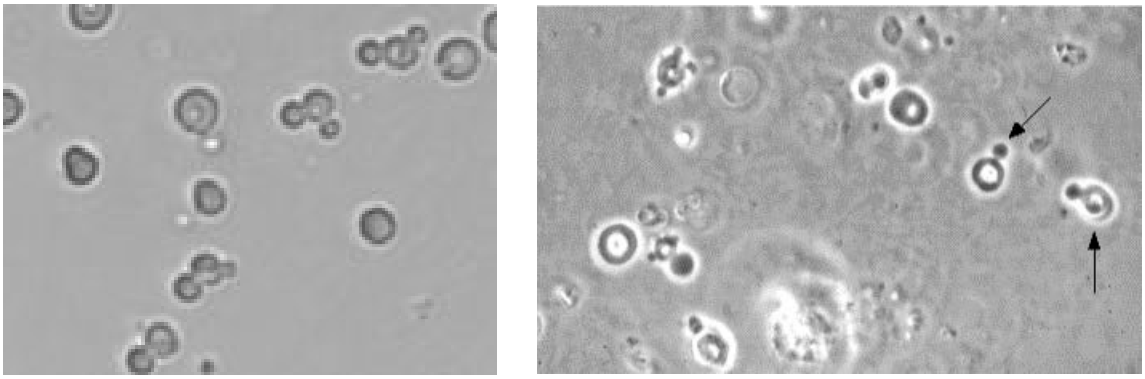
DYSMORPHIC RED BLOOD CELLS

NORMAL RED BLOOD CELLS

Red cells in urine are similar to those seen in other fluids with a uniform size, biconcave disc shape and a pale pink or yellow-orange color when viewed under brightfield illumination. In hypotonic specimens, or sometimes in specimens where analysis is delayed, the hemoglobin pigment is lost, and the red cells appear colorless ("ghost cells").

DYSMORPHIC RED BLOOD CELLS

A morphologic variant of the red cell, DYSMORPHIC red cells are usually smaller than red blood cells and have cytoplasmic bulges and projections that may break off and appear as tiny separate red cell fragments. The classic example of this type of cell is one with two small symmetrically positioned cytoplasmic blebs…like "Mickey Mouse ears". Dysmorphic cells can be seen with brightfield imaging, but may be seen more easily with phase.

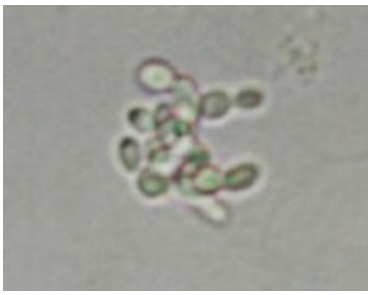


DYSMORPHIC RED BLOOD CELLS (BF, left and PHASE, right)

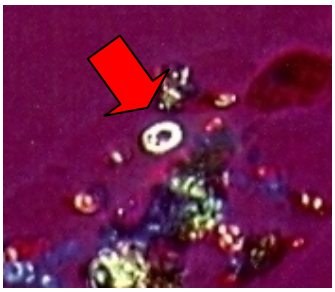
It's thought that the morphologic changes in the red cells are caused when red blood cells are allowed to cross the damaged glomerular membrane and move into Bowman's space. (→)

Dysmorphic red blood cells may also be seen in patients with other intrinsic renal disorders, such as pyelonephritis, polycystic disease, and rhabdomyolysis with renal failure. They can also be produced as a result of kidney biopsies or renal tumors. It's worth noting that high concentrations of uric acid can also induce dysmorphic red blood cell morphology. That being said, recognition of dysmorphic red blood cells are important as a sign of serious renal pathology. It's also important not to confuse them with yeasts, calcium oxalate crystals, free fat globules or other similar structures.

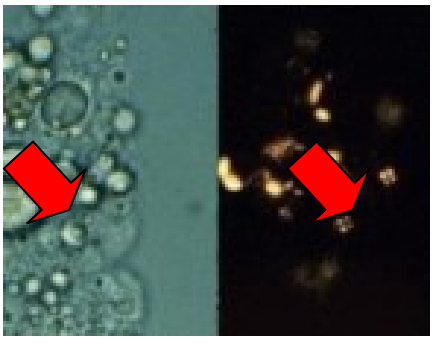
RED BLOOD CELLS WILL LYSE WITH ACETIC ACID!! This is a quick and easy way to differentiate RBCs and dysmorphic RBCs from other look-alikes, such as yeast or fat globules.



← Yeast will not lyse with acetic acid.



← Ovoid calcium oxalate is BIREFRINGENT.
↓ RBCs are not.



← Fat globules will show a characteristic "MALTESE CROSS" with polarized light.

You may identify dysmorphic RBCs in the iQ (DRBC), but the IRIS reports dysmorphic red cells as a percent of the total RBCs. The result will not transmit to LIS. We will report dysmorphic RBCs as PRESENT/ABSENT after manual review.