

The background of the slide is a laboratory setting. In the foreground, there is a beaker with a red cap containing a yellow liquid. In the background, a rack of test tubes is visible, some containing orange and some yellow liquids. The lighting is bright and clinical.

MINI ATLAS **URINALYSIS** Urinary Sediment

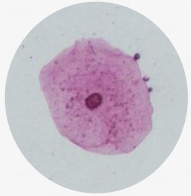
HOW WILL THIS **MINI ATLAS** HELP YOU?

With it, it is possible to consult the images of the structures of the urinary sediment in high resolution and visualize the elements through microscopy and staining resources.



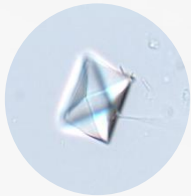
Consult the digital version of the atlas for
enlargement of the images

Summary



CELL ELEMENTS

04-09



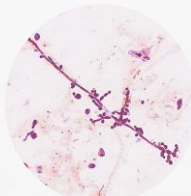
CRYSTALS

10-16



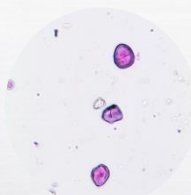
CYLINDERS

17-20



MICROORGANISMS

21-22



OTHER ELEMENTS

23-24

CELL ELEMENTS



- ➔ Squamous epithelial cell.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).



- ➔ Transitional epithelial cell (superficial).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CELL ELEMENTS



- ➔ Transitional epithelial cell (deep).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

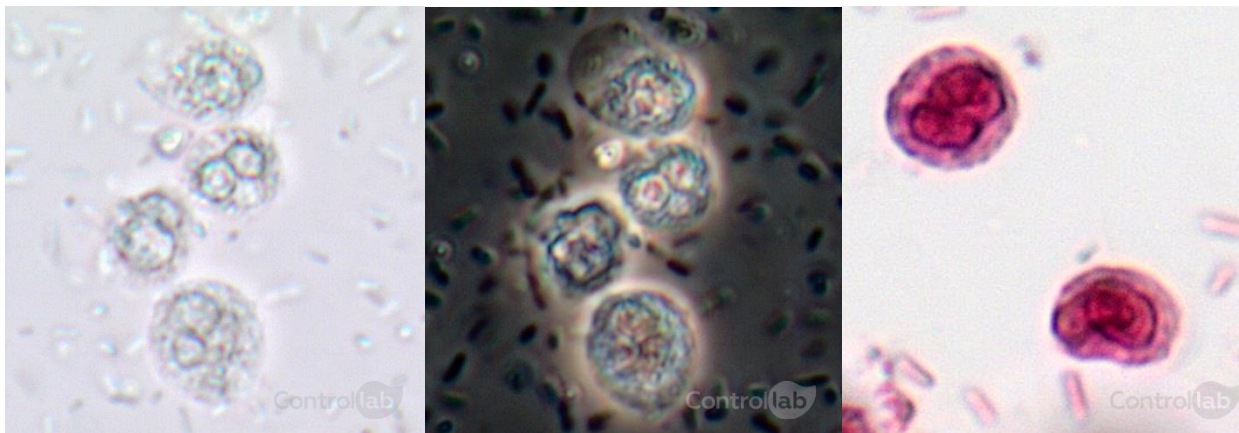


- ➔ Renal tubular epithelial cell.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CELL ELEMENTS



- ➔ Decoy cell.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

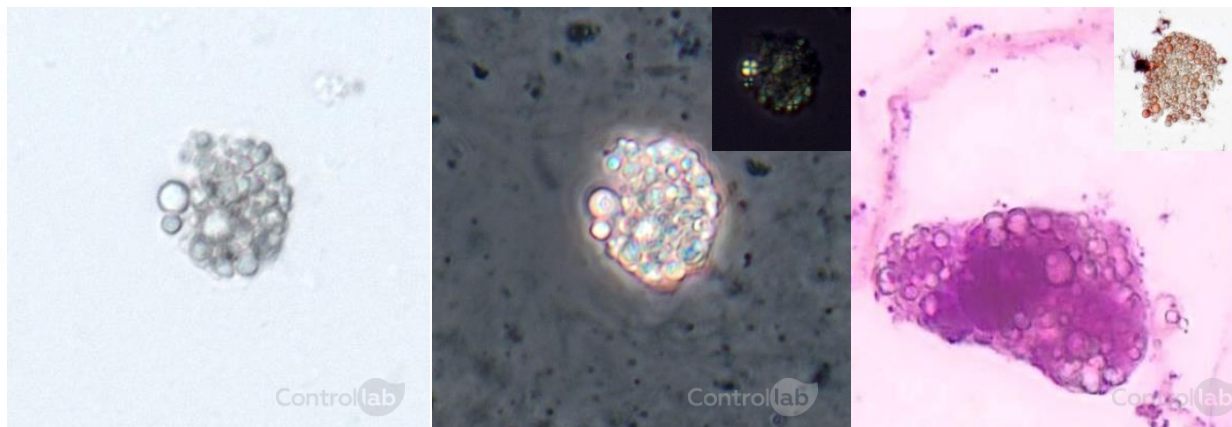


- ➔ Leukocytes.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CELL ELEMENTS

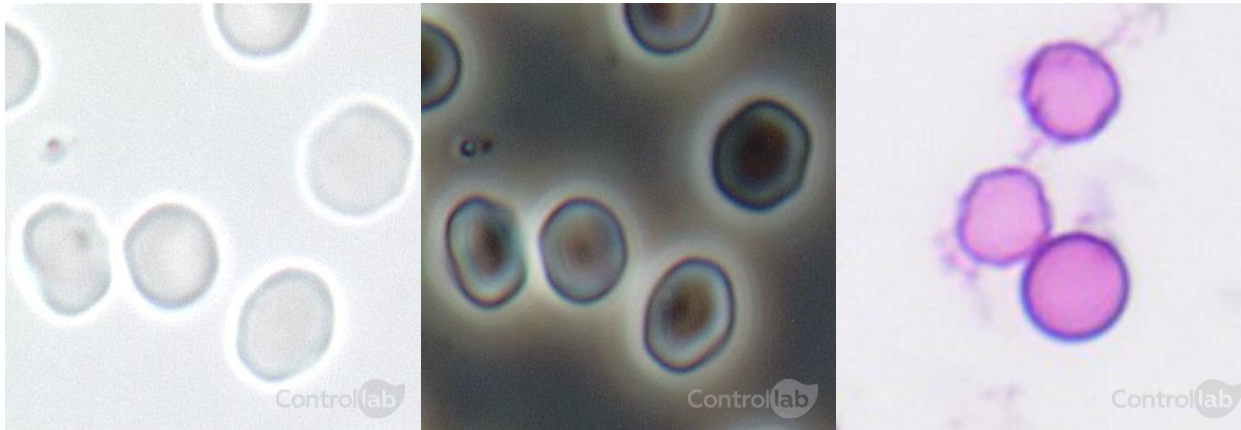


- ➔ Macrophage
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

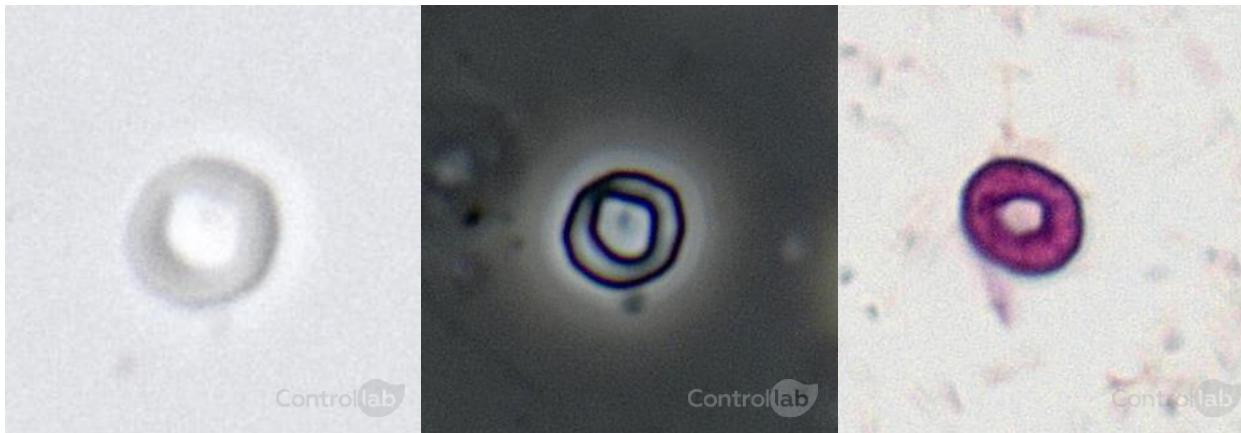


- ➔ Oval fatty body.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center) and Polarized light microscopy (upper right corner of center image).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right) and brightfield microscopy with Sudan staining (upper right corner of right image).

CELL ELEMENTS

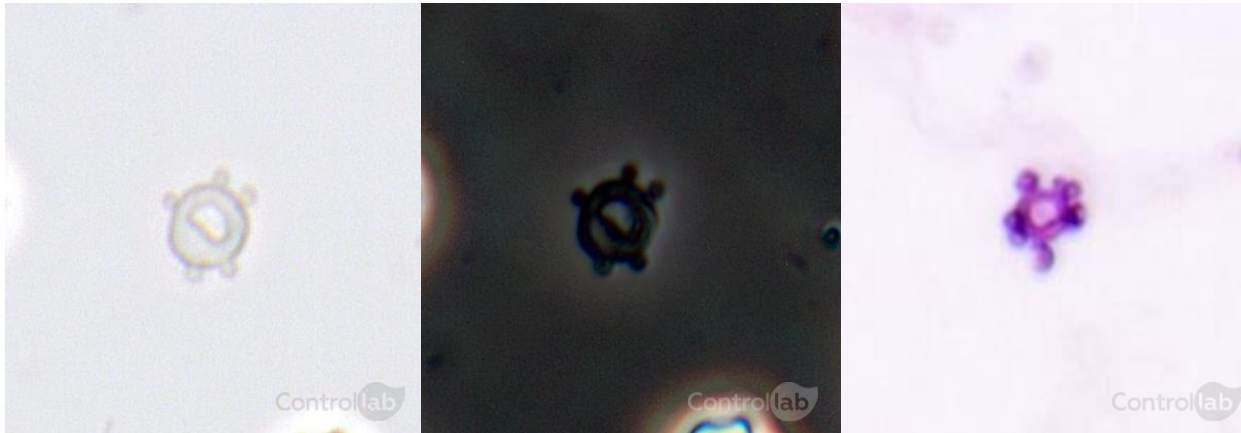


- ➔ Normal erythrocytes (isomorphic).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).



- ➔ Dysmorphic erythrocyte.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CELL ELEMENTS

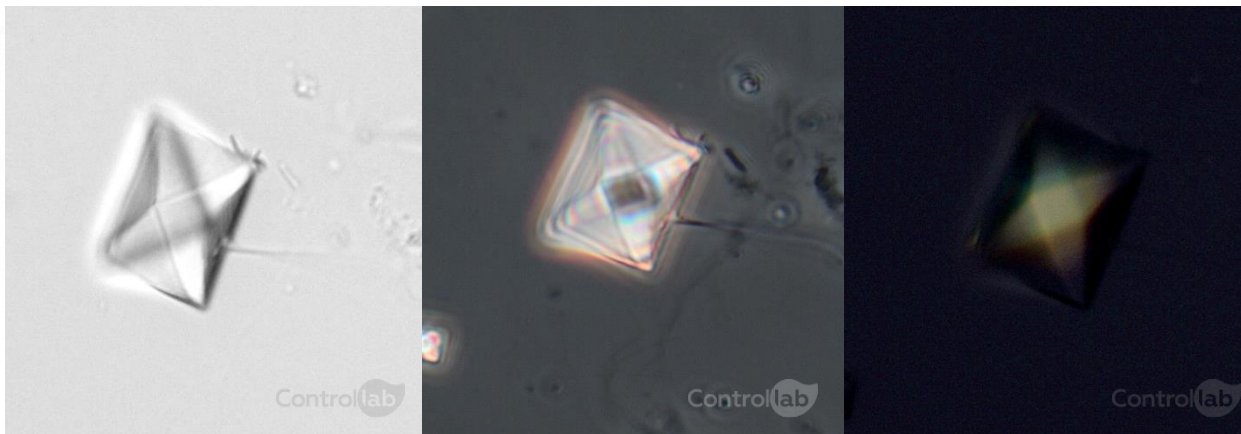


- ➔ Dysmorphic erythrocyte (Acanthocyte).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CRYSTALS



- Uric acid crystals.
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

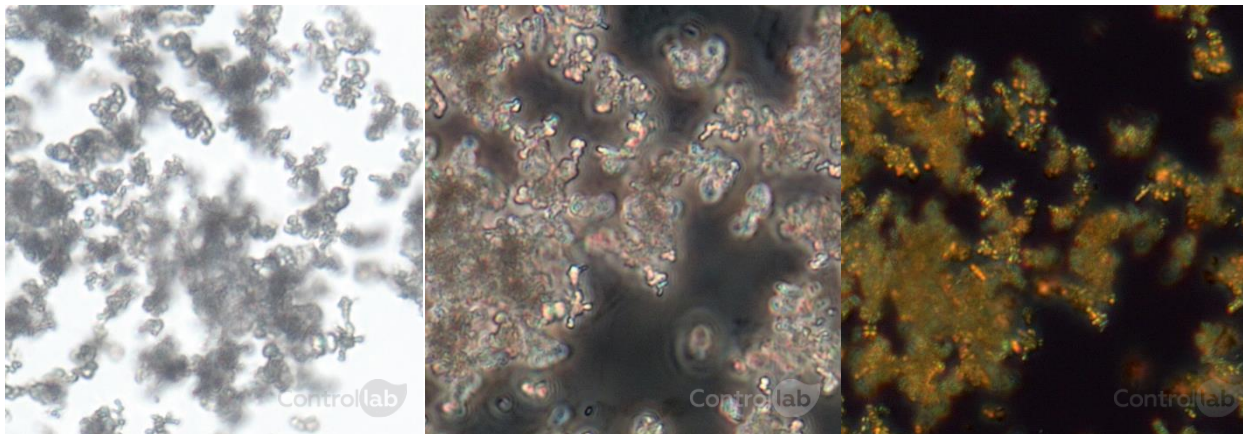


- Crystal of calcium oxalate dihydrate.
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

CRYSTALS

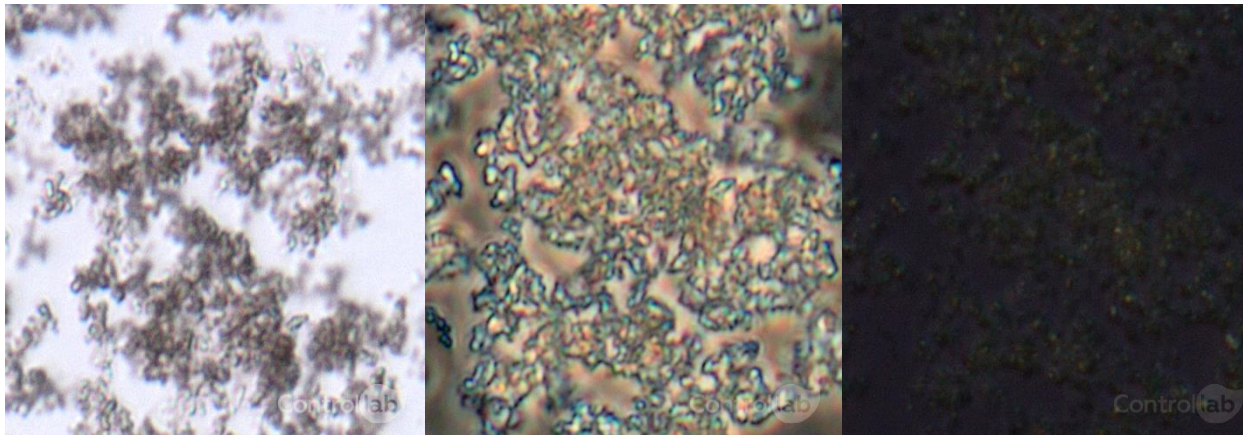


- ➔ Crystals of calcium oxalate monohydrate.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).



- ➔ Amorphous urate granules.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

CRYSTALS

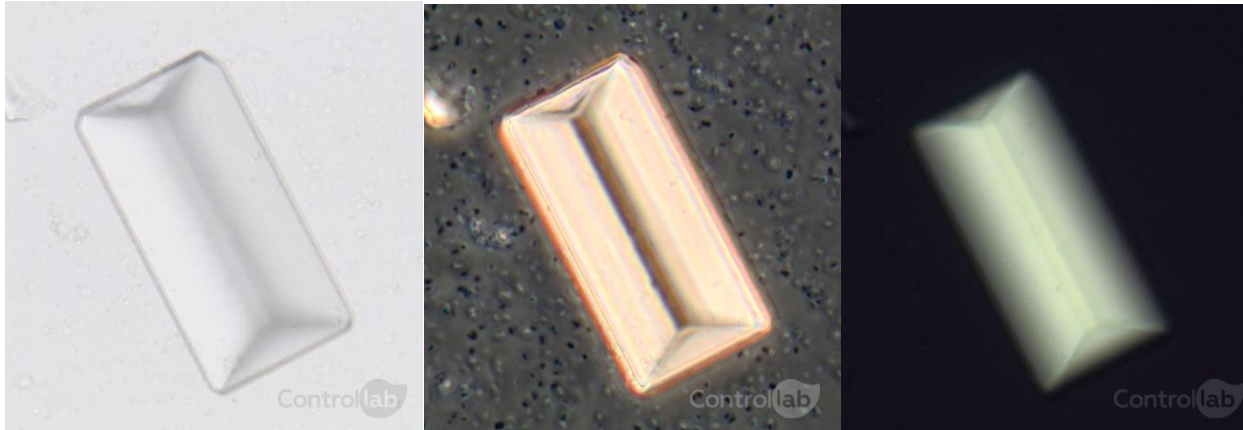


- ➔ Amorphous phosphate granules.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).



- ➔ Calcium phosphate crystals.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

CRYSTALS

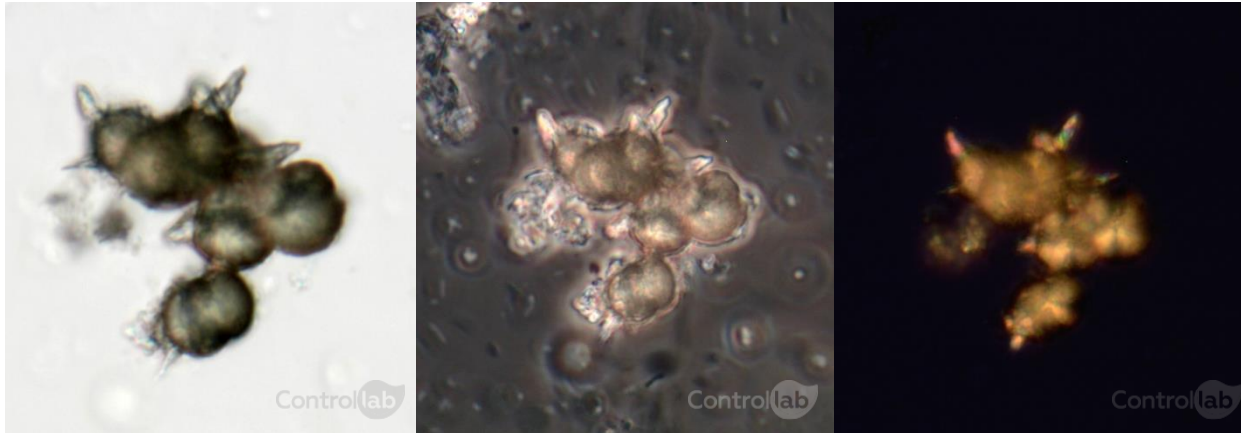


- Ammonia-magnesian triple phosphate crystal.
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

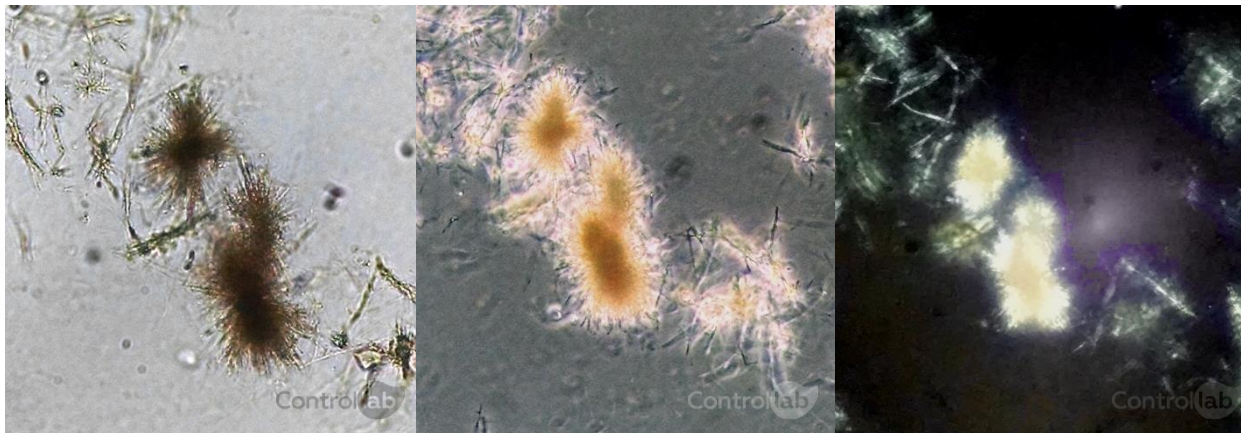


- Calcium carbonate crystals.
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

CRYSTALS

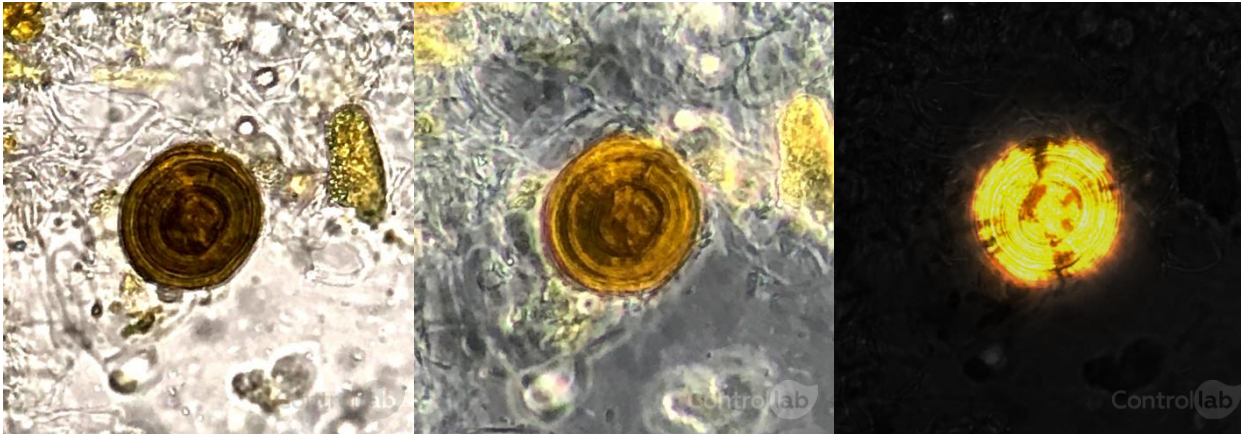


- ➔ Ammonium biurate crystals.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

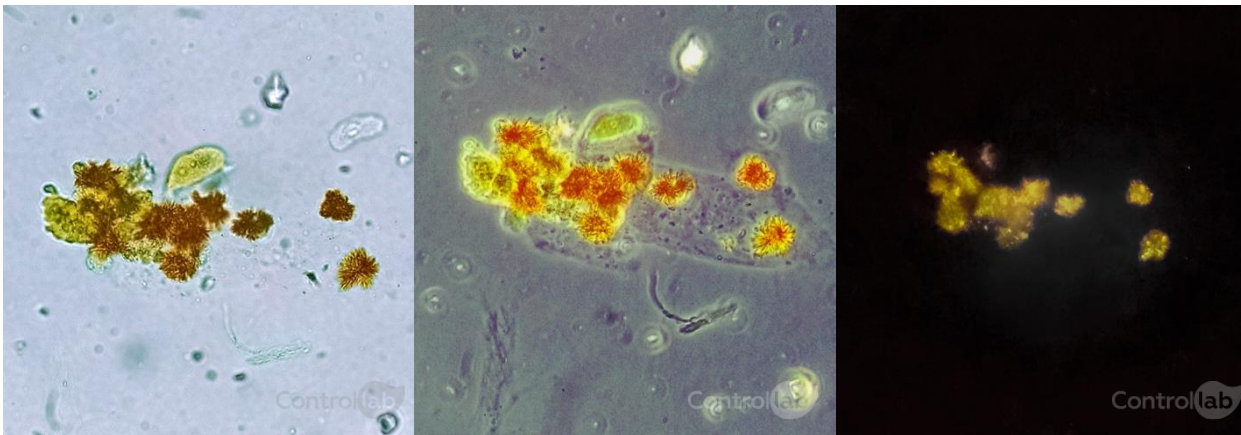


- ➔ Tyrosine crystals.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

CRYSTALS



- Leucine crystal.
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

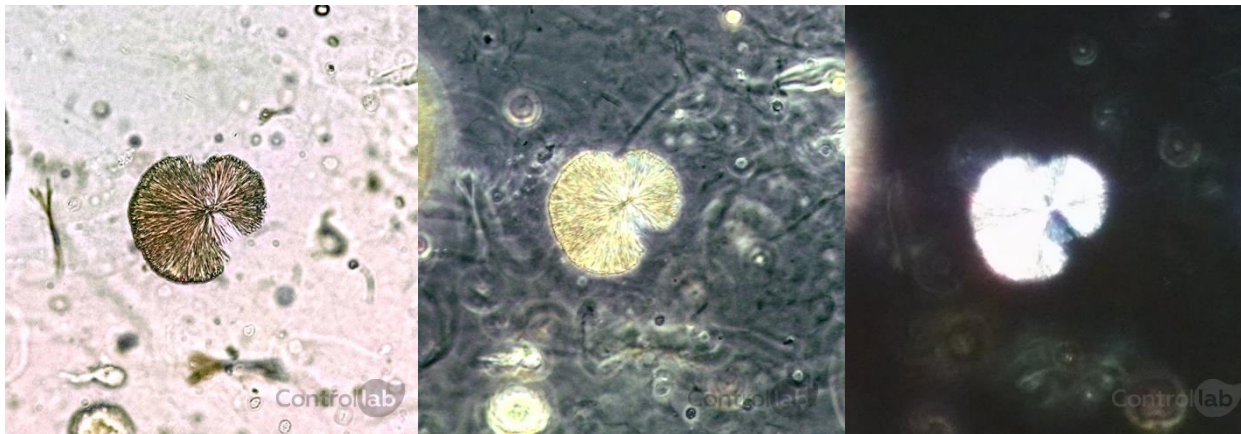


- Bilirubin crystals (in the photos adhered to the matrix of a cylinder).
- Original 400x magnification.
- Brightfield microscopy (left).
- Phase contrast microscopy (center).
- Polarized light microscopy (right).

CRYSTALS



- ➔ Cholesterol crystals.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

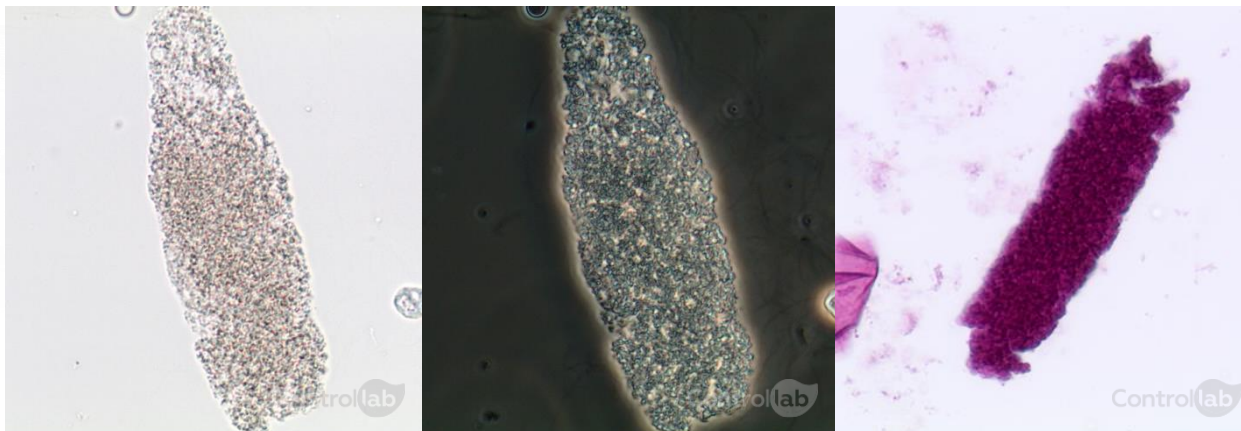


- ➔ Sulfadiazine crystals.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Polarized light microscopy (right).

CYLINDERS

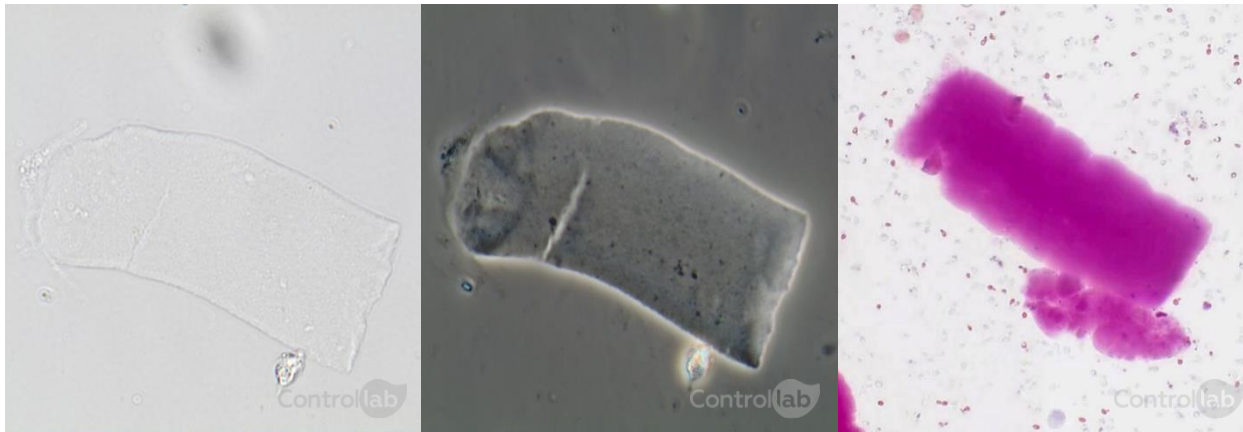


- ➔ Hyaline cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).



- ➔ Granular cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CYLINDERS

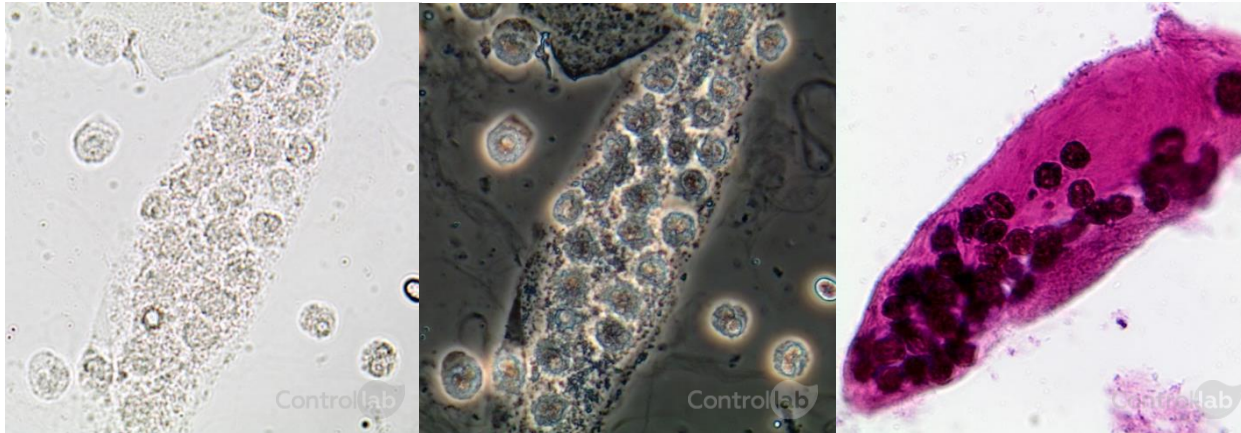


- ➔ Waxy cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

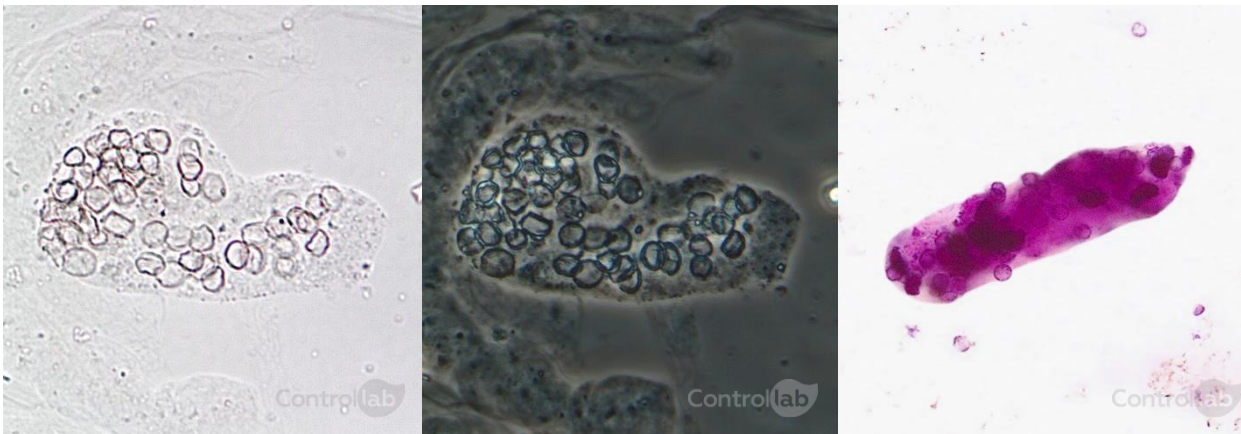


- ➔ Epithelial cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CYLINDERS

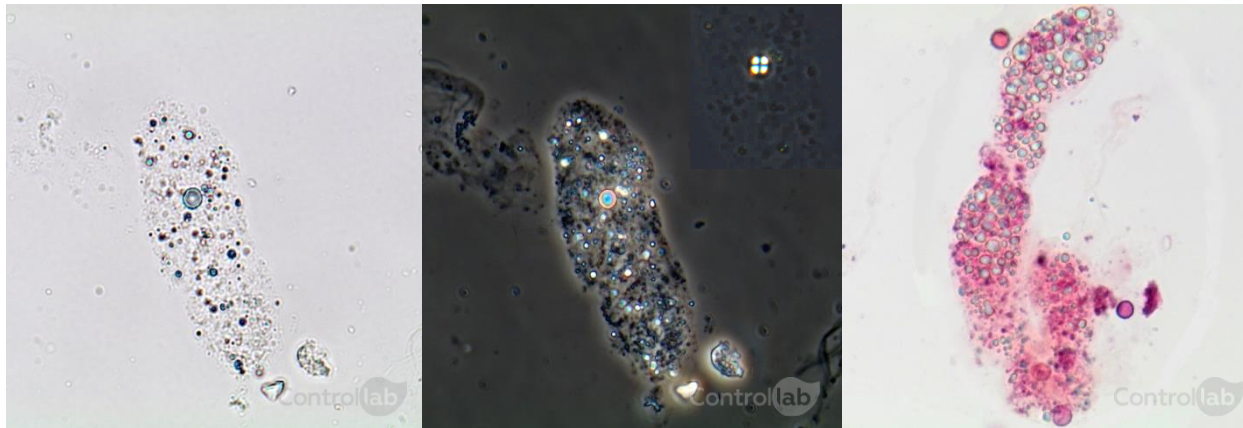


- ➔ Leukocyte cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

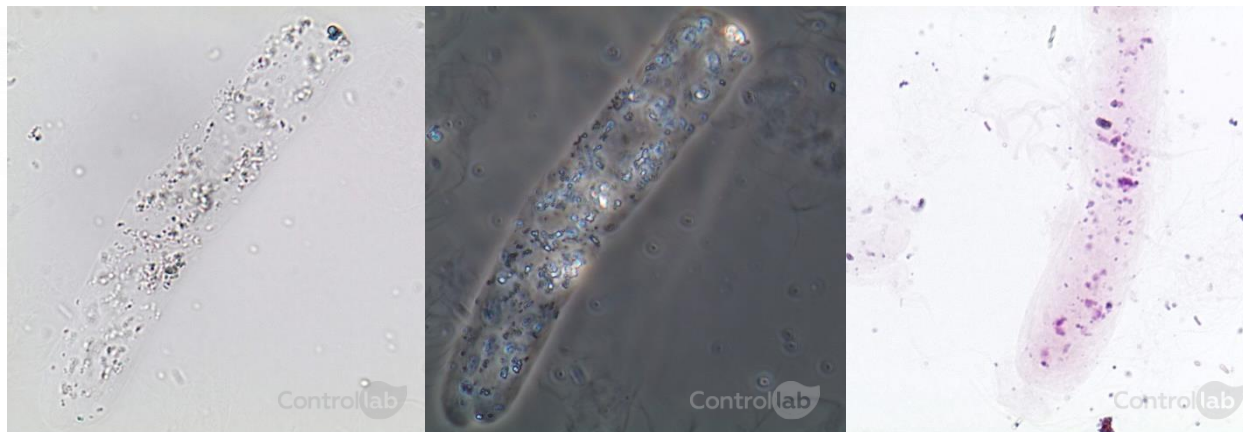


- ➔ Erythrocyte cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

CYLINDERS

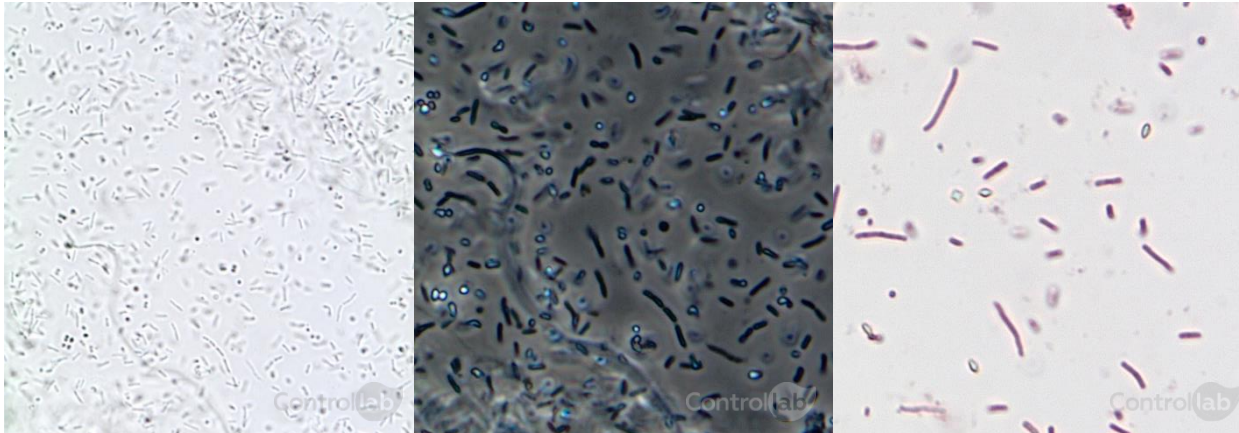


- ➔ Grease cylinder.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center) and Polarized light microscopy (upper right corner of center image).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

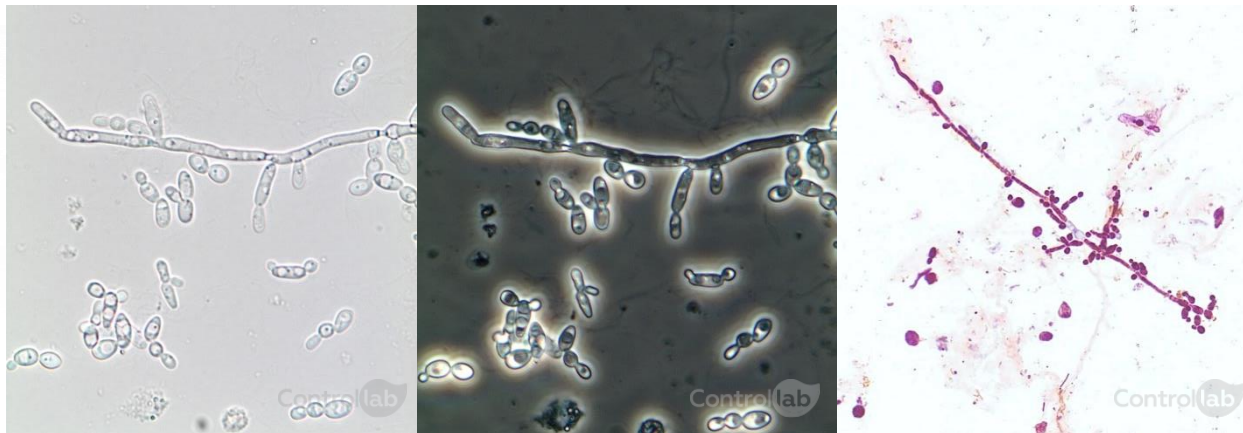


- ➔ Mixed cast (hyaline-granular).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

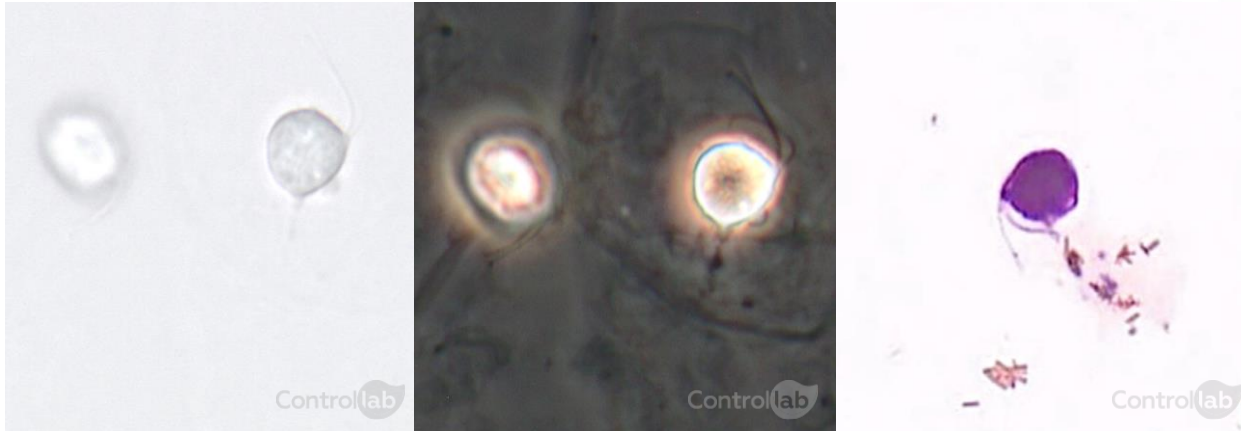
MICROORGANISMS



- ➔ Bacteria.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).



- ➔ Yeasts (blastospores and pseudohypha).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

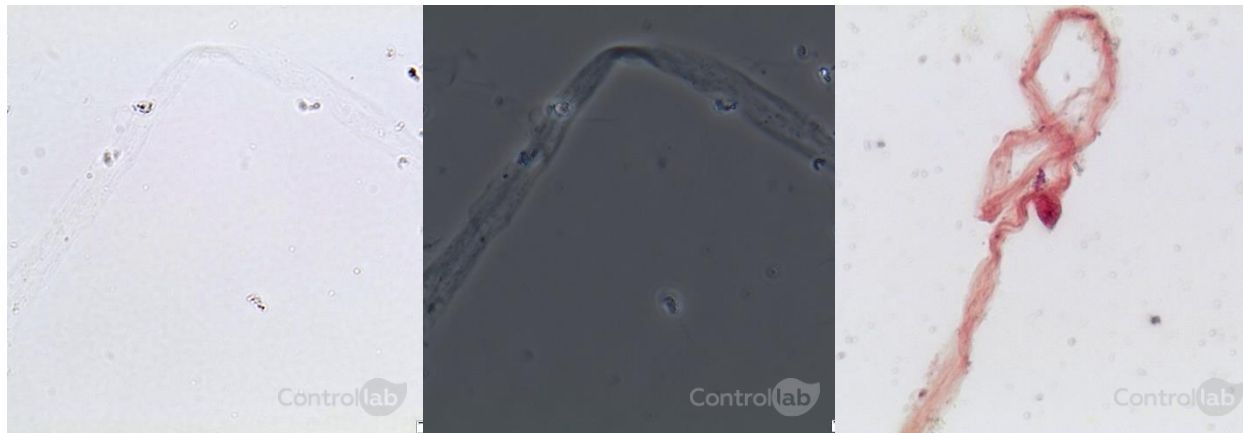


- ➔ *Trichomonas vaginalis*.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

OTHER ELEMENTS

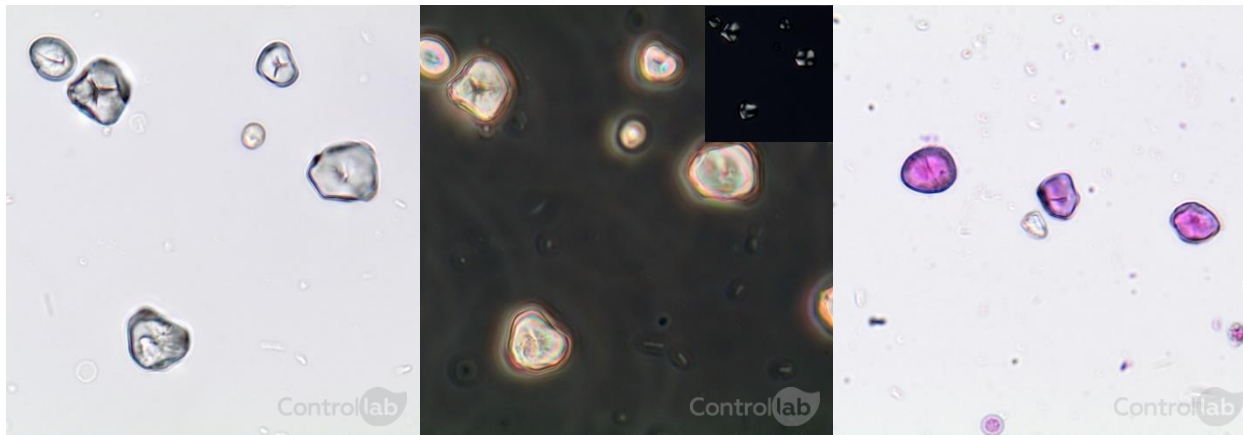


- ➔ Spermatozoa
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

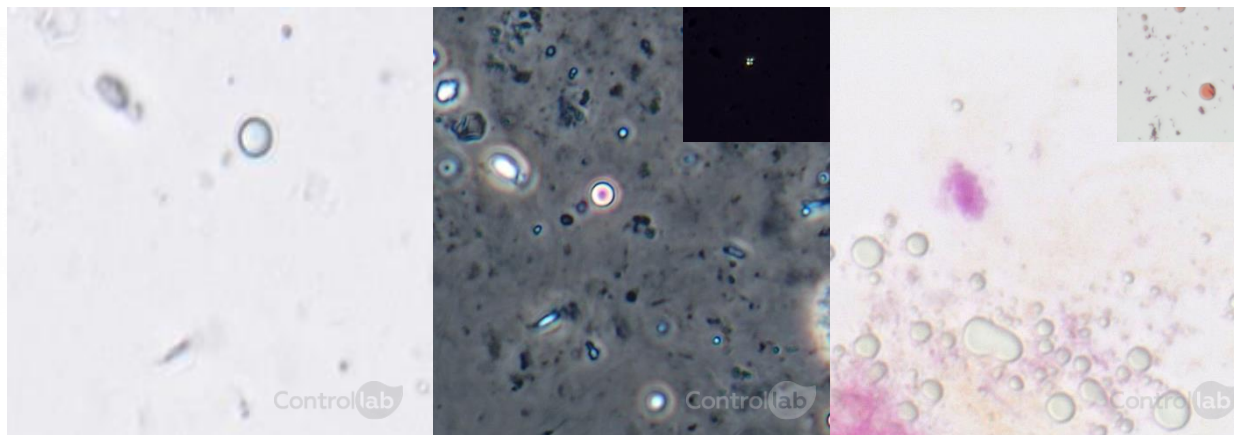


- ➔ Mucus thread.
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).

OTHER ELEMENTS



- ➔ Starch particles (artifact).
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center) and Polarized light microscopy (upper right corner of center image).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining (right).



- ➔ Lipid droplet
- ➔ Original 400x magnification.
- ➔ Brightfield microscopy (left).
- ➔ Phase contrast microscopy (center) and Polarized light microscopy (upper right corner of center image).
- ➔ Brightfield microscopy with Sternheimer-Malbin staining and brightfield microscopy with Sudan staining (upper right corner of right image).

BIBLIOGRAPHIC REFERENCES

- Fogazzi GB, Verdesca S, Garigali G. Urinalysis: core curriculum 2008. Am J Kidney Dis 2008;51(6):1052-67.
- Fogazzi GB. The urinary sediment – an integrated view. 3.ed. San Francisco: Elsevier, 2010.
- Reilly R, Perazella MA. Nephrology in 30 days. 2.ed. Nova York: Lange, 2013.
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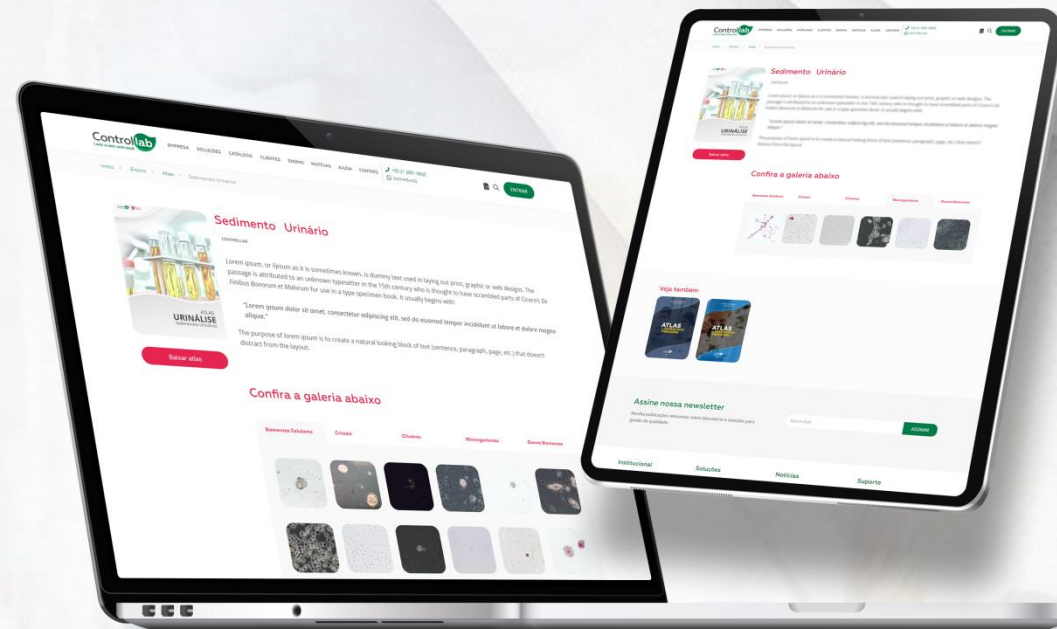
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Consult the digital version of the atlas for enlargement of the images



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