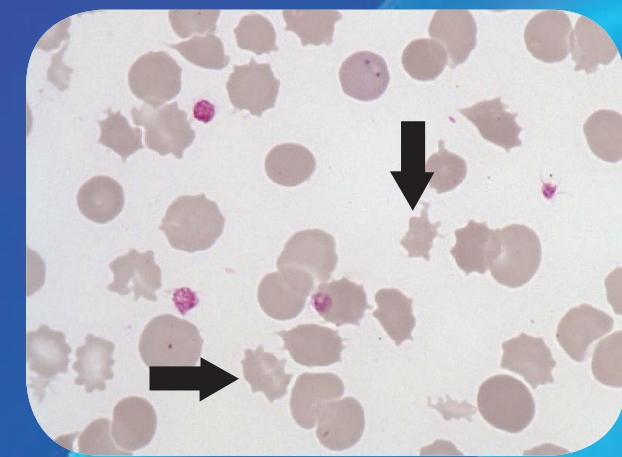
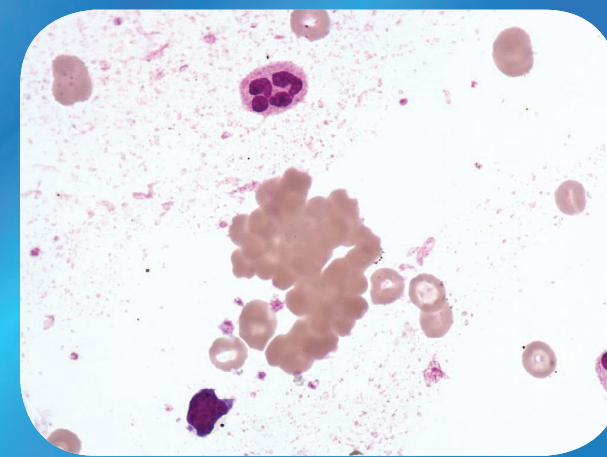


MORPHOLOGICAL ABNORMALITIES of Red Blood Cells

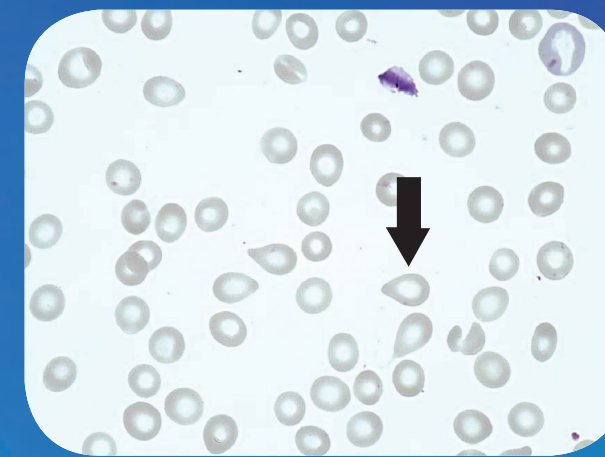
SHAPE AND MEMBRANE ANOMALIES



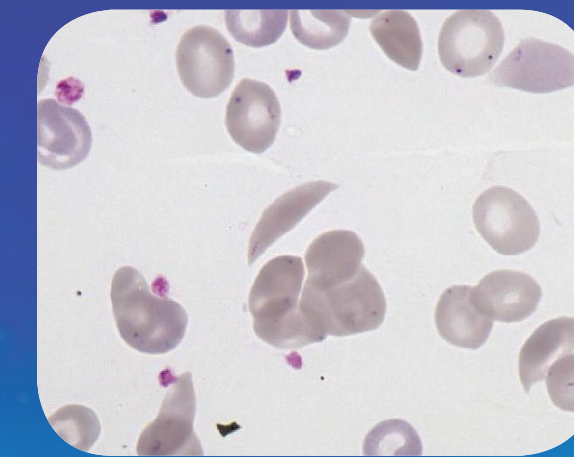
Acanthocytes
Size : about 1 RBC
Red blood cells with irregular cytoplasmic spicules.



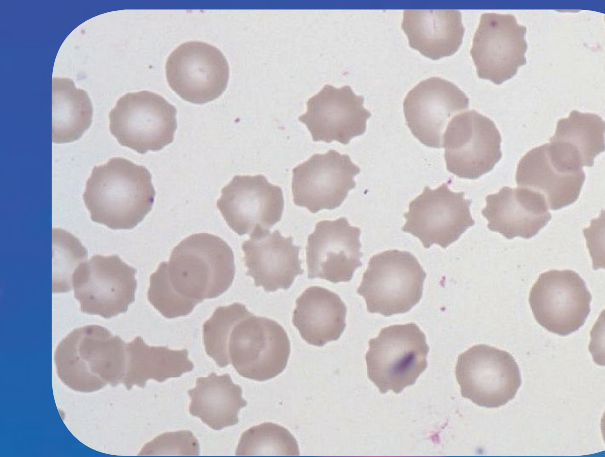
Autoagglutination
Agglutinated red blood cells in the blood smear.



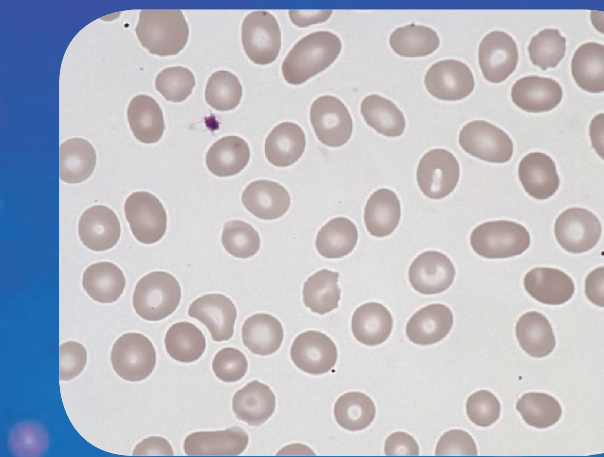
Dacryocytes
Red blood cells with extension tapered at one end, shaped like a tear or a pear (Teardrop RBC).



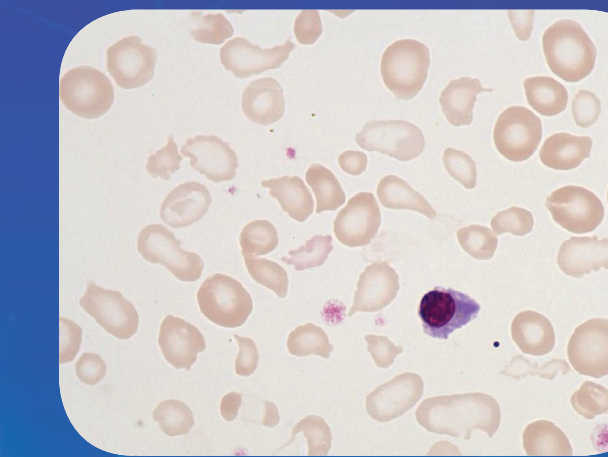
Sickle-cells
A genetic mutation causes the polymerization in long fibers of the Hemoglobin S in the RBC, that becomes sickle-shaped with pointed ends.



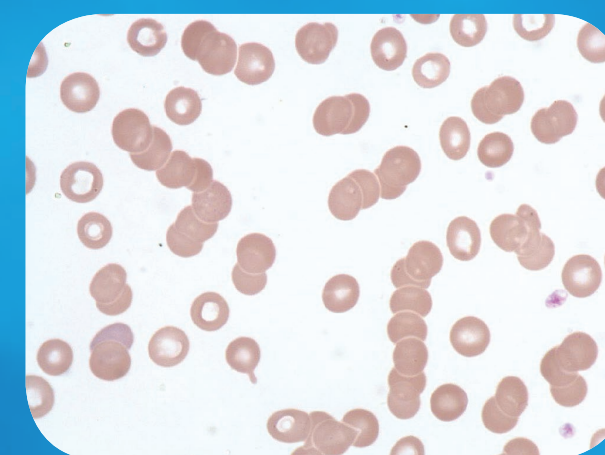
Echinocytes
Size : about 1 RBC
RBC with crenate borders (sea urchin-shape), covered with short blunt projections or spicules of fairly regular form.



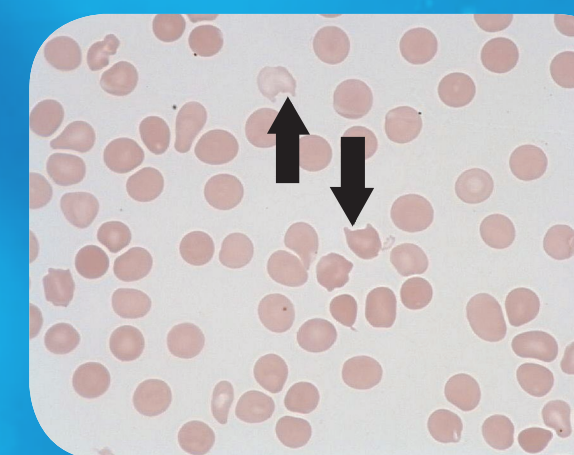
Elliptocytes
Red blood cells deformed assuming an elliptic shape.



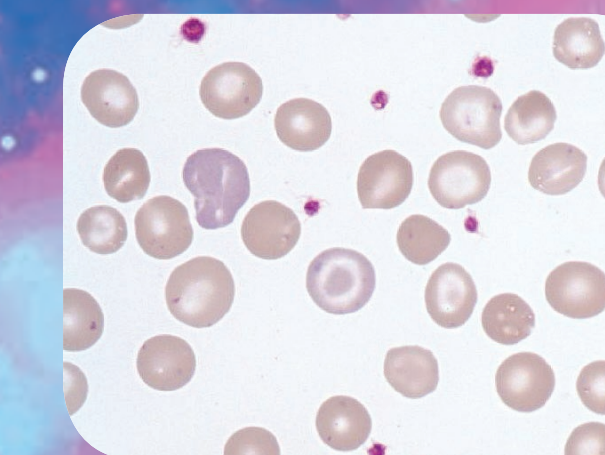
Poikilocytosis
Red blood cells of variable shapes.



Rouleaux
Red blood cells forming small clusters, «stacked» in columns, like «pile of dishes».



Schistocytes
Size : < 1 RBC
Red blood cell fragments of various shapes (such as triangular or helmet-shaped).

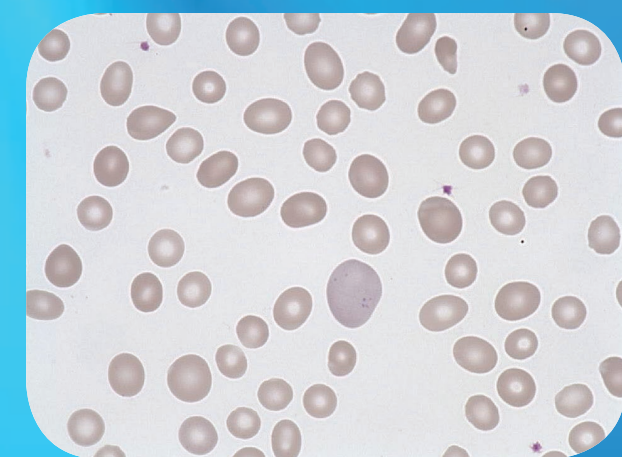


Target cells
Size : about 1 RBC
Red blood cell with three concentric area reflecting normal concentration Hb zones (center and periphery) and low concentration Hb zone (intermediate clear zone).

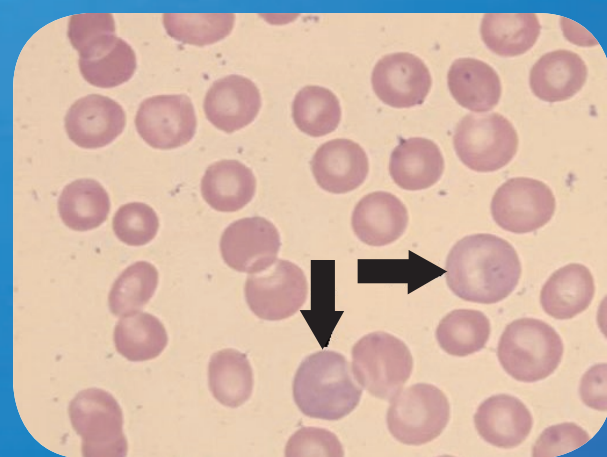


Stomatocytes
Mature RBCs with a slit-like area of central pallor.

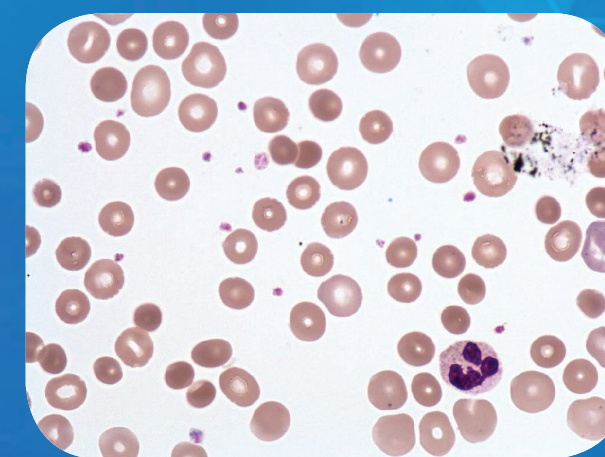
SIZE ANOMALIES



Anisocytosis
Red blood cells of variable size.

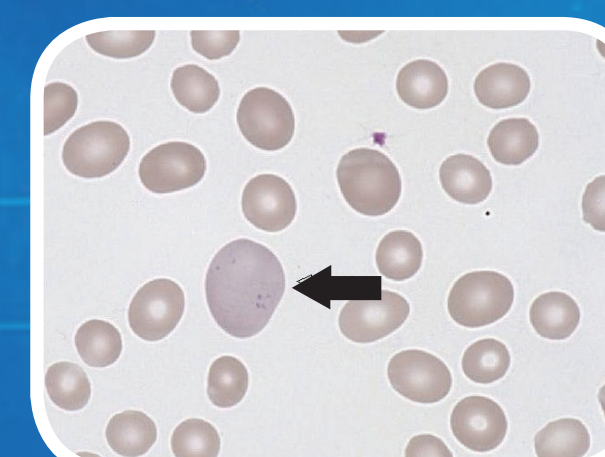


Macrocytosis
Size : > 100 fl
Increased mean erythrocyte volume (MCV > 100fL adults).



Microcytosis
Size : < 80 fl
Decreased mean erythrocyte volume (MCV < 80fL adults).

RETICULOCYTE

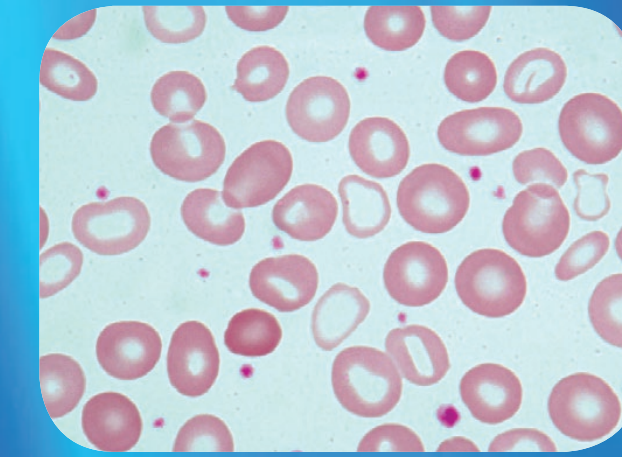


Reticulocyte
Size : > 1 RBC
Red blood cells of various bluish purple tinge. It may correspond to the presence of reticulocytes.

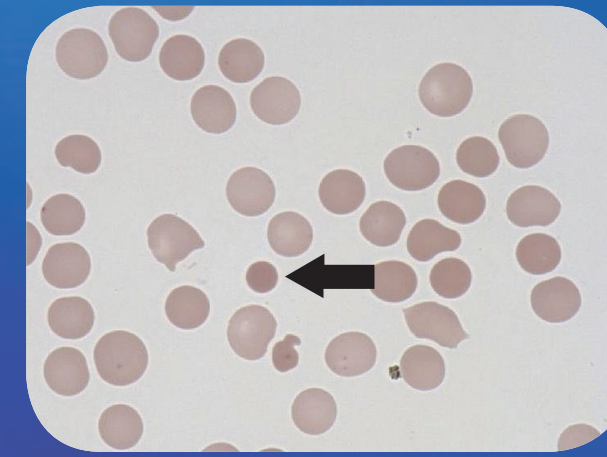


RET Count	
Technology	Flow-cytometry
Method 1	Impedance
Aperture diameter	60 µm
Method 2	Fluorescence
Optical source	Laser
Angle	90°

COLOR ANOMALIES



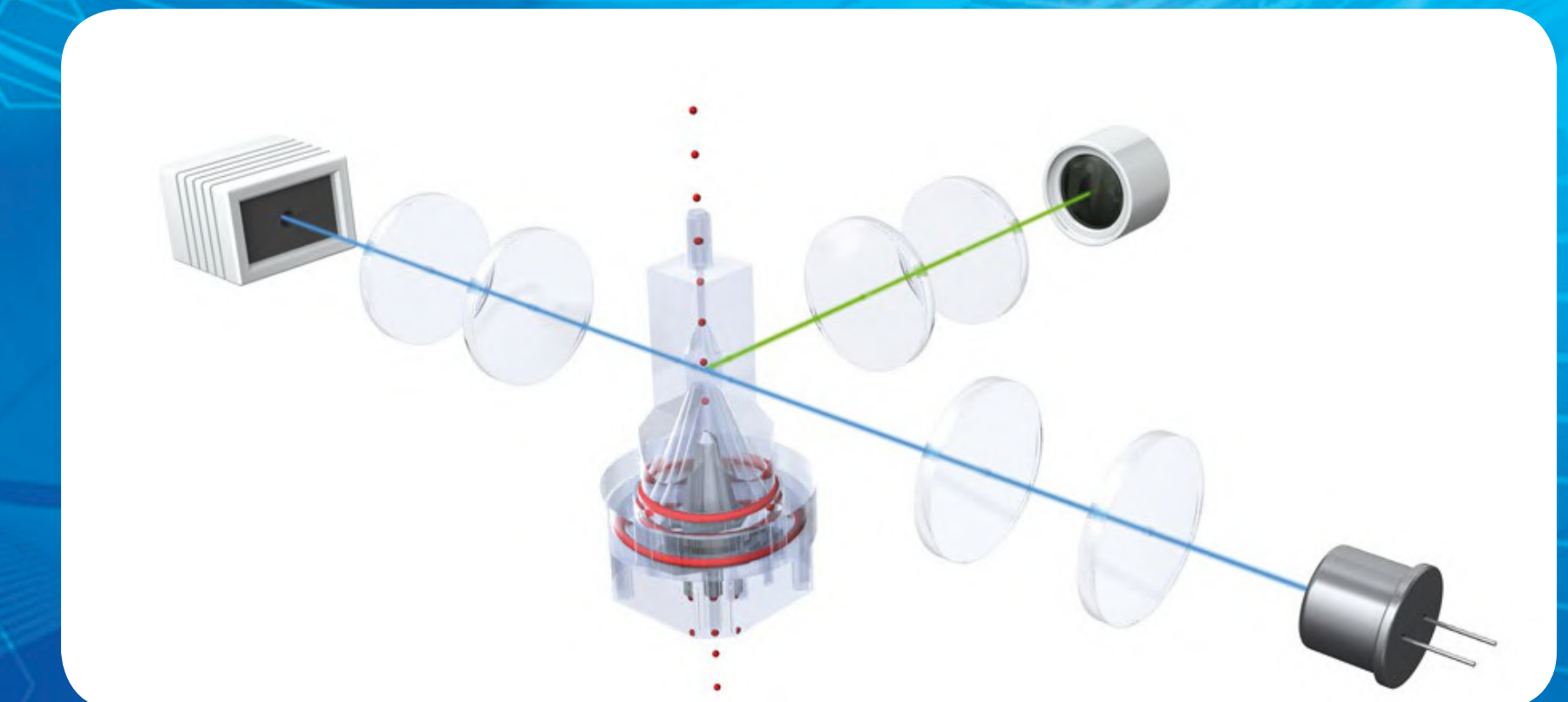
Anisochromia
Color variation of red blood cells indicating a change in the hemoglobin content of one red blood cell to another.



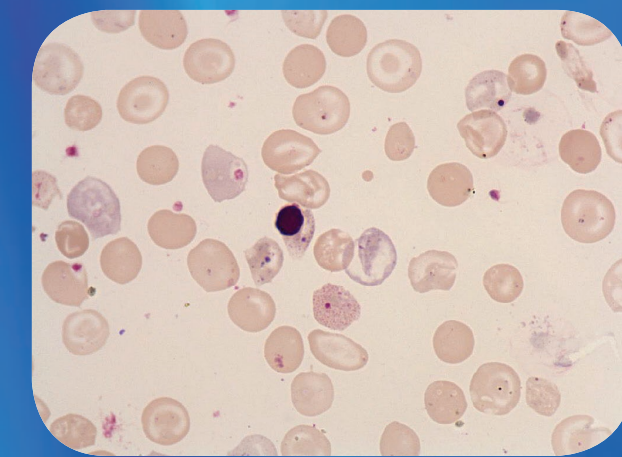
Spherocyte
Size : < 1 RBC
Very dense, spherical RBC, sometimes with small loss of central clear zone.

For every cell passing through the flowcell, the laser optical bench measures:
- the volume of the cell (**Cell Impedance Signal**),
- the fluorescence signal (**Orthogonal Fluorescence Light**).

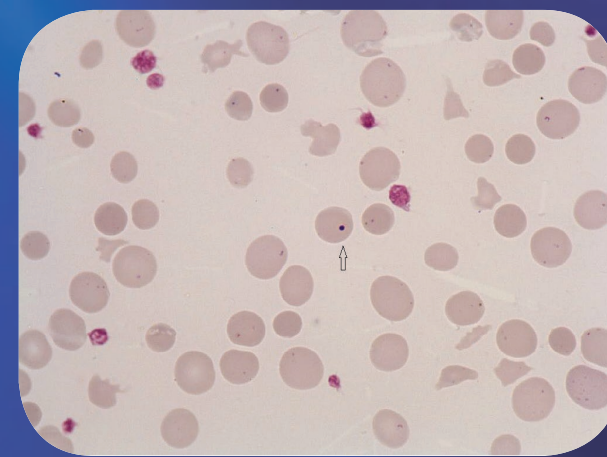
OFL: The fluorescence is collected using:
- a lens focused on the optical flowcell and located at 90° from the laser beam.
- an interferential filter specific to the **Thiazol orange Fluorochrome** selecting only the fluorescent wavelength.
- an **avalanche photodiode**.



INCLUSIONS



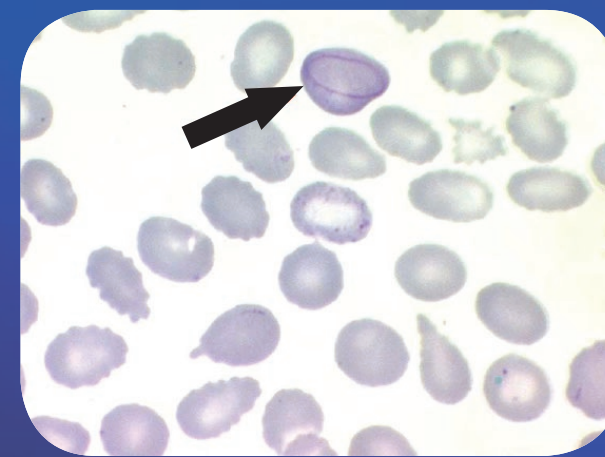
Basophilic stippling
Various and fine intracytoplasmic granules.



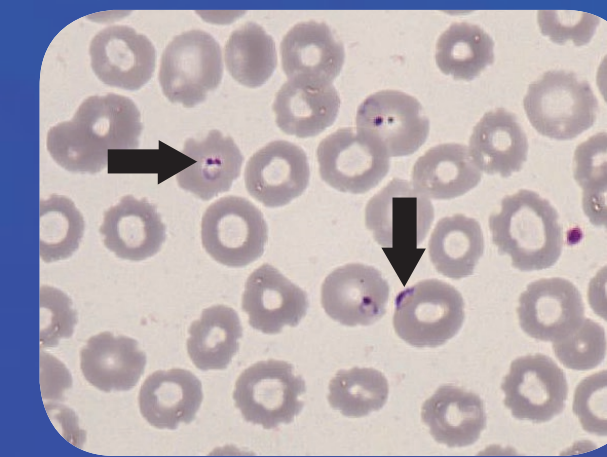
Howell Jolly Bodies
Size : 1 µm
Dark purple intra-erythrocytic corpuscle (MGG staining) of spherical shape.



Pappenheimer Bodies
Appear as dense, blue-purple granules within the red blood cell and there are usually only one or two, located in the cell periphery



Cabot Ring
Red-violet staining, threadlike strands in the shape of a loop or figure-8 that are found on rare occasions in red blood cells (erythrocytes)



Malaria
Intraerythrocytic presence of trophozoites of Plasmodium.

