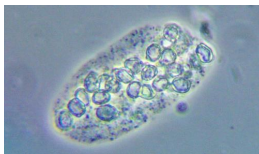
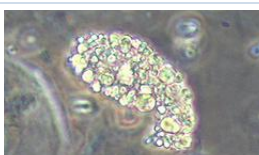


Urine casts: phase contrast

Seven cast types, identifying features, and common look-alikes

Casts form in renal tubules in a uromodulin protein matrix. Identify the matrix first; loose cell clumps can mimic casts.

Phase contrast: makes faint structures visible through differences in refractive index. Bright edge halos are optical effects, not extra cast material.

Photo	Cast and identifying feature	Association and look-alike
	Hyaline · 400× Pale matrix with parallel sides; phase contrast makes the faint outline more visible.	Concentrated urine, exercise, or renal disease; a few may occur without disease. Look-alike: Mucus tapers and varies in width.
	Red cell · 400× Red cells held within a continuous matrix.	Bleeding within the nephron, especially from a glomerular source. Look-alike: Free red cell clumps have no enclosing cast matrix.
	White cell · 400× White cells in a matrix; look for granular cytoplasm and lobed nuclei.	Renal inflammation, including pyelonephritis and interstitial nephritis. Look-alike: Tubular cells or white cell clumps can resemble a cast.
	Tubular epithelial · 400× Tubular cells with single round nuclei and visible cytoplasm within a matrix.	Tubular injury. Degeneration can obscure the cell type. Look-alike: White cell and tubular cell casts overlap; compare nuclei, not size alone.
	Granular · 400× Coarse or fine granules fill the matrix as cells and proteins break down.	Numerous muddy brown casts support tubular injury. A few granular casts are less specific. Look-alike: Debris or crystal clumps lack a continuous cast outline.
	Fatty · 400× Refractile lipid droplets within a matrix; some show Maltese crosses in polarized light.	Lipiduria, often with heavy proteinuria. Look-alike: Starch also forms crosses; confirm droplets within a cast.
	Waxy · 100× Highly refractile, sharply outlined matrix; cracks, notches, and blunt ends.	Prolonged tubular stasis, often with advanced renal impairment. Look-alike: Fibers have irregular edges and lack a cast matrix.

Scan low power; identify contents at higher power. Delay and dilute alkaline urine can destroy casts; centrifugation can break or lose them. Broad describes width, not contents. Interpret with other urine findings using the laboratory's reporting method.

Photos: Bert Grijzen, *Microscopic Urine Examination* (2026). CC BY-SA 4.0. Cropped; colors unchanged. Magnifications are source values, not print scale.

Full explanation and sources: latticeMLS.org/guides/urine-casts/

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