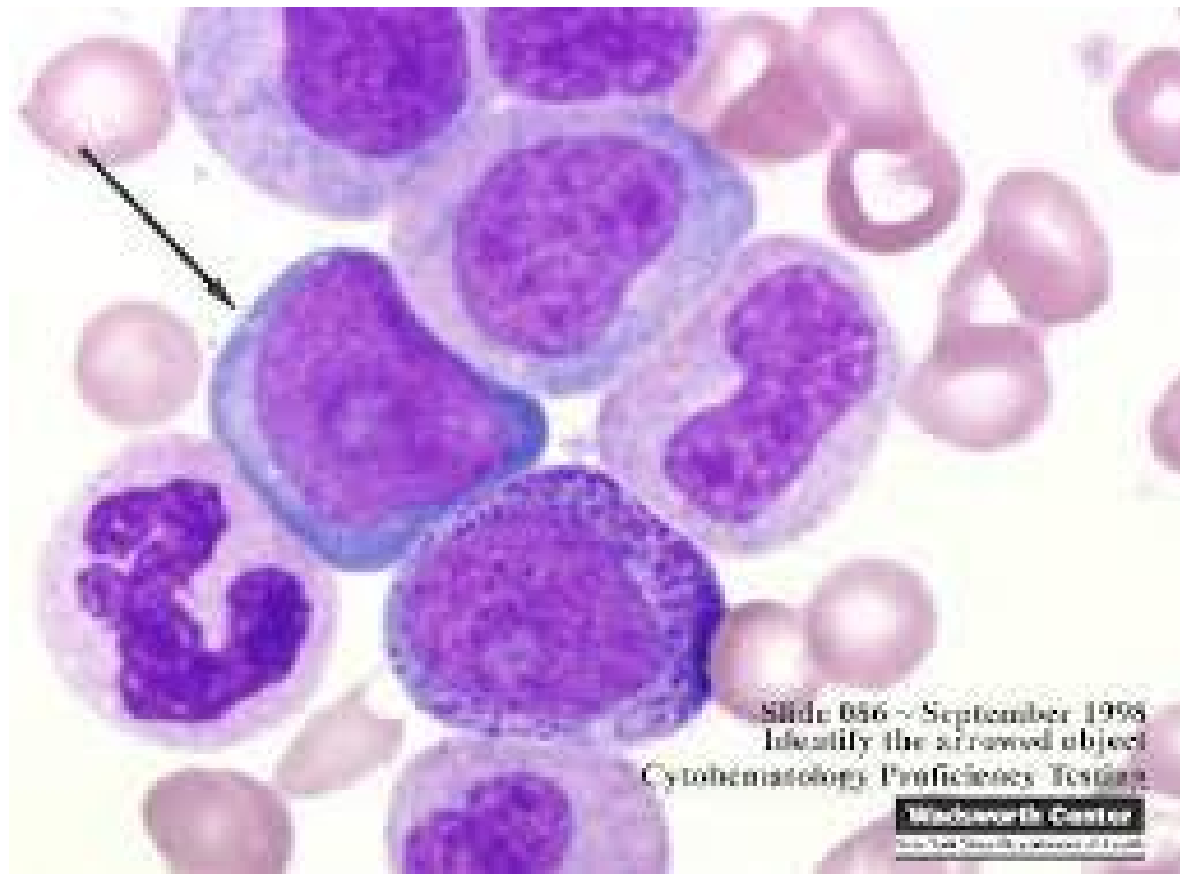


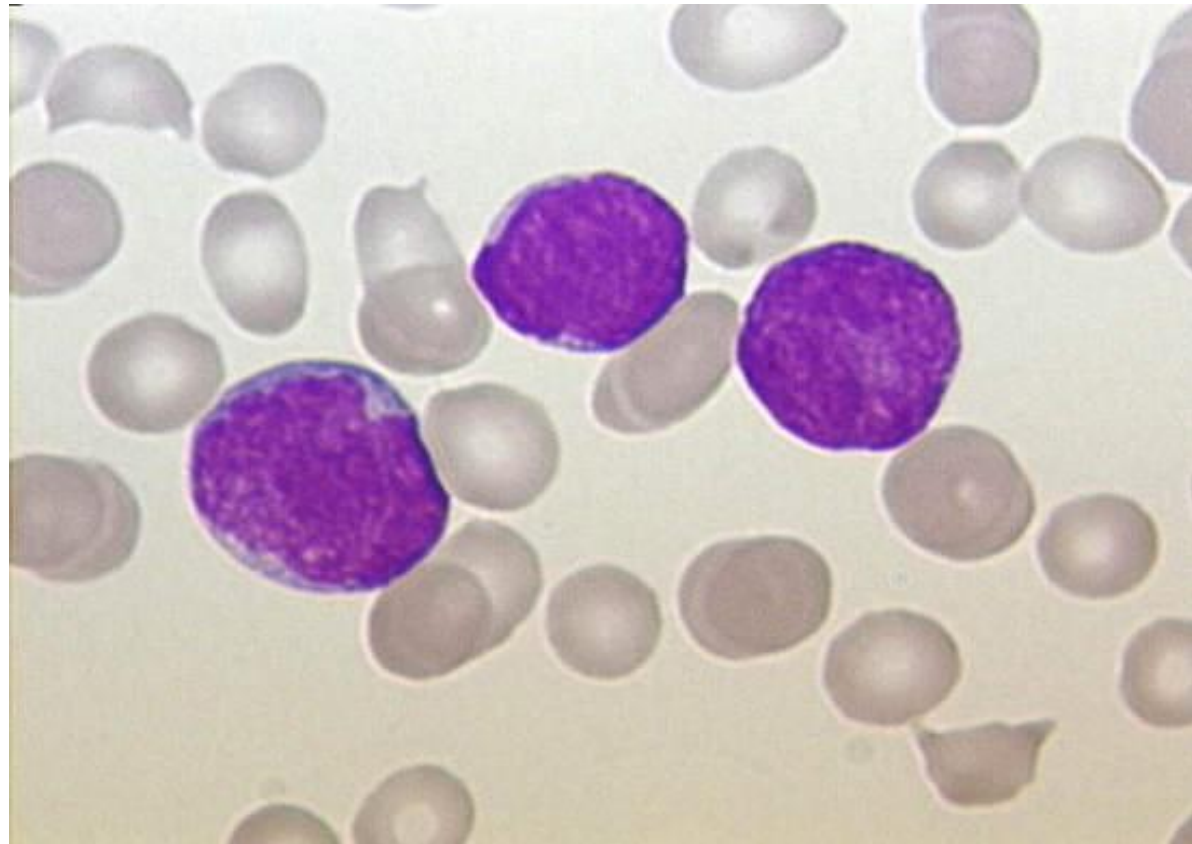


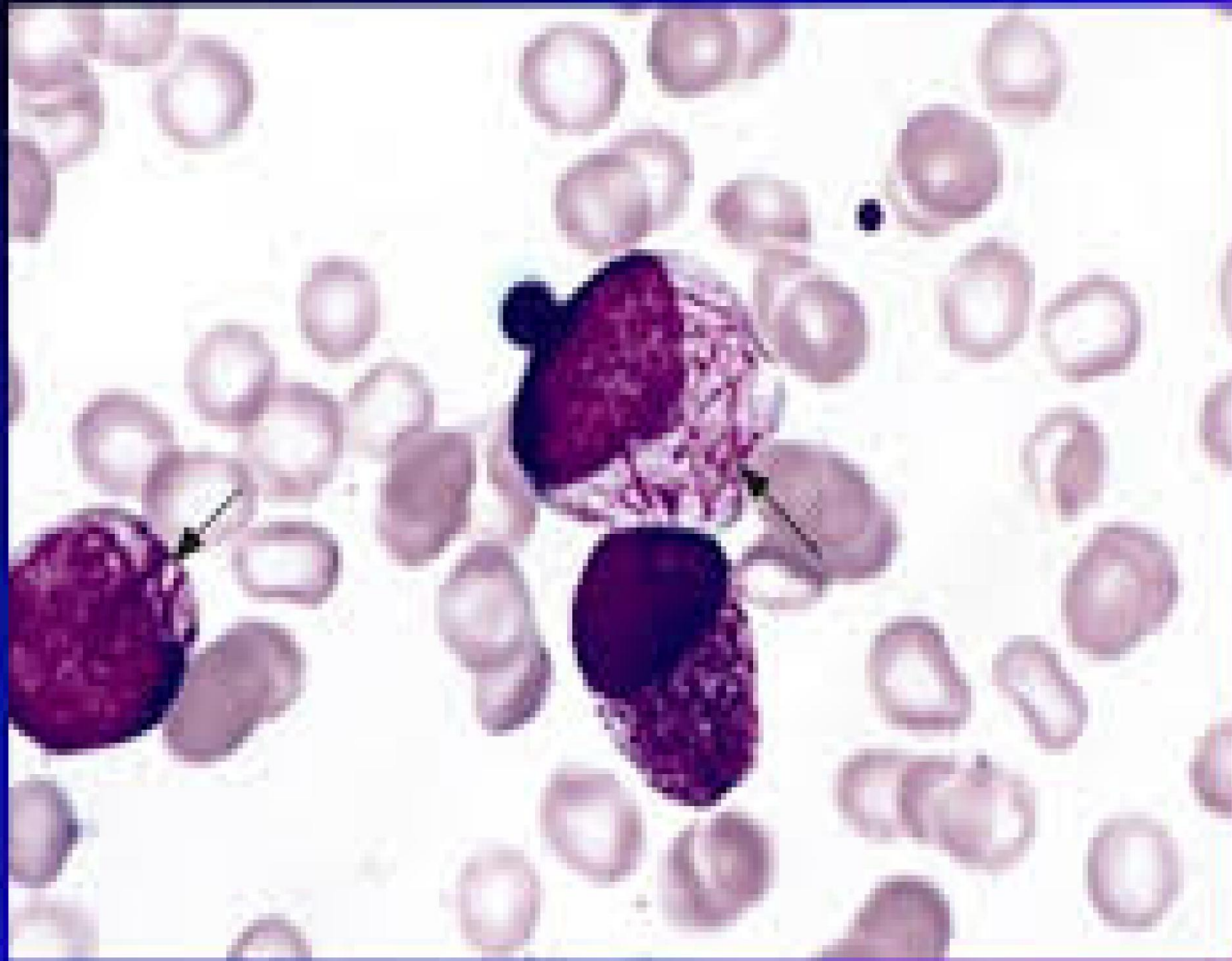


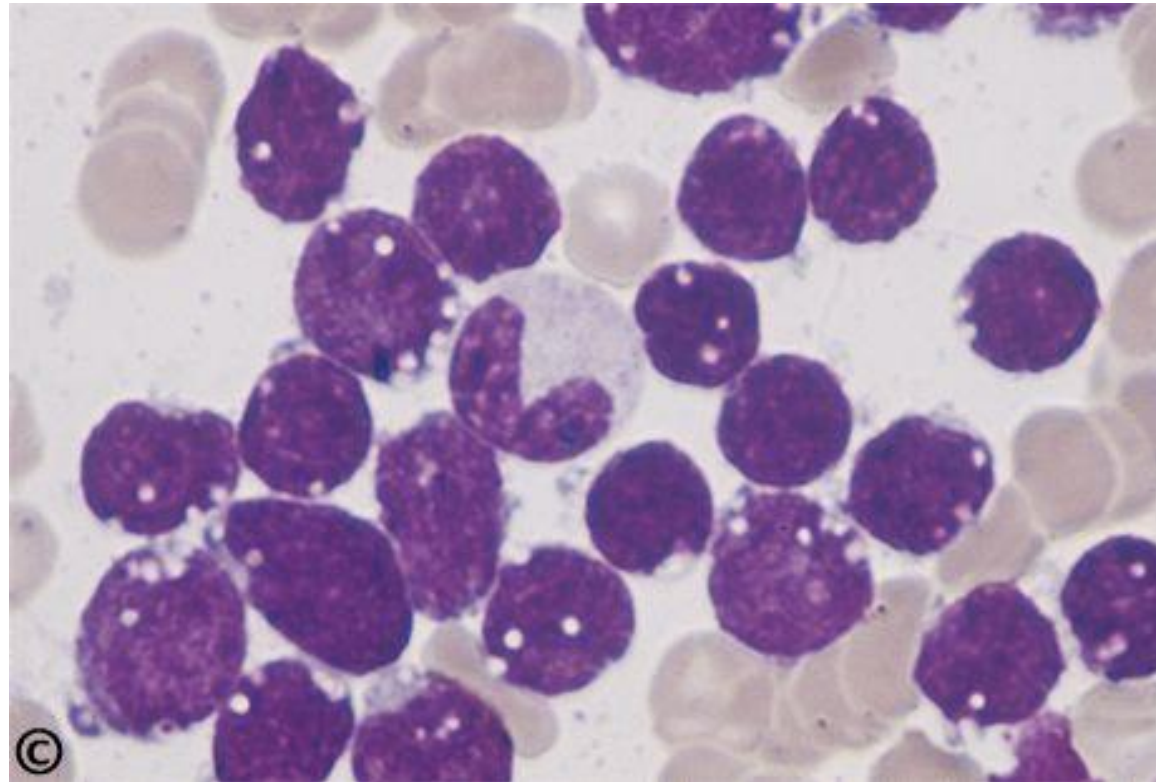


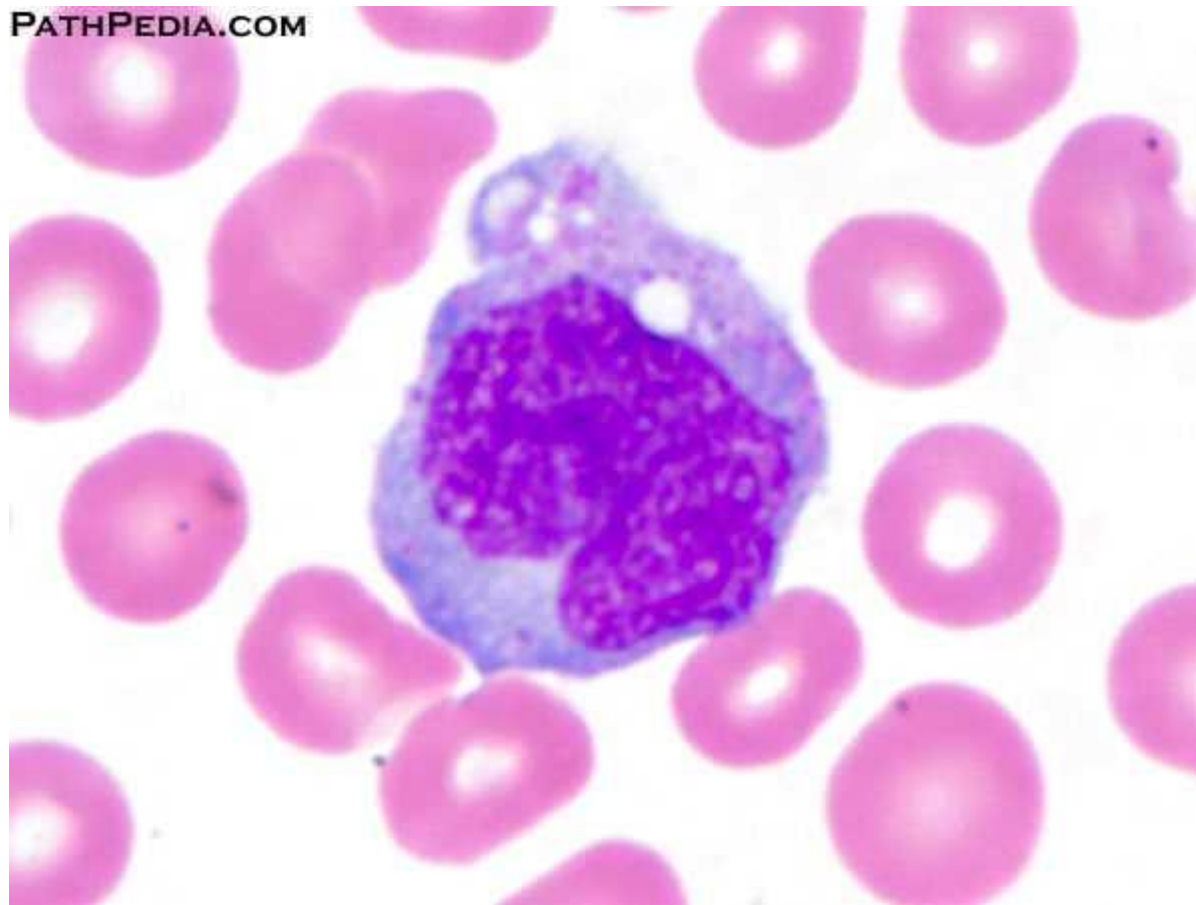




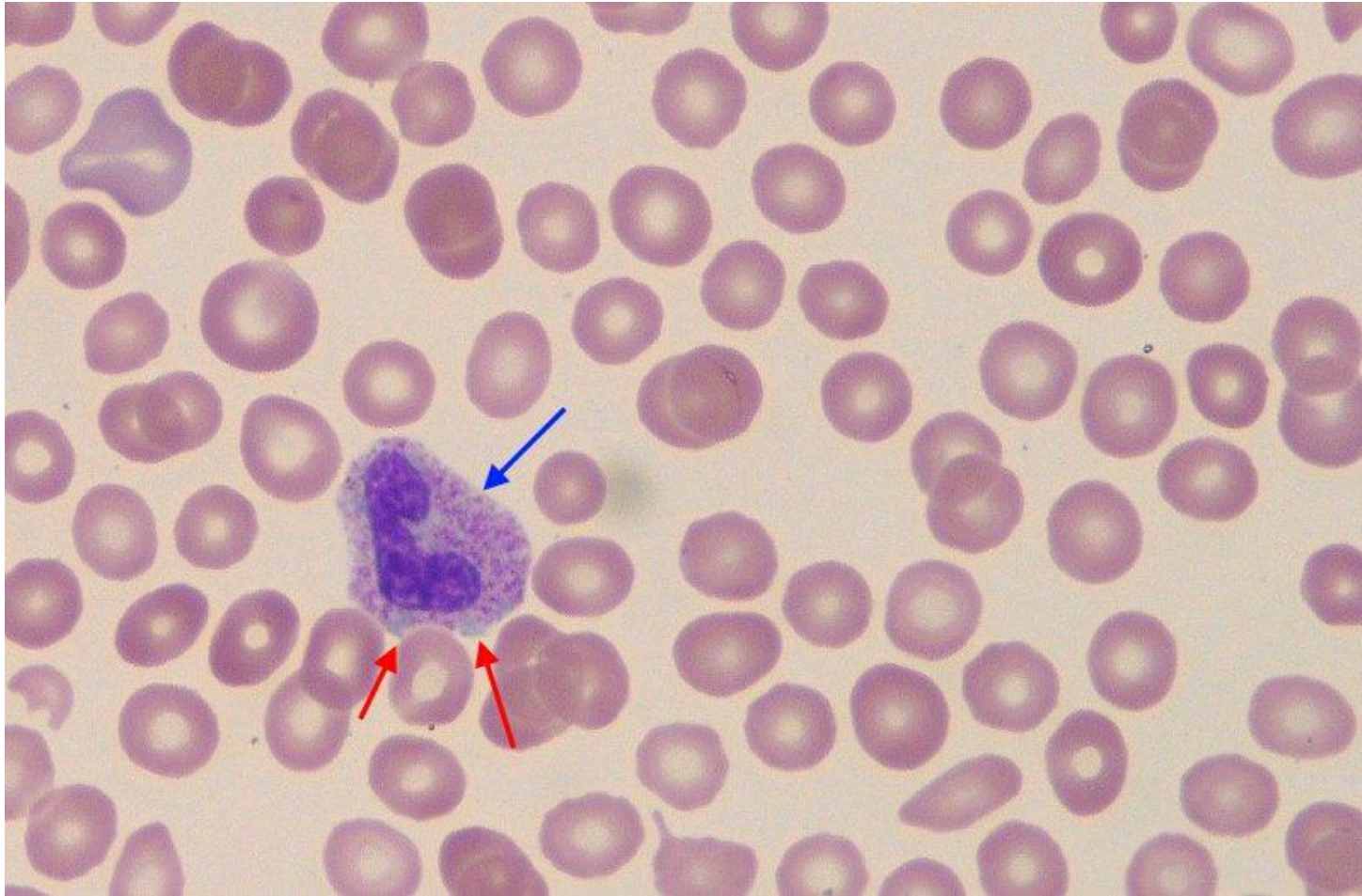


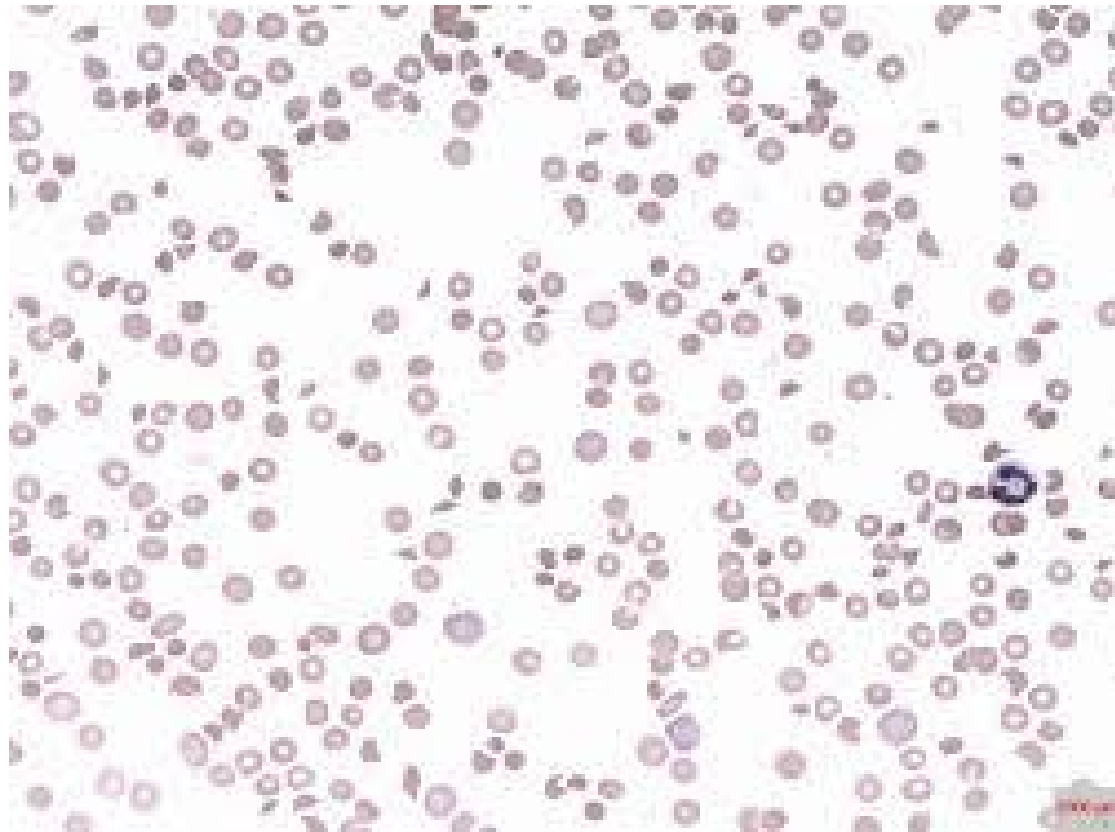


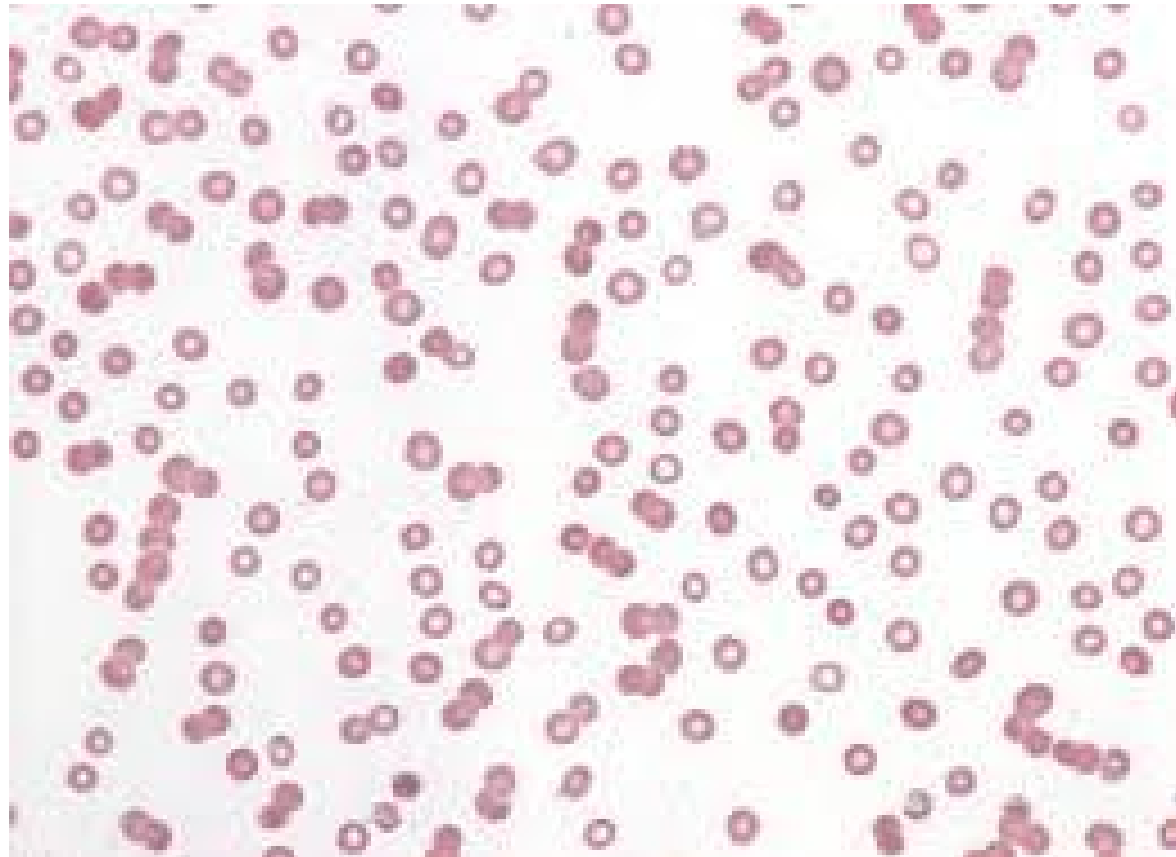












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