

Academic year 2024-2025

3rd. Year

Module: Microbiological techniques

Semester: 6

Session : 4 (Practical)

Lecture Title: General urine examination

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What is General Urine Examination?

- General Urine Examination (GUE) also called urine analysis (Urinalysis).
- A urinalysis is an array of tests performed on urine.
- It's used to detect and manage a wide range of disorders, such as **urinary tract infections**, **kidney disease** and **diabetes**.



URINE ANALYSIS

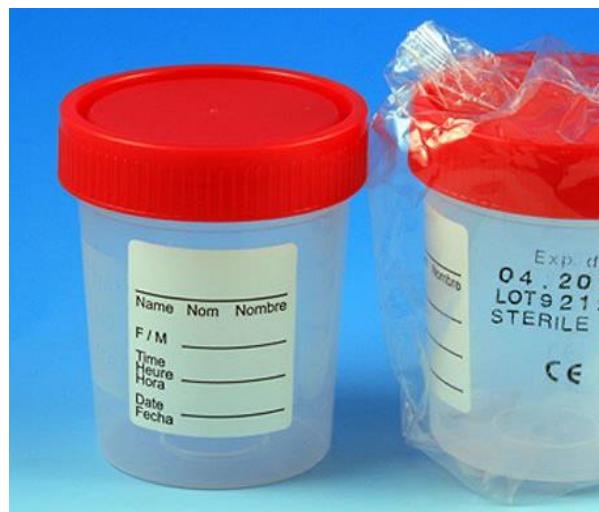


Collection of Urine Specimens

- The first voided morning urine (the most common)
- Random urine (for emergency)
- Clean-catch, midstream urine (for urine culture)

Attention:

Urine need to be examined within 1 hour, else requires refrigeration. **why?!**



Urine examination

- **Physical examination**
 - volume
 - color
 - Appearance
 - odor
 - Specific gravity
- **Chemical examination**
- **Microscopic examination**

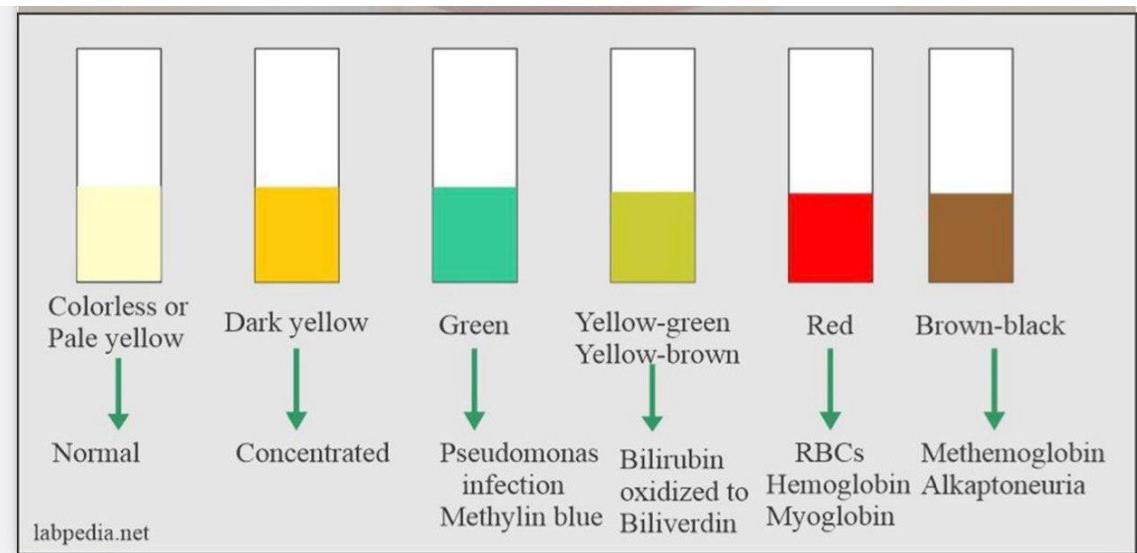


Urinary volume

- **Normal** = 600-2500ml passed in 24 hrs
- **Polyuria**
- **Oliguria**
- **Anuria**

Color

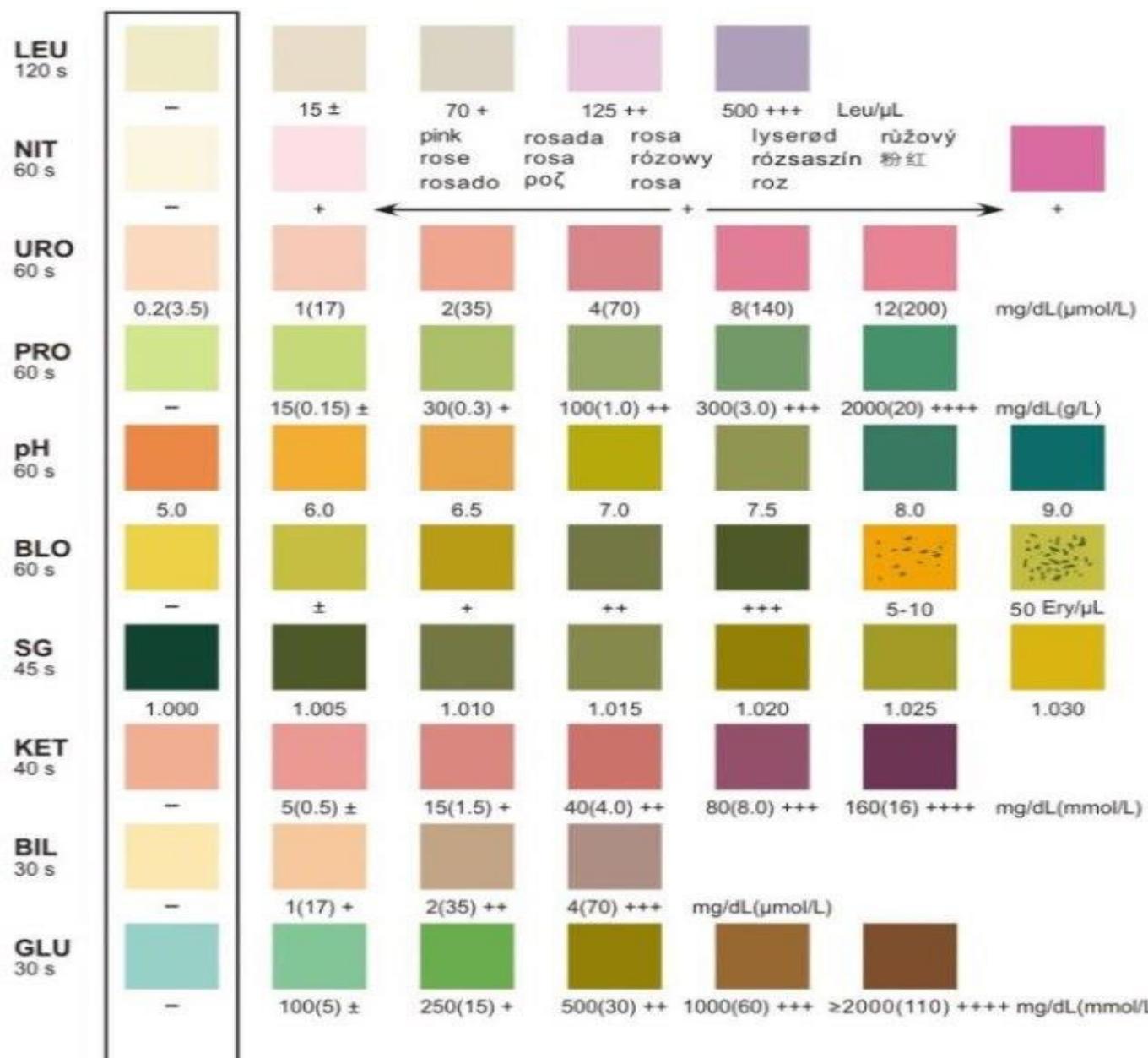
- **Normal**= clear, pale yellow/ straw colour (Urochrome)



Chemical examination

- pH
- Leukocyte esterase
- Protein
- Glucose
- Ketones
- Nitrate
- Bilirubin
- Urobilinogen



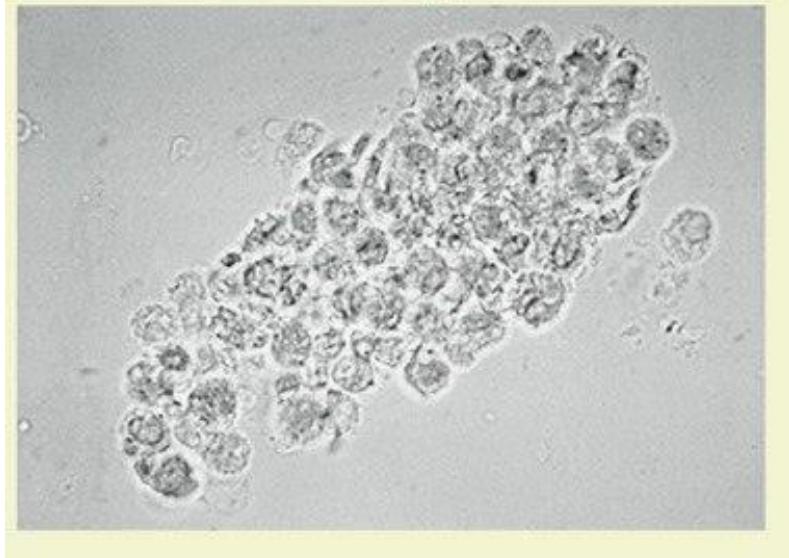
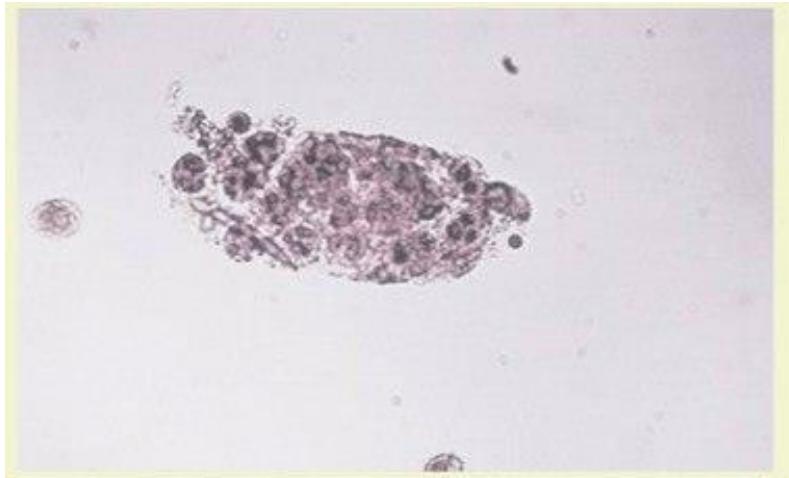


Microscopic urine exam

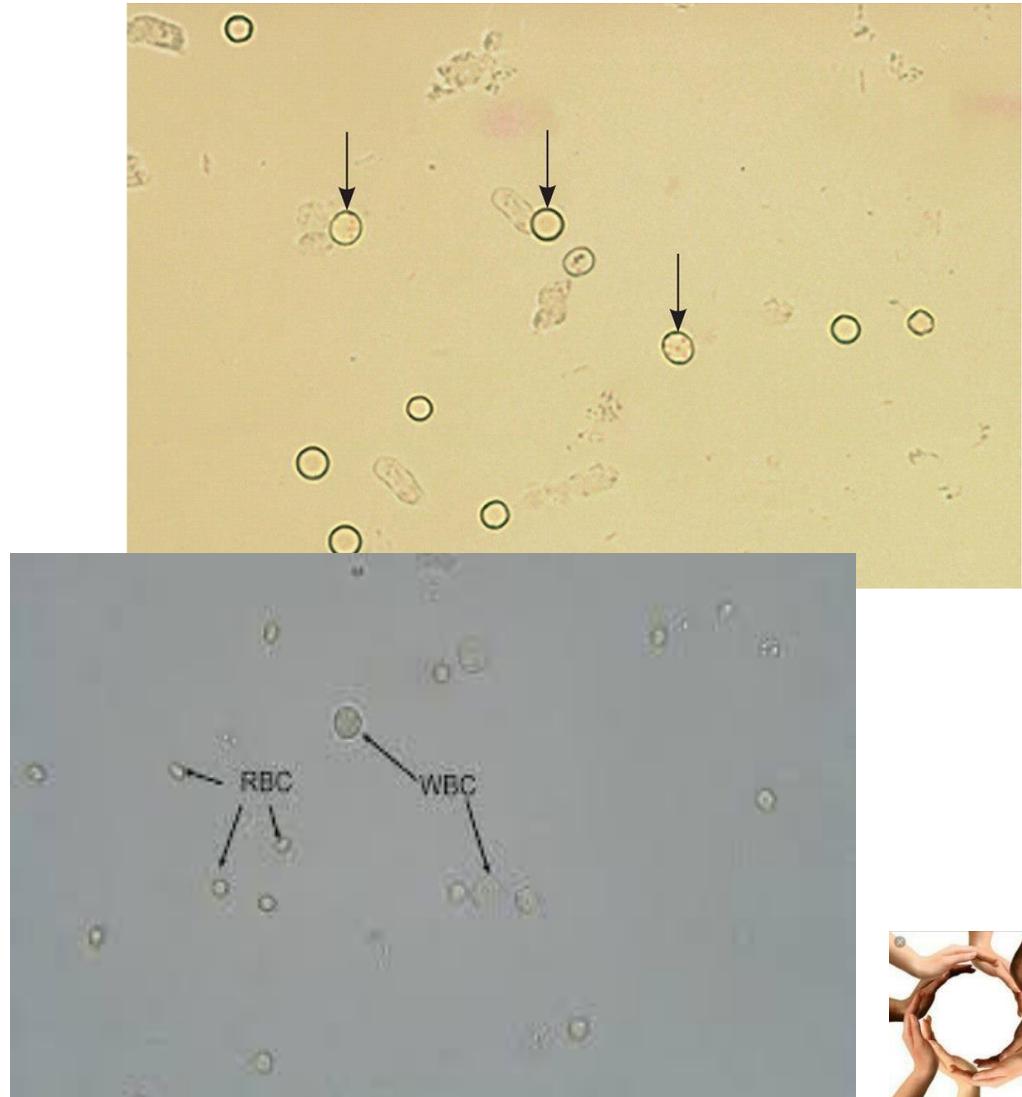
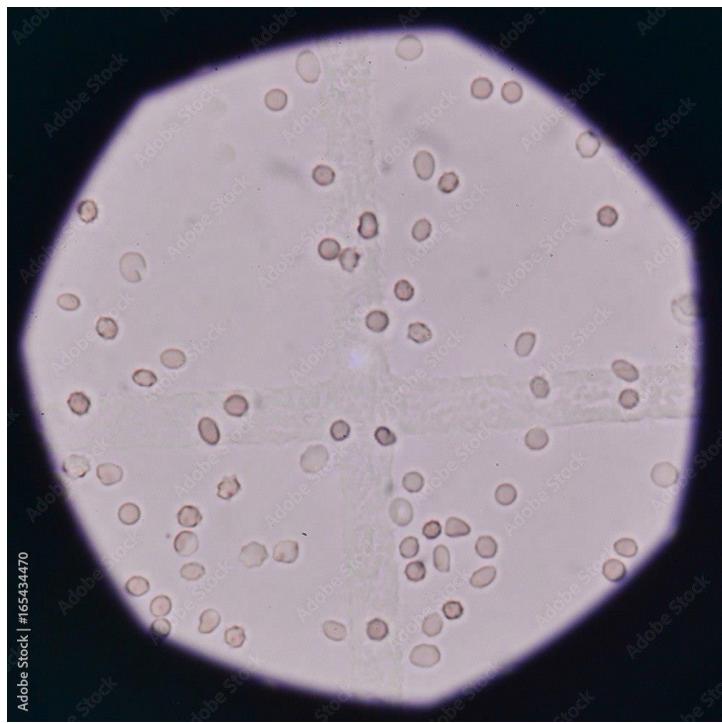
- Microscopic examination of sediment in the urine includes observation of:
 - Blood cells (red blood cells and white blood cells)
 - Epithelial cells
 - Bacteria
 - Casts
 - Crystals, amorphous crystals
 - Mucous
 - Yeast, parasites, and sperms.



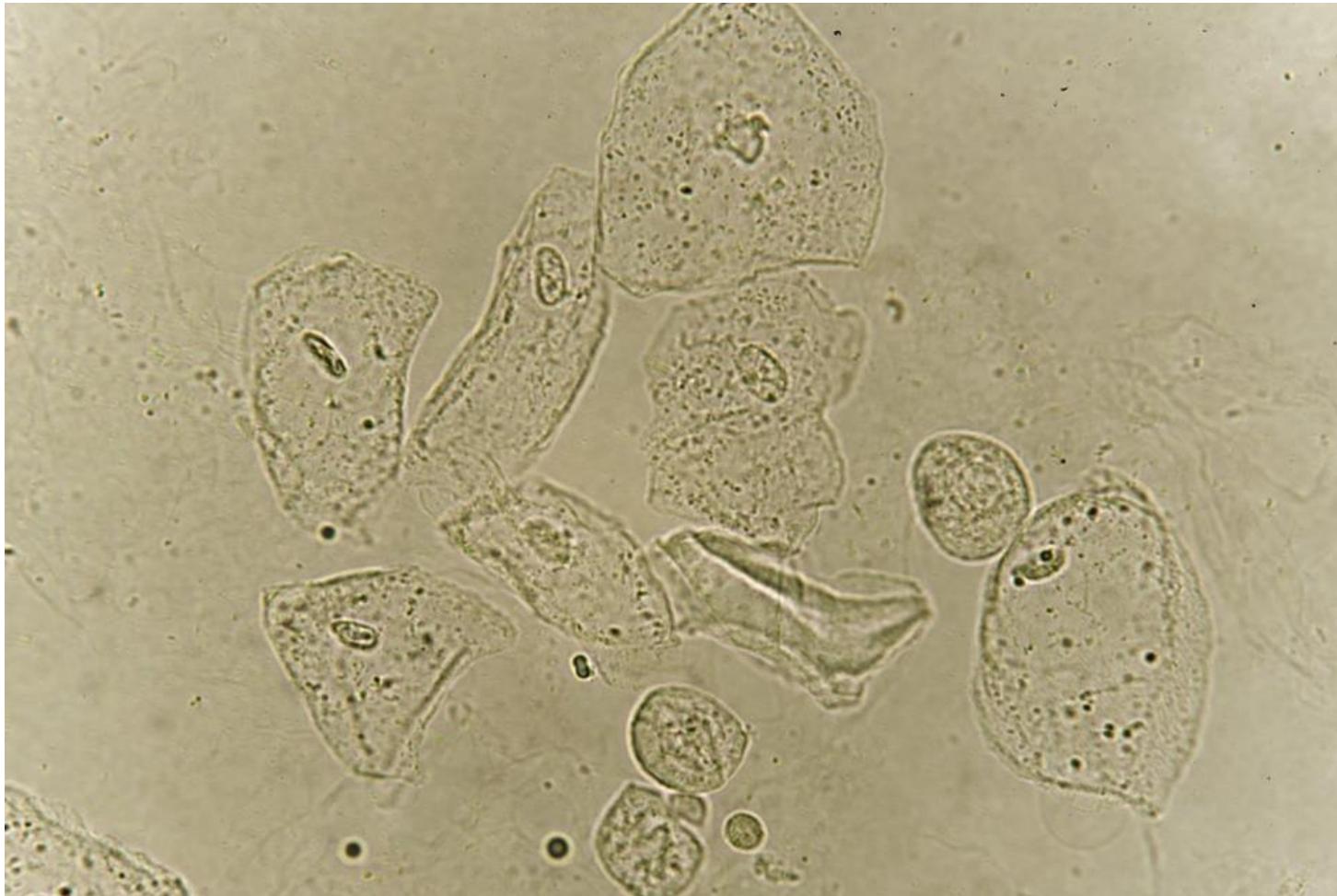
white blood cells or pus cells



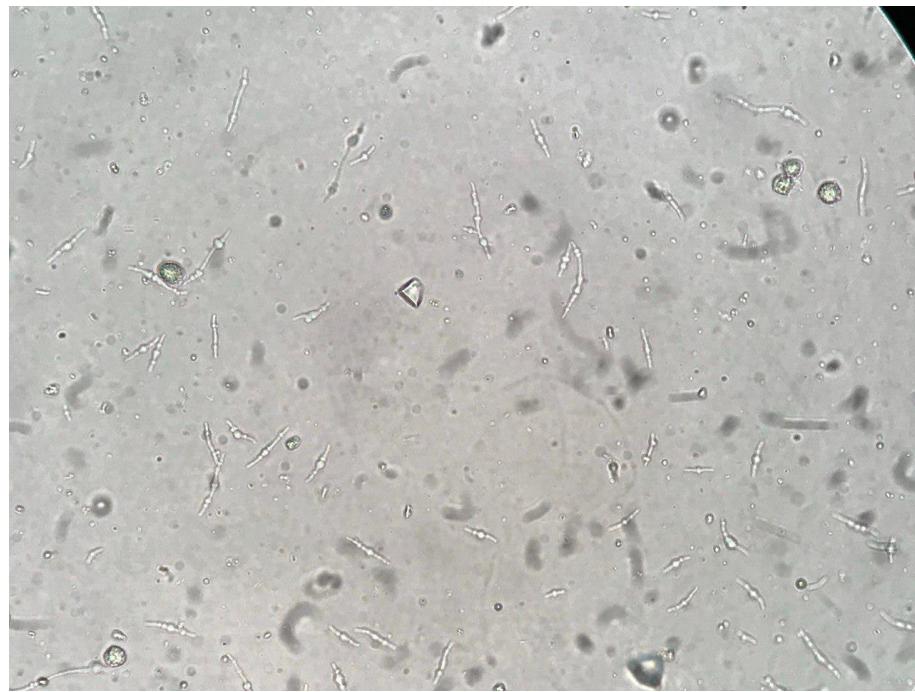
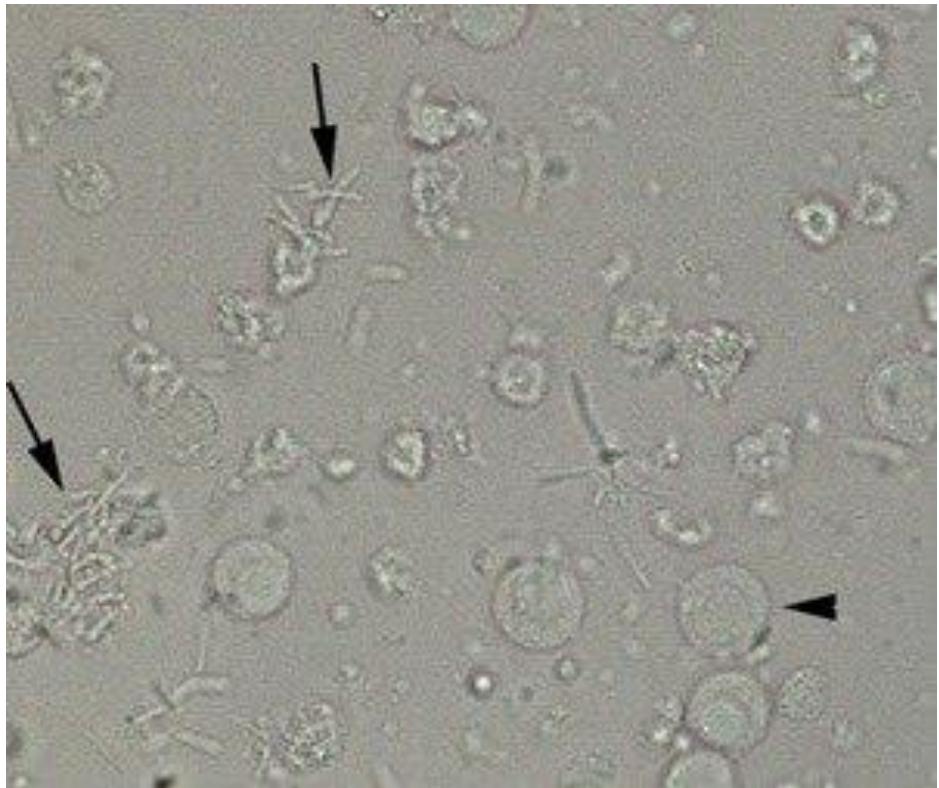
Red blood cells



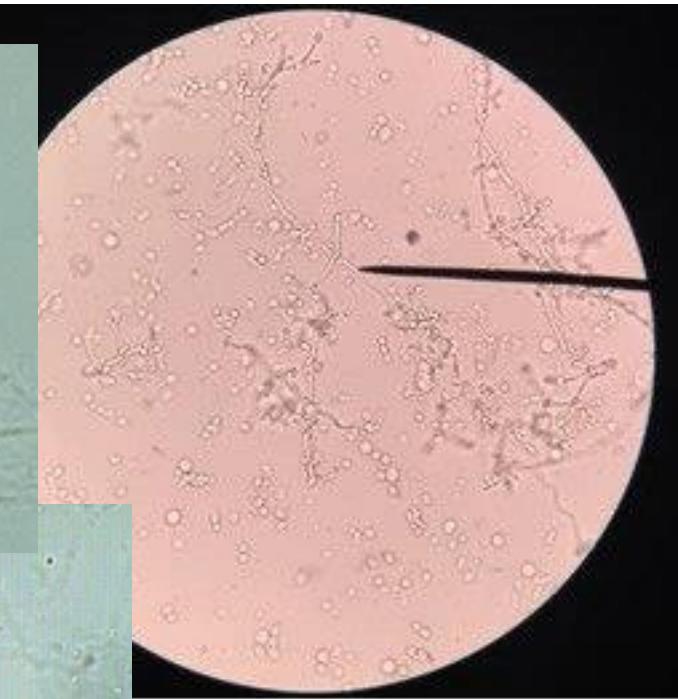
Epithelial cells



Bacteria



Mucous

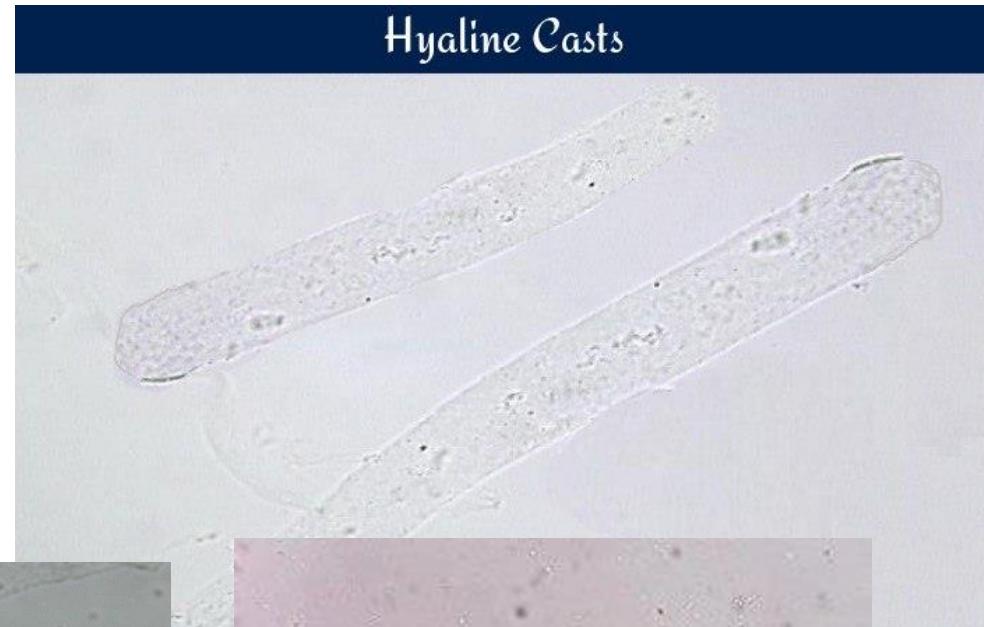


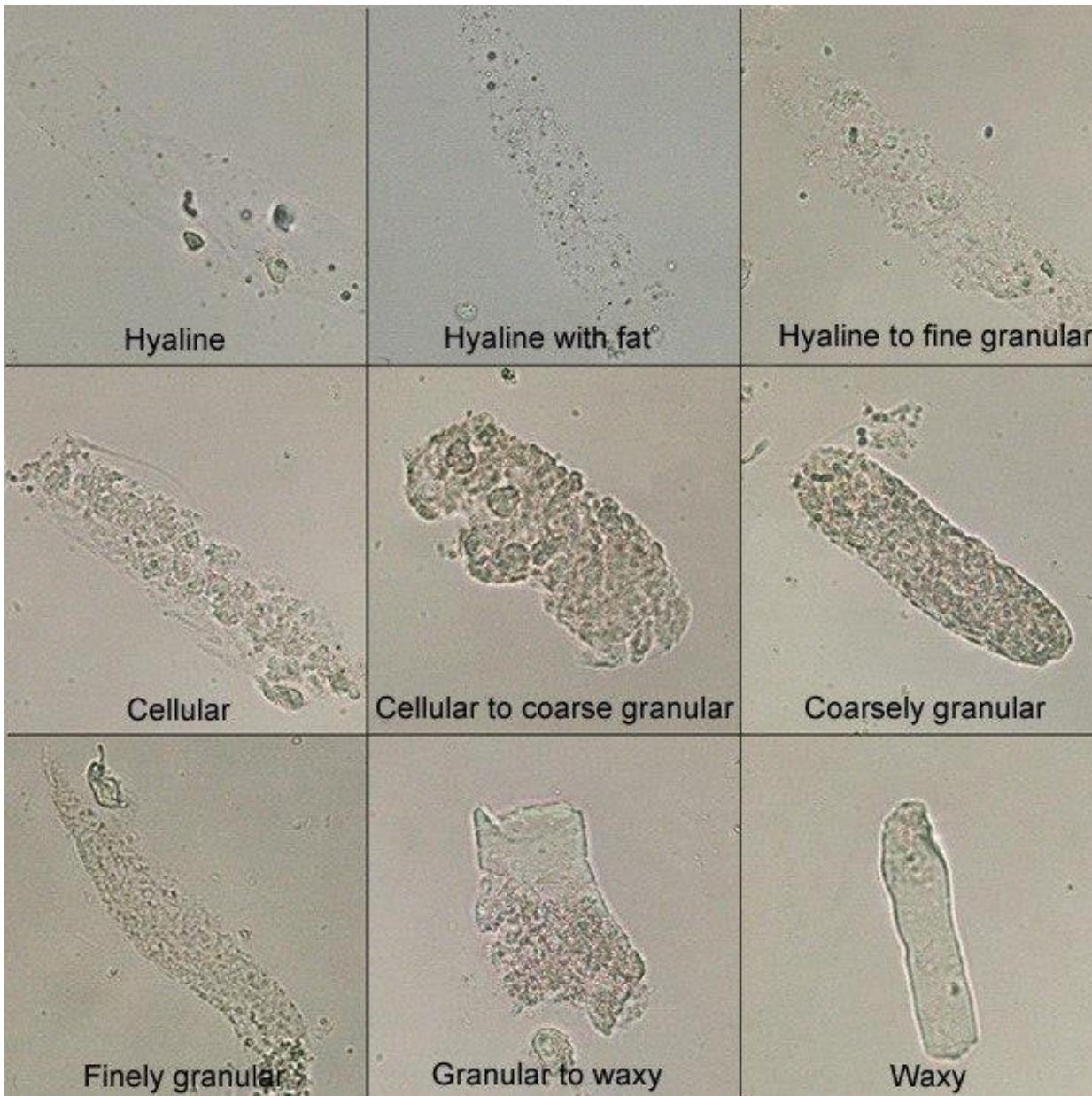
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Casts

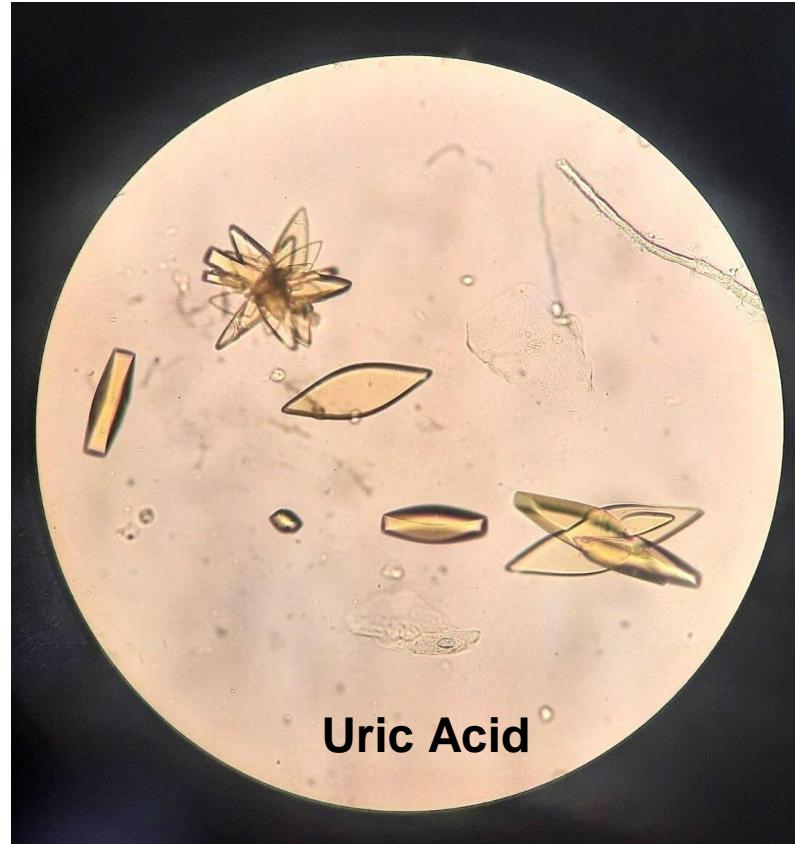
- **Hyaline casts**
- **Cellular casts**
- **Granular casts**
- **Waxy casts**

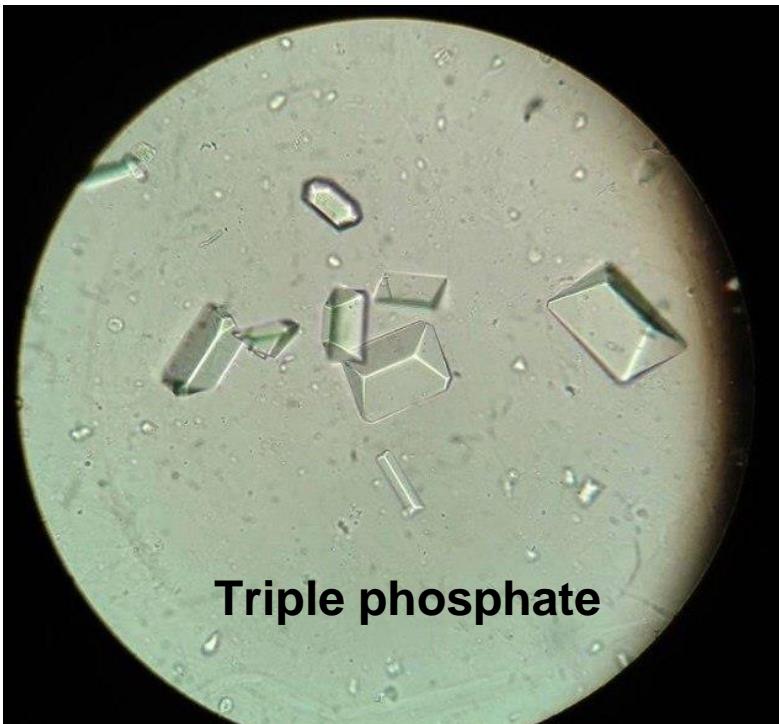
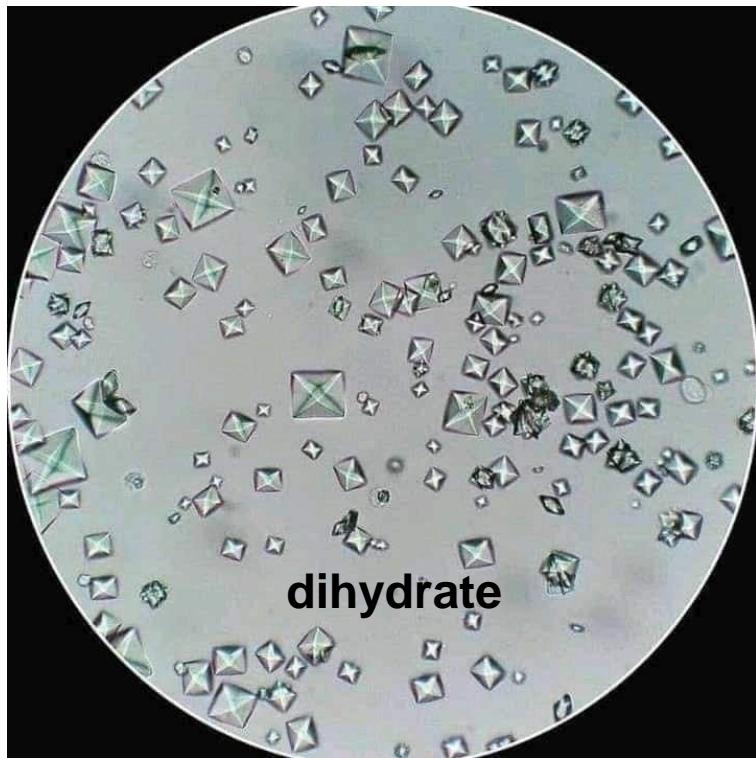
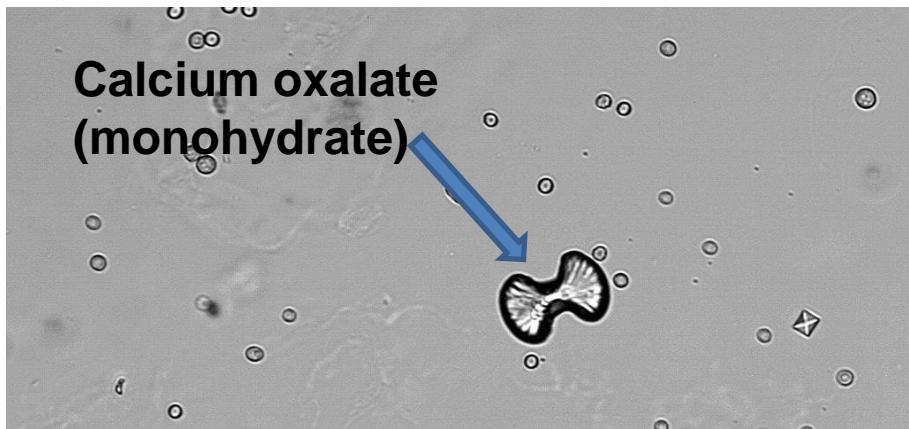




Crystals

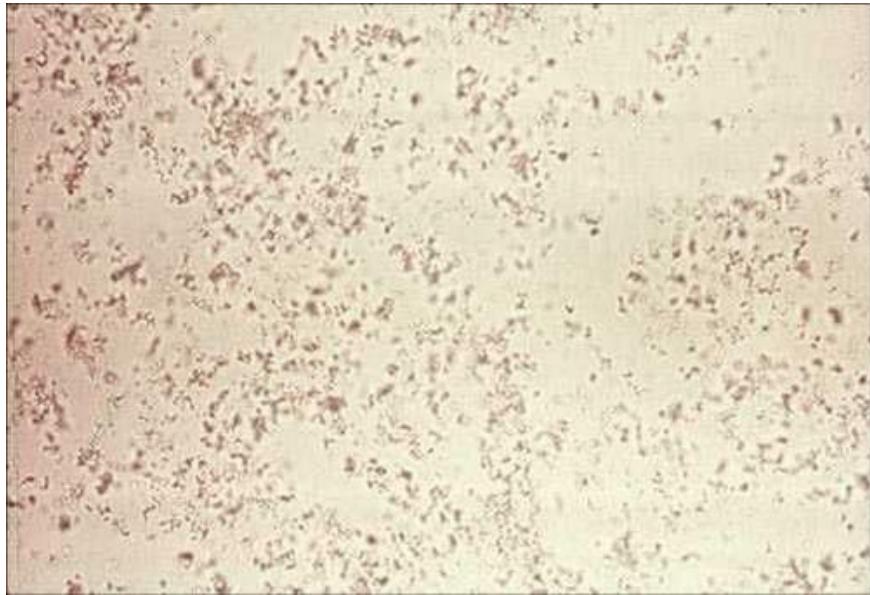
- Uric Acid
- Calcium oxalate (monohydrate)
- Calcium oxalate (dihydrate)
- Triple phosphate



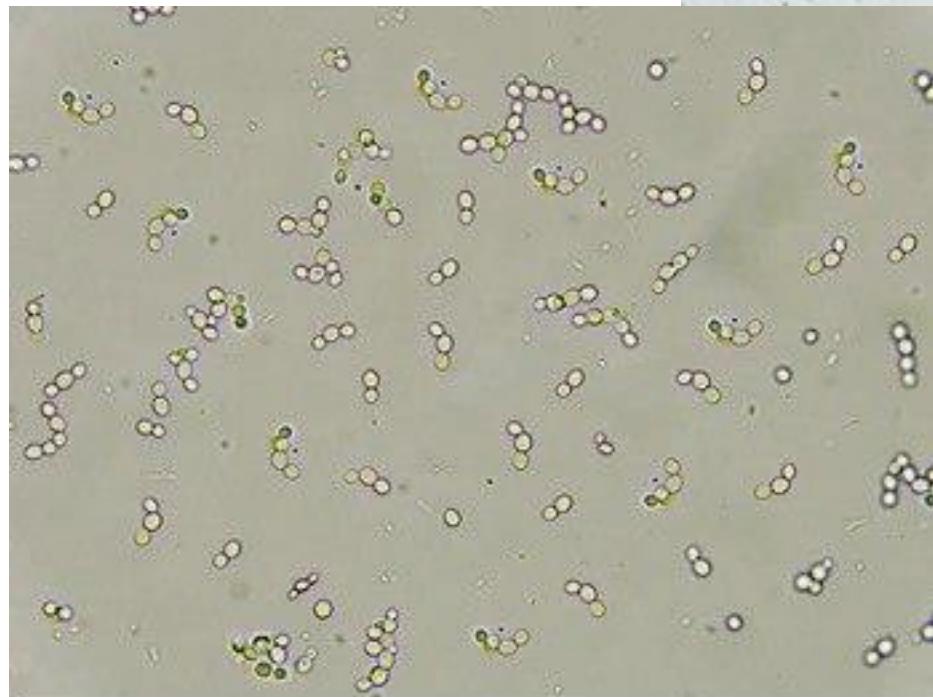


Amorphous crystals

- Amorphous urates
- Amorphous phosphates



Yeast

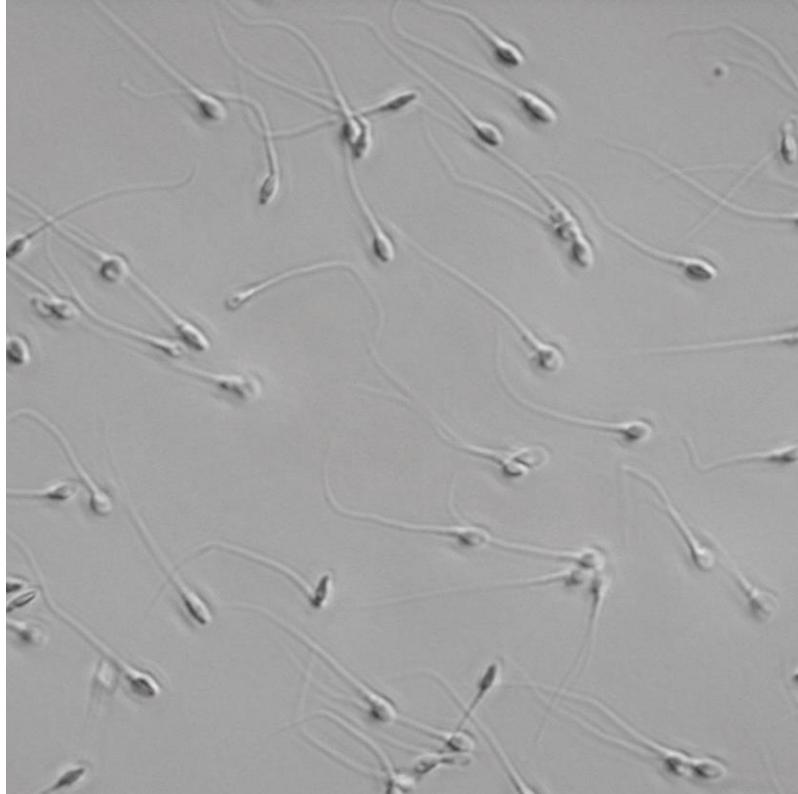


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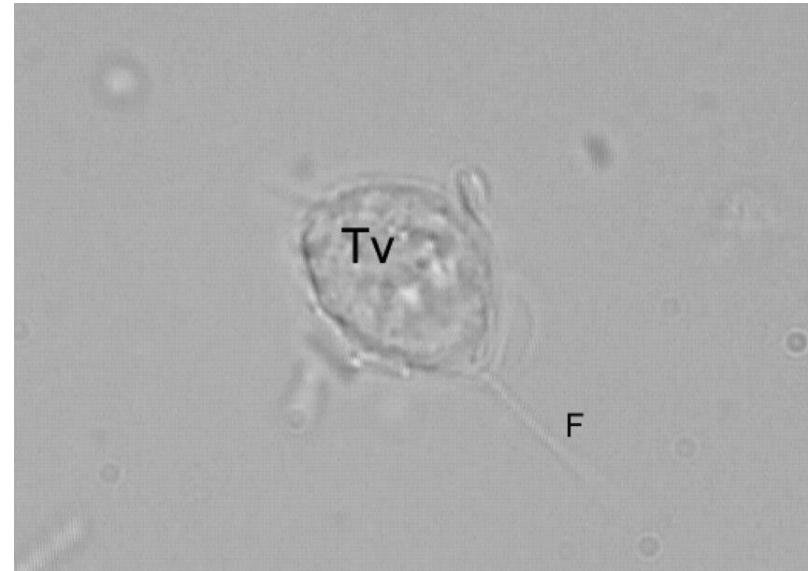
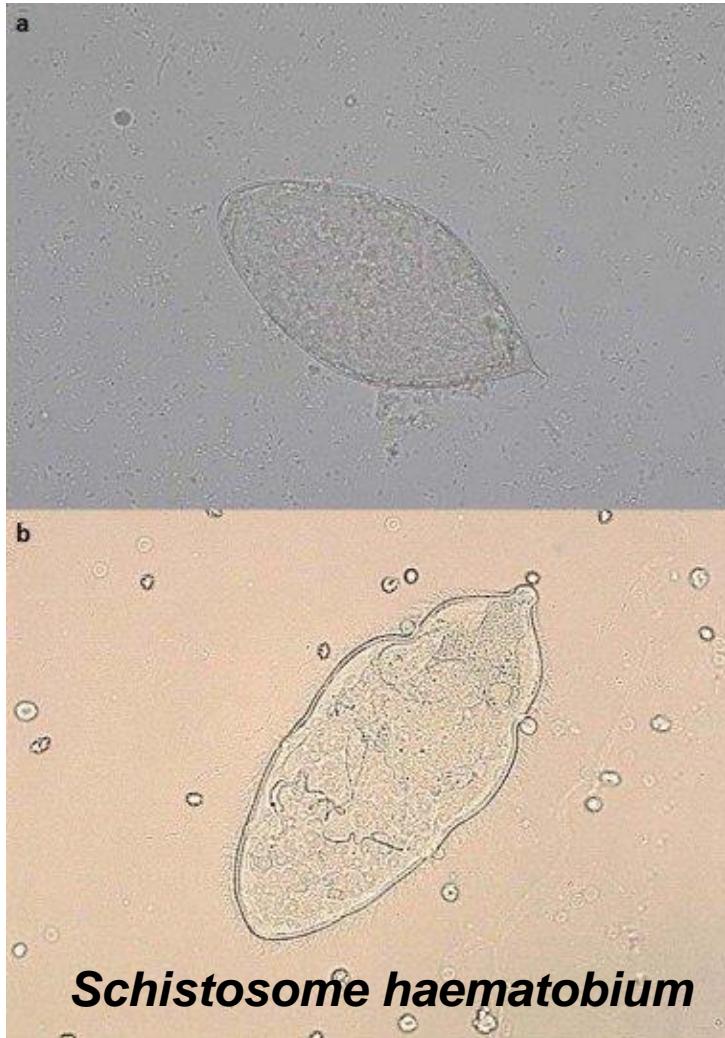




sperms



Parasites (urine ova)





References

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