

# Lugol's solution

Lugol's solution is an aqueous solution of elemental iodine and potassium iodide used as an antiseptic and mucosal disinfectant, it is the basis of Gram staining. It is used for the detection of starch in laboratory tests and as a source of iodine for marine aquariums. It was named after Jean G. A. Lugol, a French physician who dealt with skin diseases, scrofula and tuberculosis. In 1829, he prepared a solution that later proved ineffective. It was later used to treat thyrotoxicosis.

## Preparation

The solution consists of 5 parts of elemental iodine and 10 parts of potassium iodide dissolved in distilled water to a total content of 130 mg / ml. Unlike iodine tincture, Lugol's solution does not contain any alcohol.

Utermöhl preparation: Dissolve 20 g of KI in 20 ml of distilled water in a 100 ml volumetric flask, add 10 g of crystalline iodine after dissolving it. Make up to the mark with distilled water and add 5 g of sodium acetate.

## Use

- Gram staining of the crystal violet complex with Lugol's solution is the basis for Gram staining of bacterial cells. After fixation of the slide and overlaying with crystal violet solution, the slide is rinsed and then overlayed with Lugol's solution for 1 minute. Bacterial differentiation is then determined by the different properties of the bacterial wall.
- Starch presence indicator in laboratory tests. Starch is composed of amylopectin  $\alpha$ -amylose. A-amylose is well stainable with Lugol's solution due to its helical structure. After penetration of the solution, a characteristic dark blue color develops.
- Stain the nuclei in cell staining.
- It highlights events on the cell membrane, allows better observation of diffusion and osmosis.
- Schiller's test: during colposcopy, the cervix is smeared with Lugol's solution. Physiological cells stain due to the high amount of starch, while pathological tissue defects do not.
- Treatment of thyrotoxic crises during hyperthyroidism.

## Links

### Related articles

- Gramovo barvení

### References

- VOKURKA, Martin and Jan HUGO, et al. *Great medical dictionary*. 5th edition. Prague: Maxdorf, 0000. 1008 pp. Jessenius; ISBN 80-7345-058-5 .
- JULÁK, Jaroslav. *Practical exercises and seminars in medical microbiology*. 2nd edition. Prague: Karolinum, 2009. ISBN 978-80-246-1141-9 .