

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.**

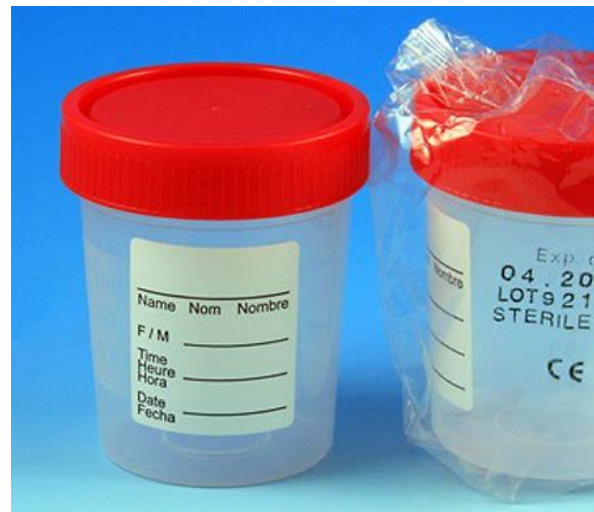


Collection of Urine Specimens

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

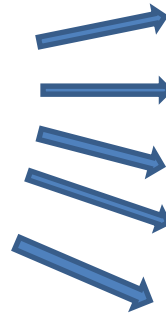
Attention:

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**

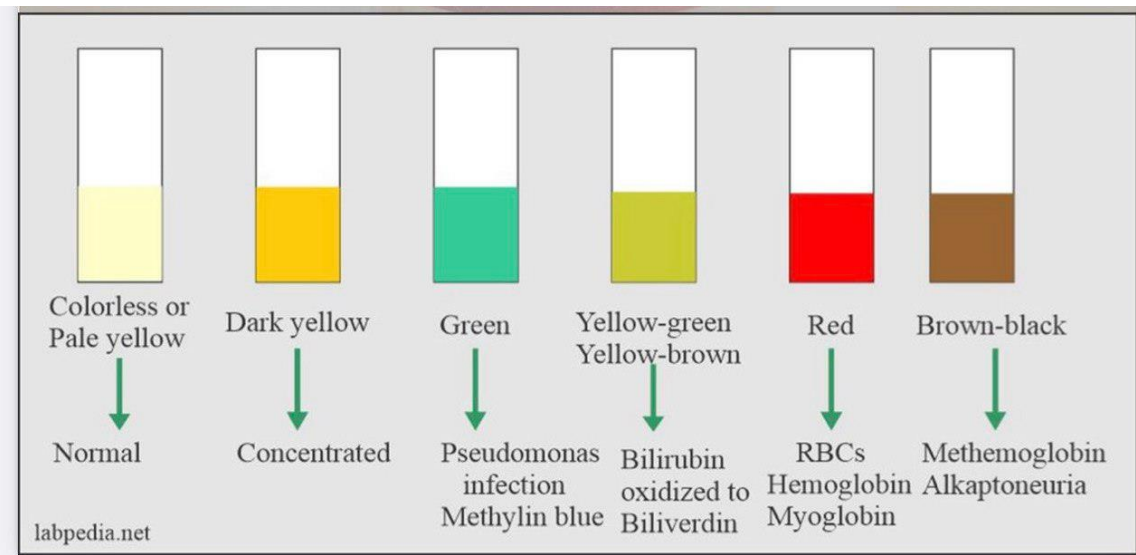


Urinary volume

- **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



LEU 120 s						Leu/μL	
	-	15 ±	70 +	125 ++	500 +++		
NIT 60 s							
	-	+				+	
URO 60 s							mg/dL(μmol/L)
	0.2(3.5)	1(17)	2(35)	4(70)	8(140)	12(200)	
PRO 60 s							mg/dL(g/L)
	-	15(0.15) ±	30(0.3) +	100(1.0) ++	300(3.0) +++	2000(20) ++++	
pH 60 s							
	5.0	6.0	6.5	7.0	7.5	8.0	9.0
BLO 60 s							
	-	±	+	++	+++	5-10	50 Ery/μL
SG 45 s							
	1.000	1.005	1.010	1.015	1.020	1.025	1.030
KET 40 s							mg/dL(mmol/L)
	-	5(0.5) ±	15(1.5) +	40(4.0) ++	80(8.0) +++	160(16) ++++	
BIL 30 s					mg/dL(μmol/L)		
	-	1(17) +	2(35) ++	4(70) +++			
GLU 30 s							mg/dL(mmol/L)
	-	100(5) ±	250(15) +	500(30) ++	1000(60) +++	≥2000(110) ++++	

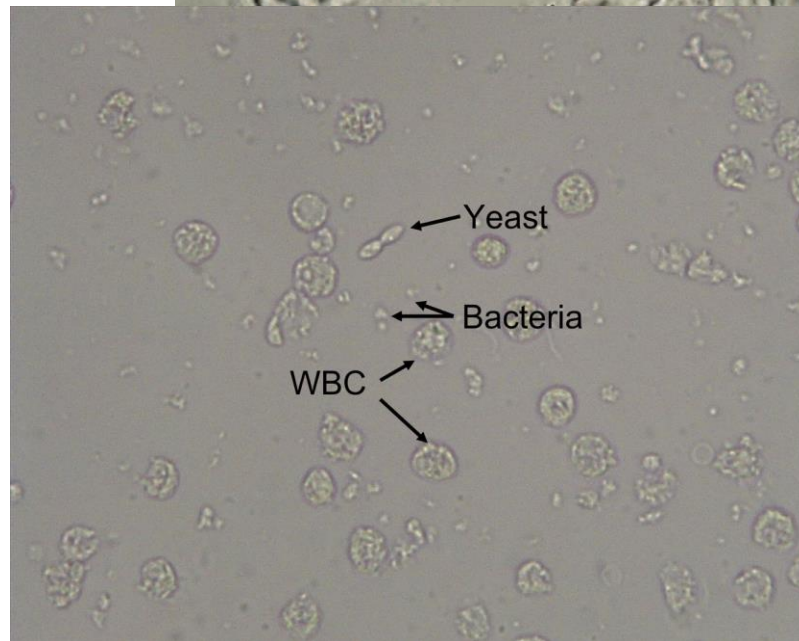
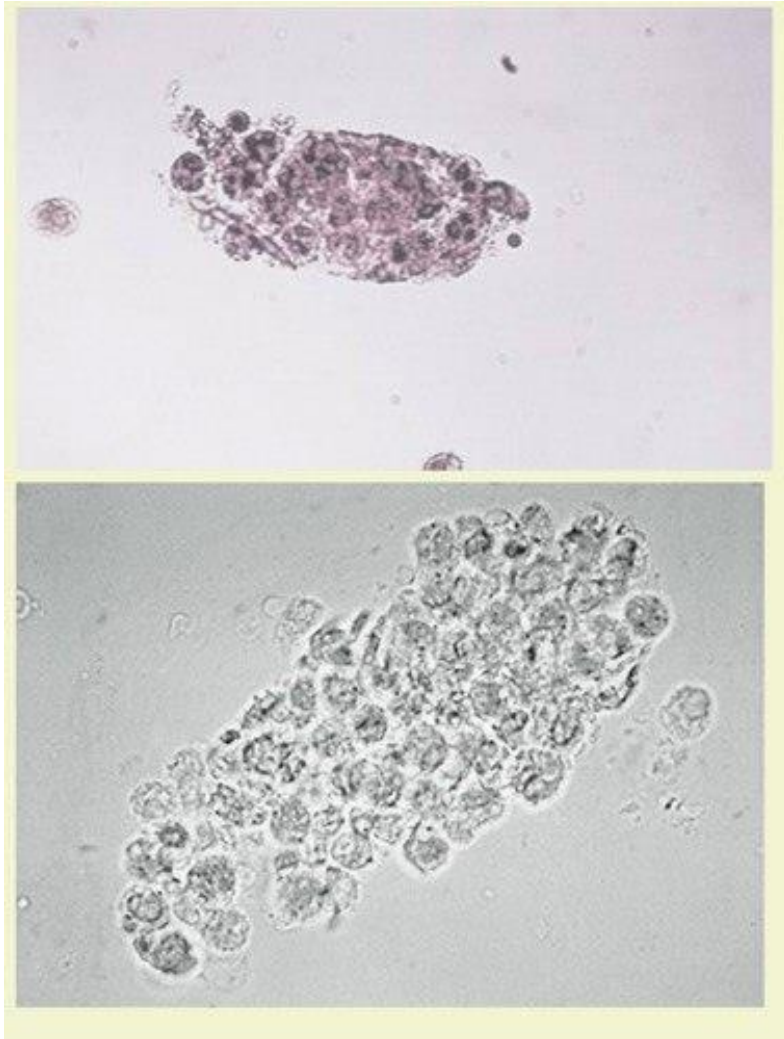


Microscopic urine exam

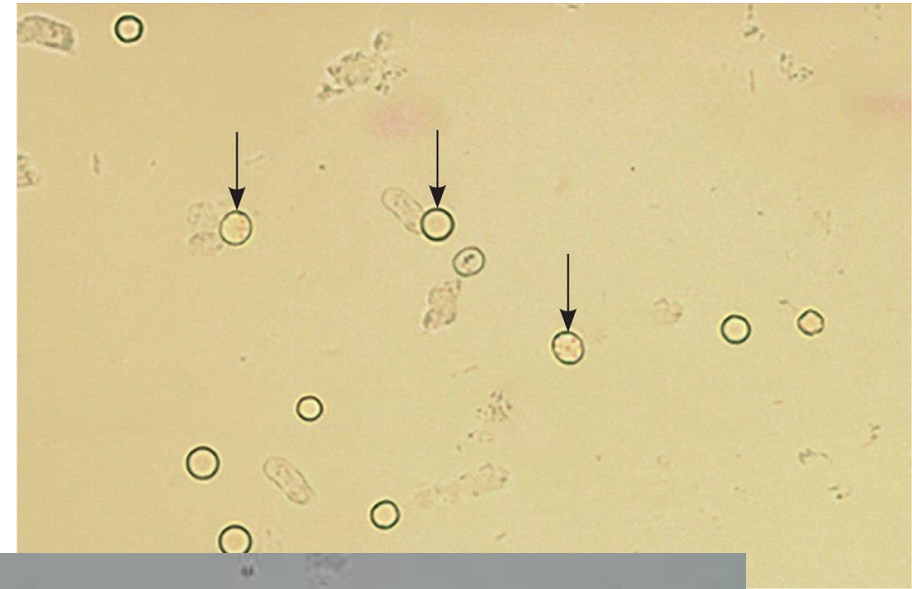
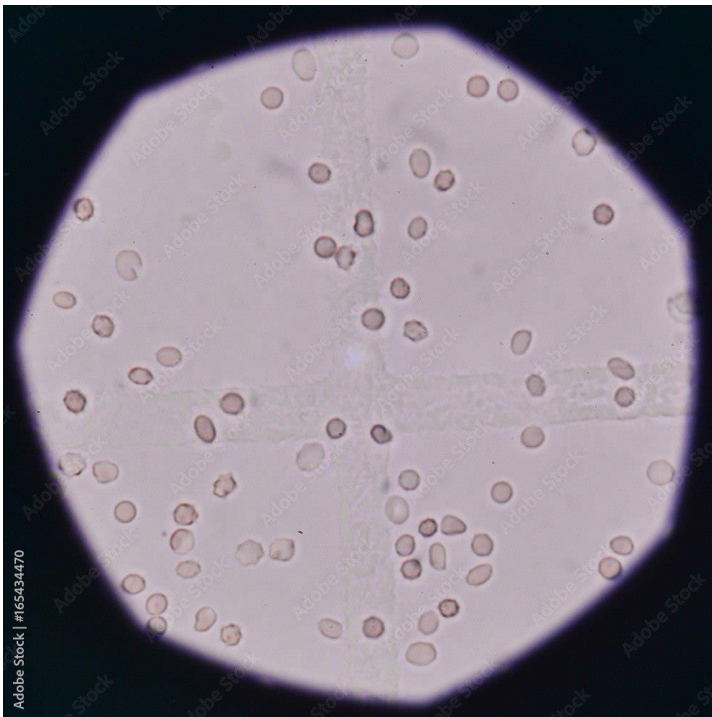
- Microscopic examination of sediment in the urine includes observation of:
- Blood cells (red blood cells and white blood cells)
- Epithelial cells
- Bacteria
- Casts
- Crystals, amorphous crystals
- Mucous
- Yeast, parasites, and sperms.



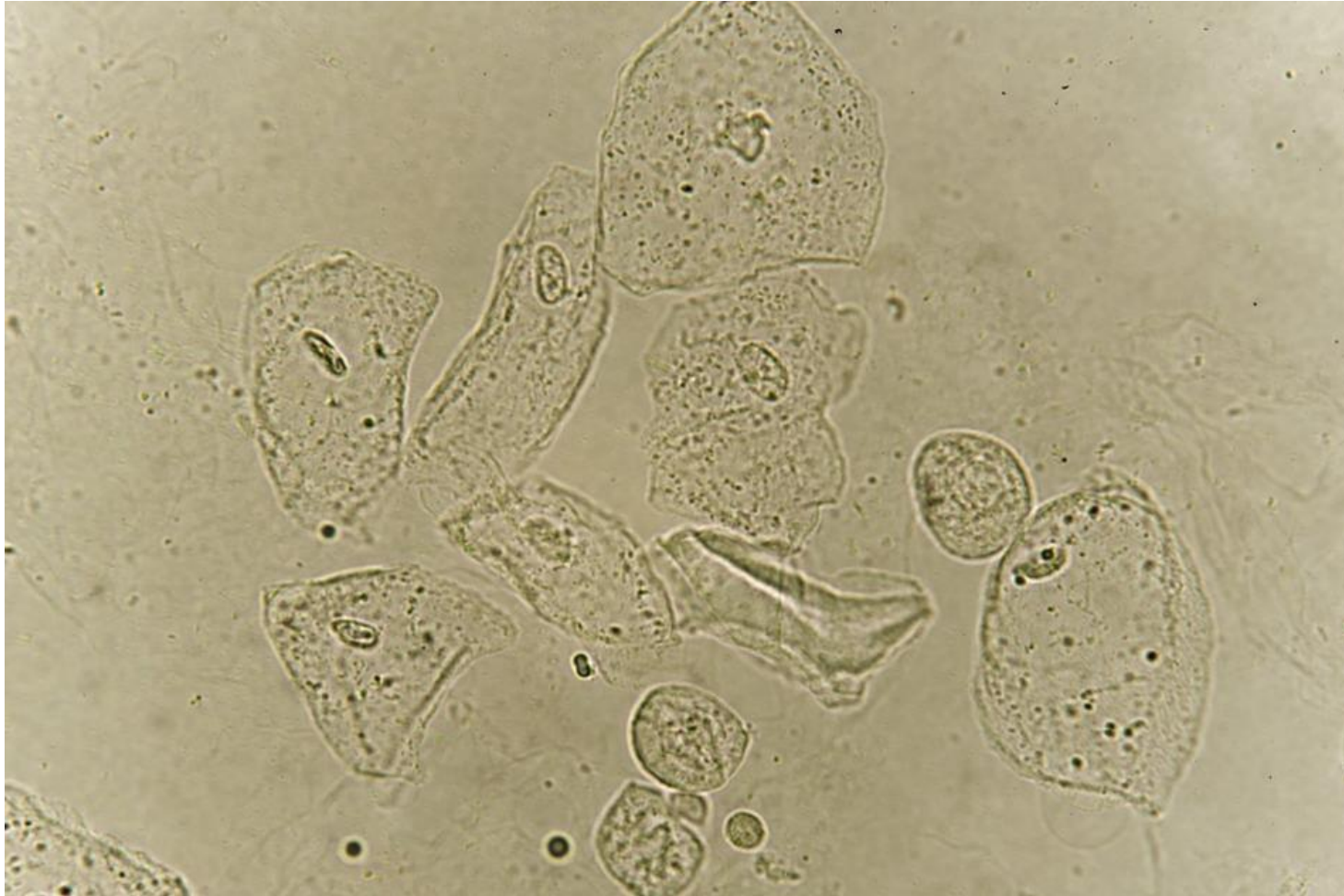
white blood cells or pus cells



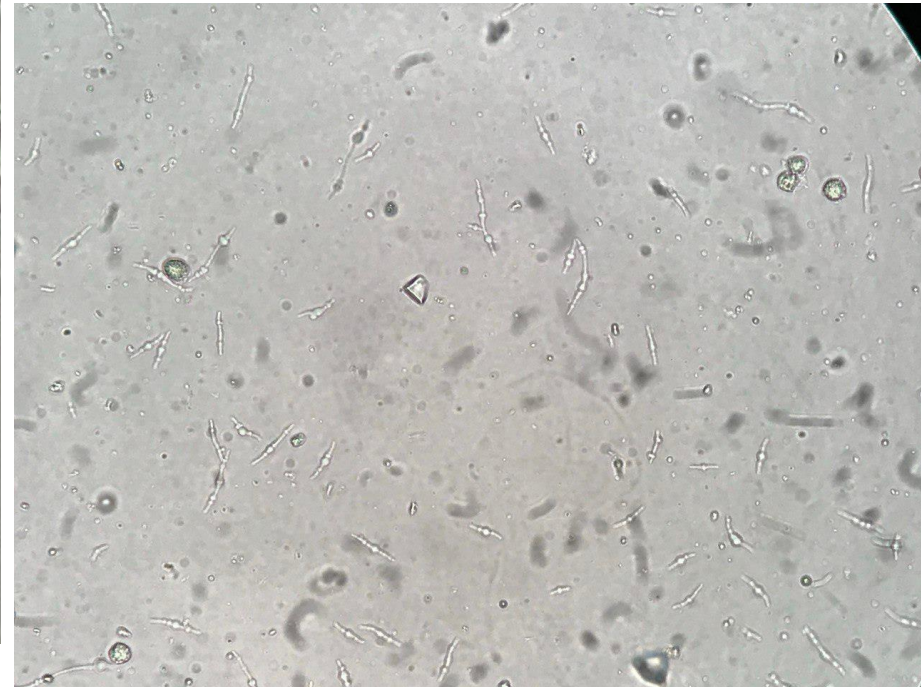
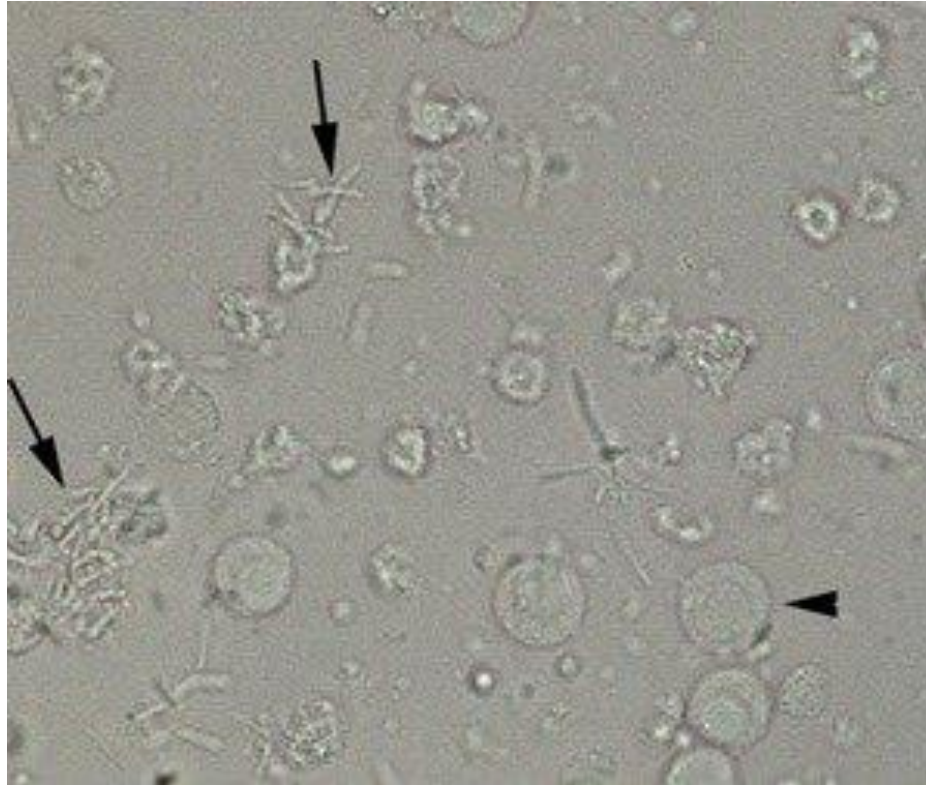
Red blood cells



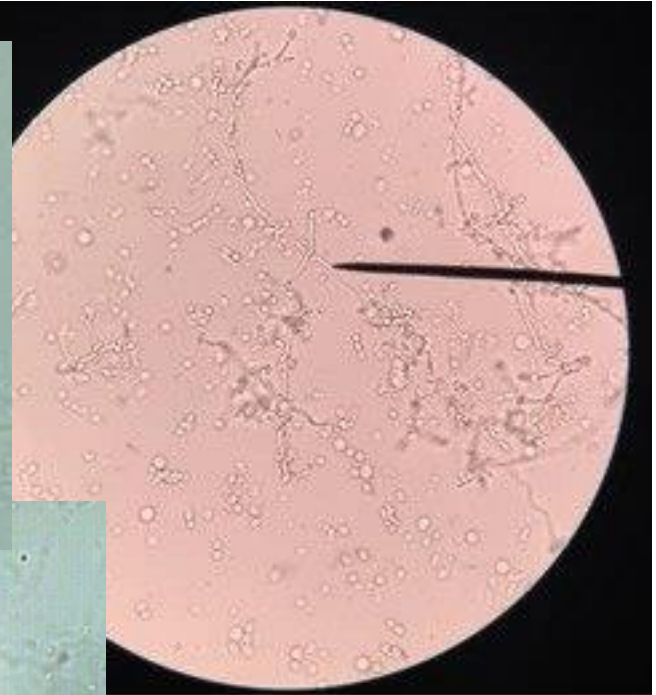
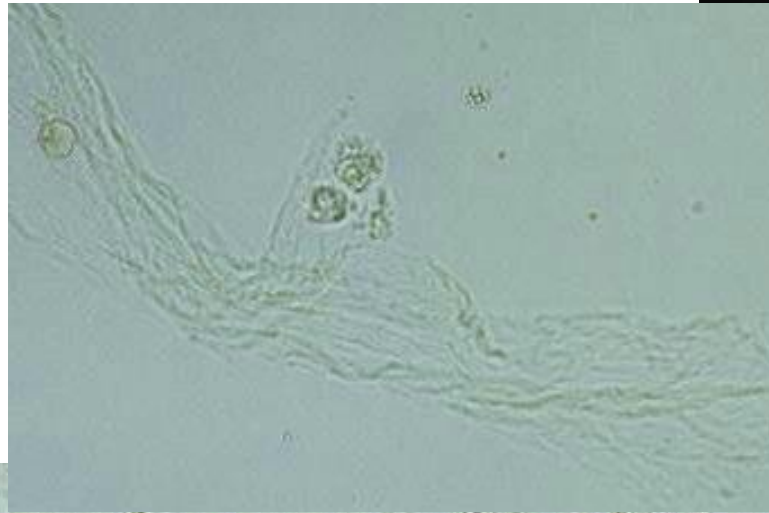
Epithelial cells



Bacteria



Mucous



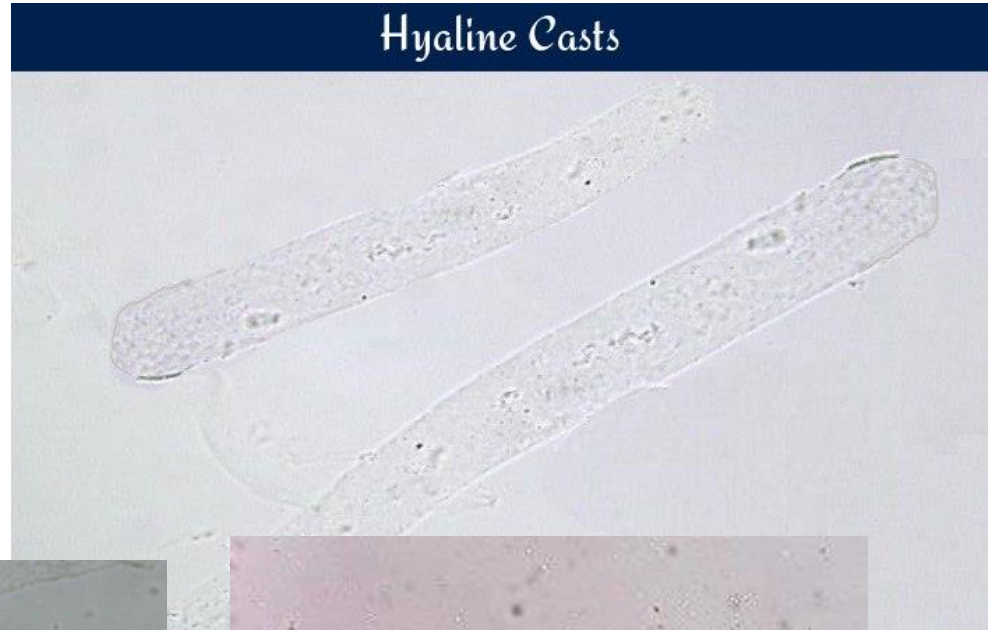
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Casts

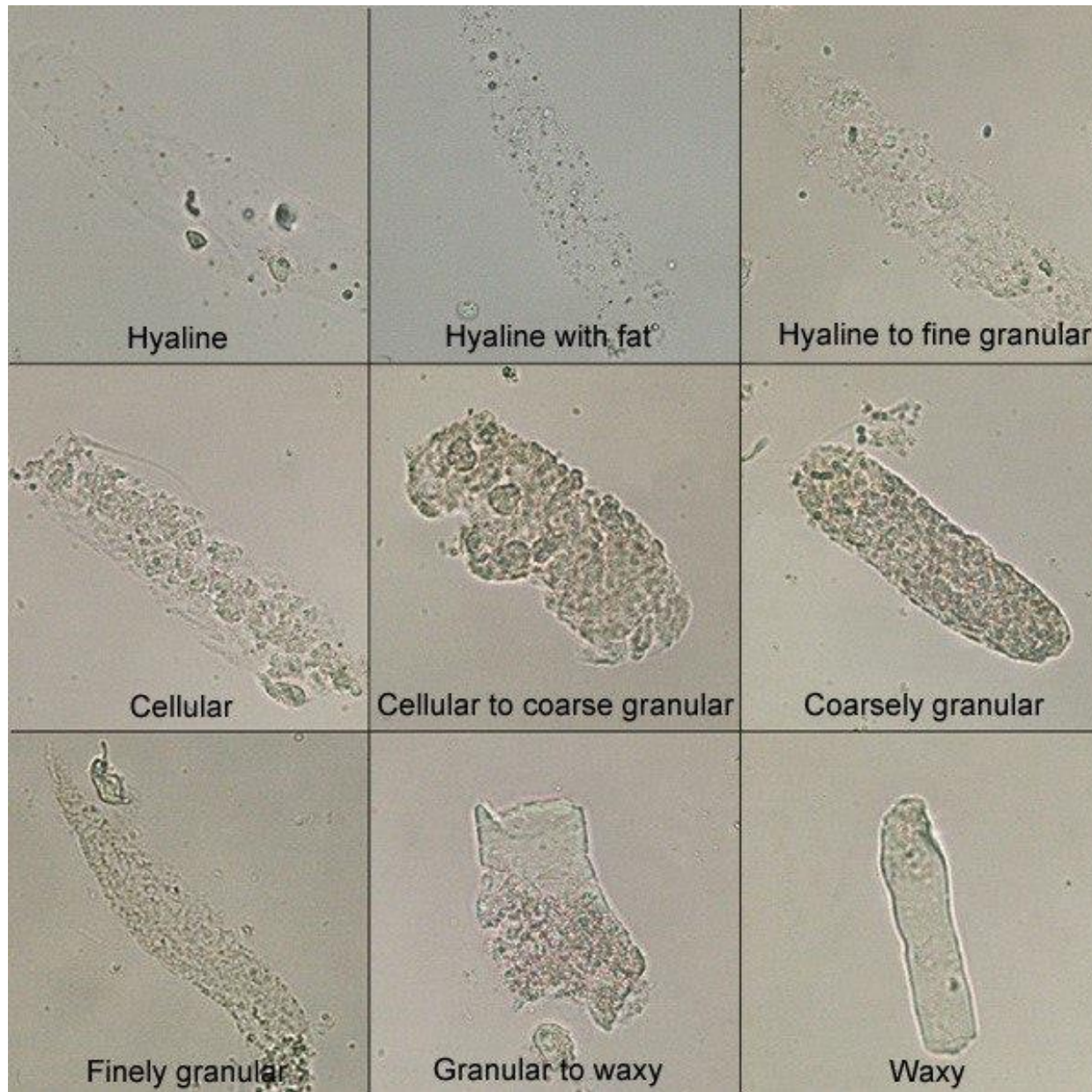
- Hyaline casts
- Cellular casts
- Granular casts
- Waxy casts

Hyaline Casts



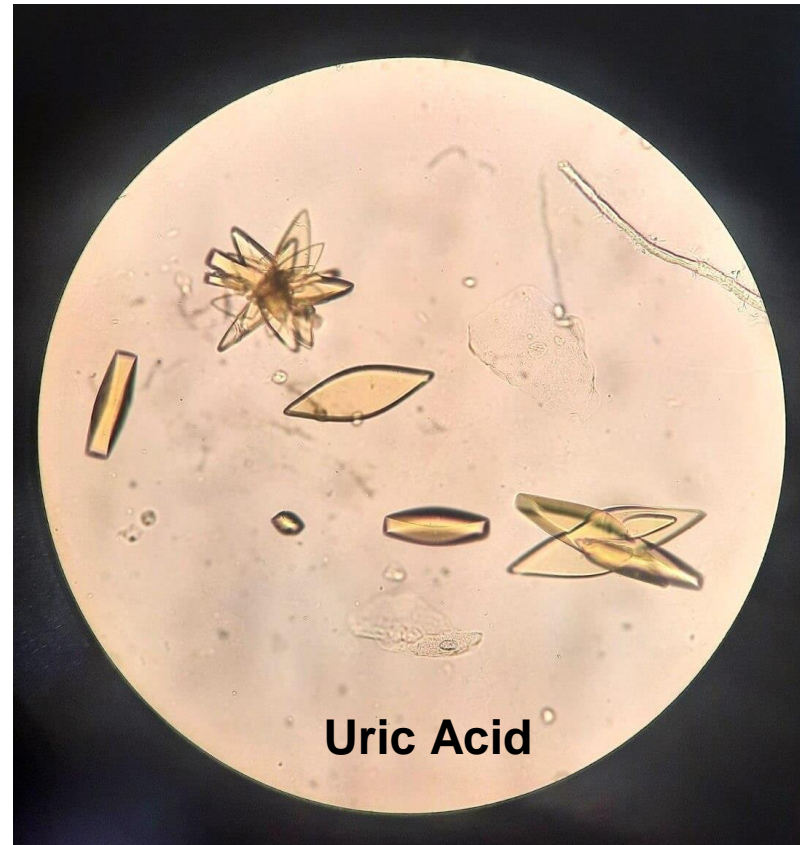
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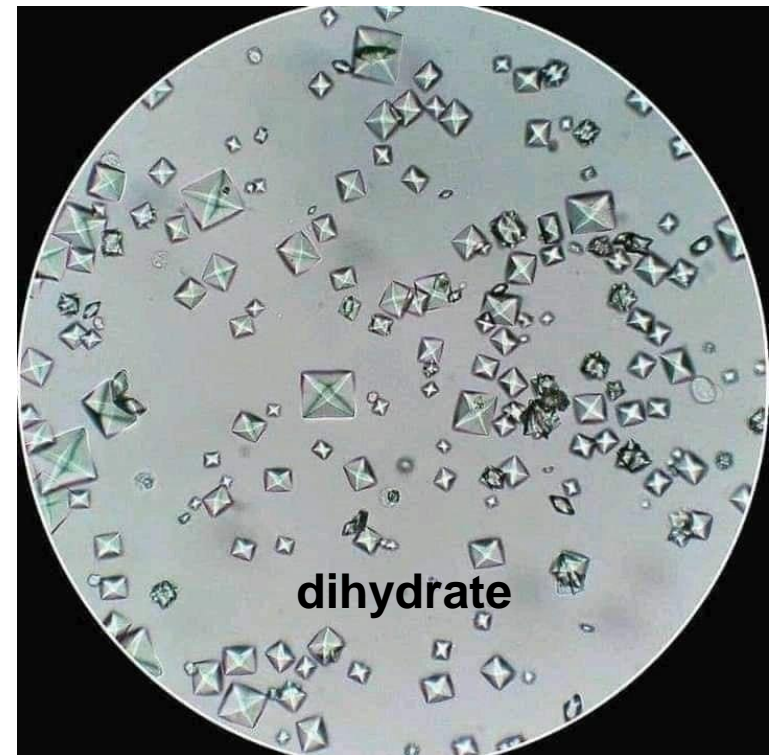
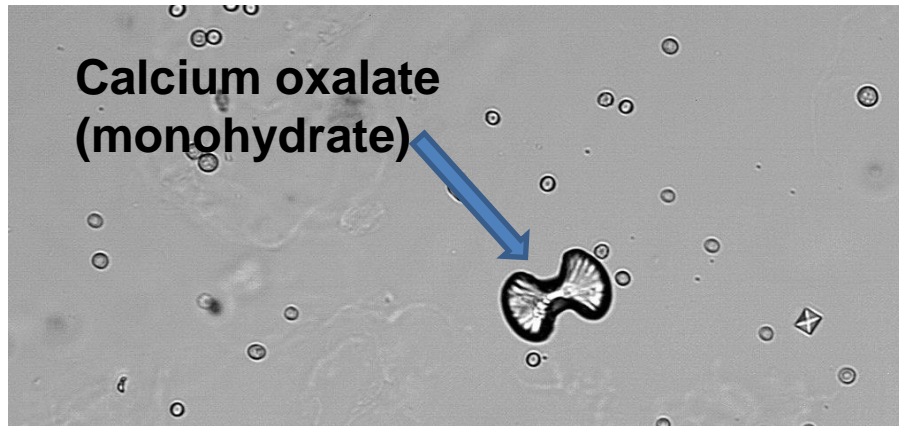




Crystals

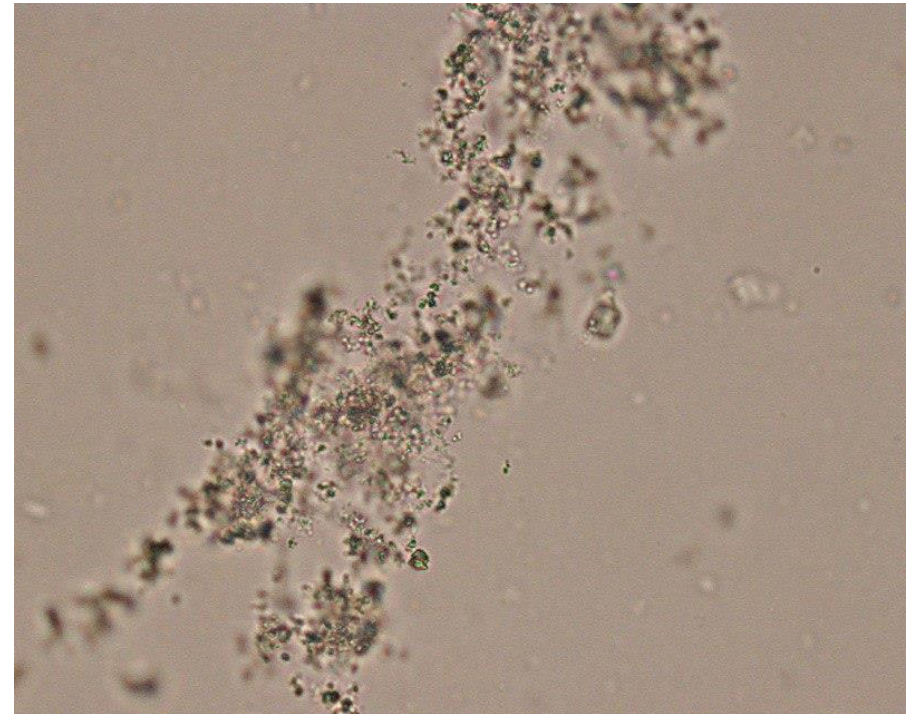
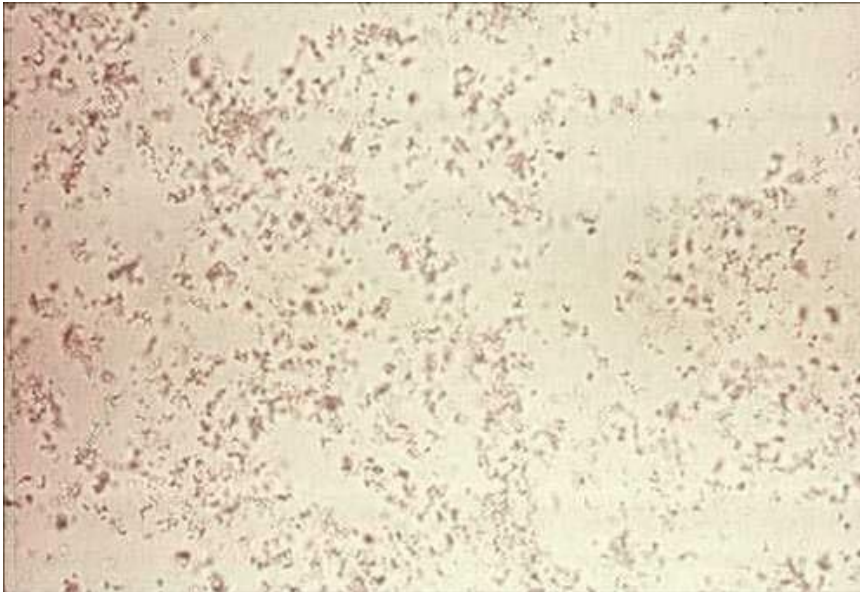
- Uric Acid
- Calcium oxalate (monohydrate)
- Calcium oxalate (dihydrate)
- Triple phosphate



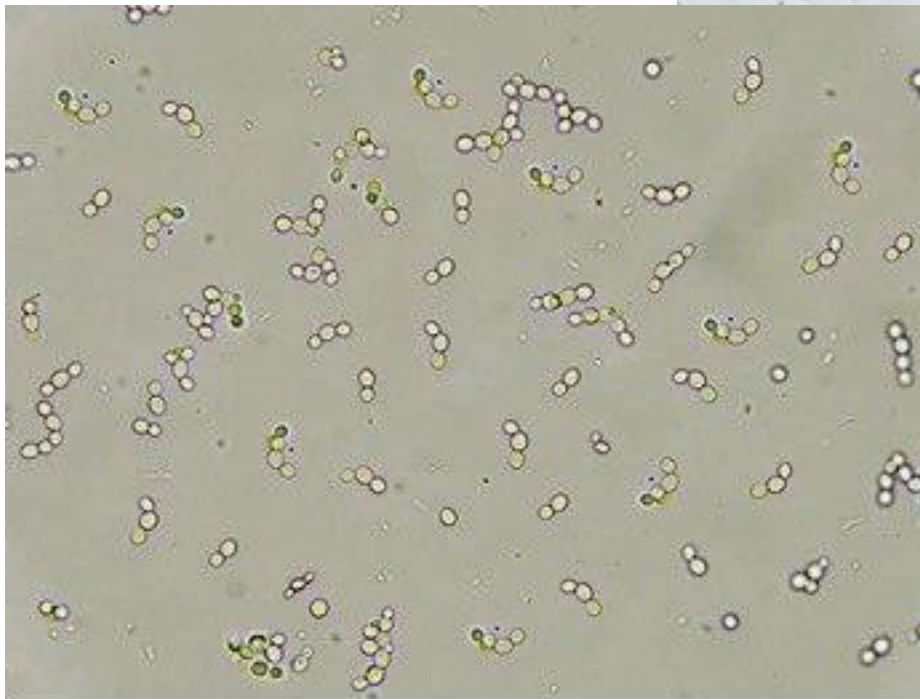


Amorphous crystals

- Amorphous urates
- Amorphous phosphates



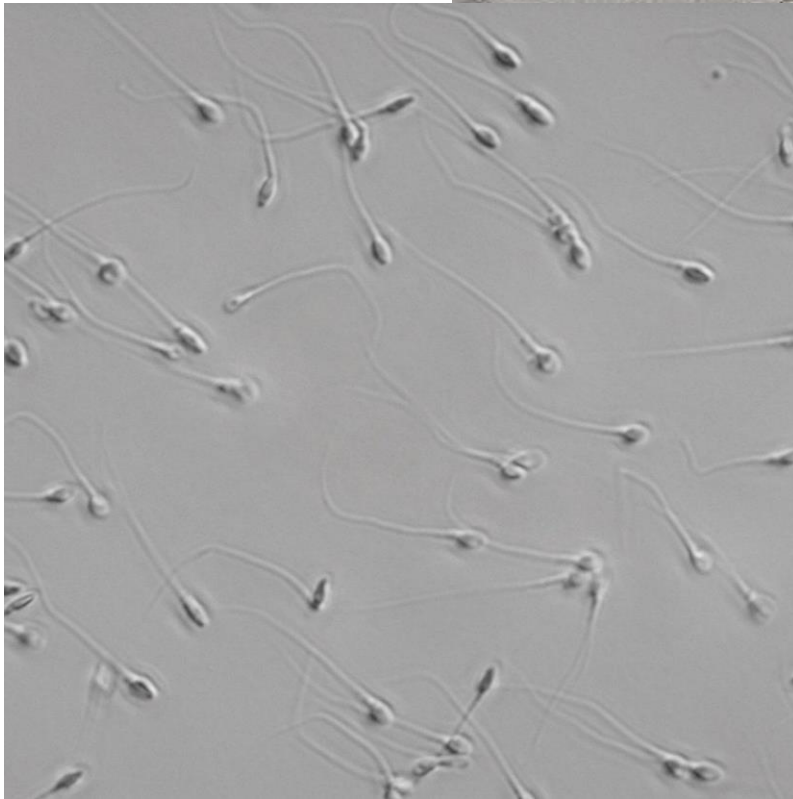
Yeast



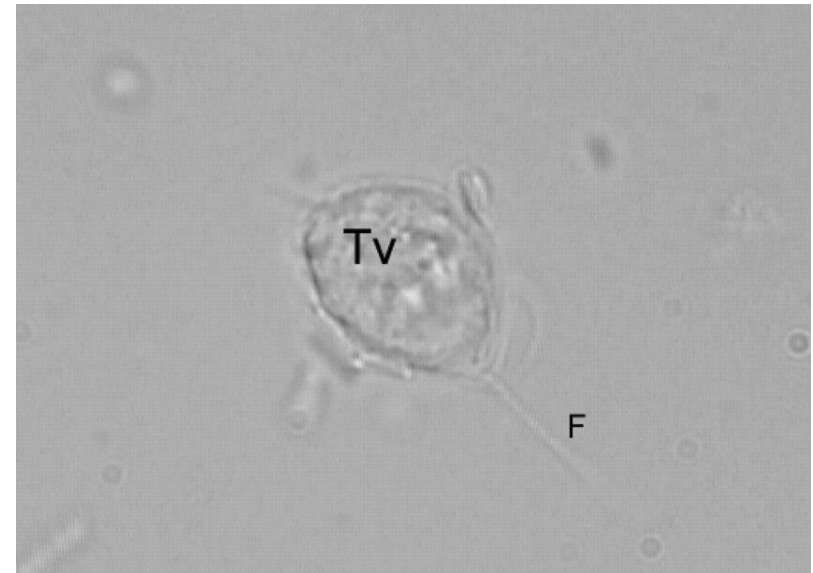
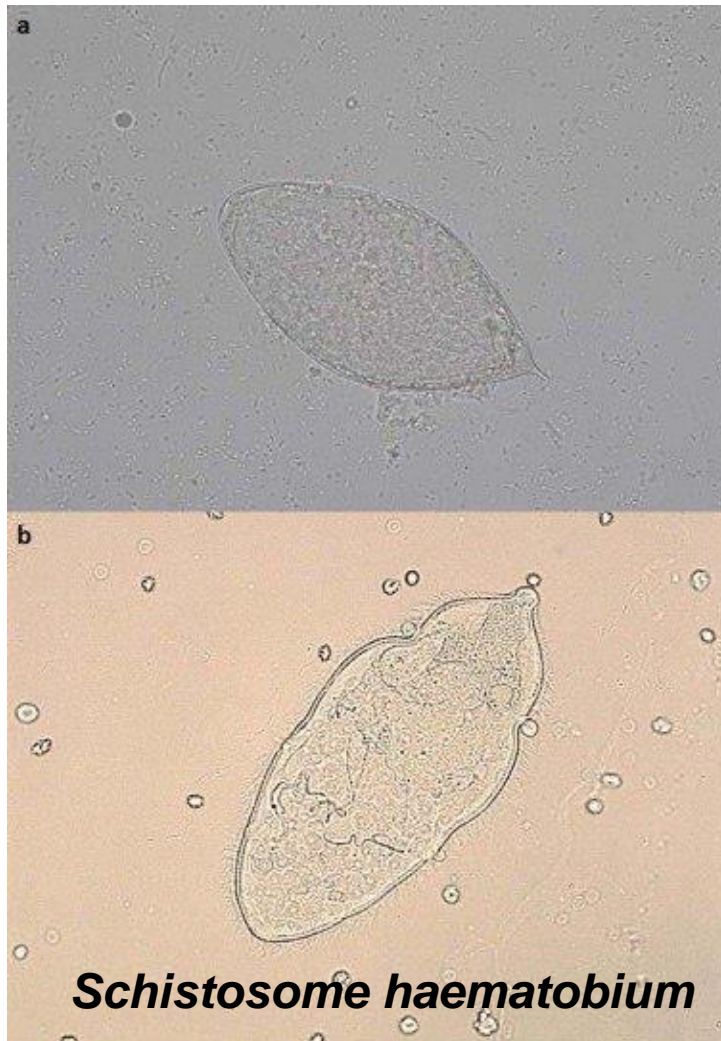
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sperms



Parasites (urine ova)



References

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