Sternheimer-Malbin
Staining concentrate for urine sediments

Principle
Sternheimer-Malbin concentrate is a dyeing agent for the detection of so-called Sternheimer-Malbin cells (urinary leukocytes) in urine sediments.

Reagent
Unfavourable conditions (cold, long storage of already opened bottles) may result in dye precipitation. These can be removed by centrifugation with the highest possible speed or filtration.

Contents / Main Components
003503-0010 1x 10 ml Sternheimer-Malbin ready for use.
003503-0100 1x 100 ml Sternheimer-Malbin ready for use.
100 ml contains: 100 mg Gentiana violett C.I. 52535, 250 mg Safranin-O C.I. 50240, 25 mg Ammonium oxalate, 10 ml Ethanol, Stabilizer, non reactive components, Aqua p.a.

The ready for use solutions are stabilized and have a shelf life of at least 3 month after opening.

Risks and Safety
Please observe the necessary precautions for use of laboratory reagents and body fluids. Applications should be performed by expert personnel only. Follow the national and laboratory internal guidelines for work safety and infection control. Wear suitable protective clothing and disposable gloves while handling.
It is important to ensure effective protection against infection according to laboratory guidelines.

Equipment
Microscope, centrifuge, standard laboratory equipment.

Specimen
For detection of Sternheimer-Malbin cells use exclusively fresh urine (not older than 2 hours).

Procedure
Transfer 10 ml of the fresh (midstream) urine sample into a conical centrifugation tube. Use within 2 hours. Centrifuge at 1000 ... 1500 rpm (400 ... 500 ×g) for 5 minutes.
Drain off the supernatant up to a residual of 0.5 ml. Alternatively remove the supernatant using a water-jet pump with a glass capillary or a disposable transfer-pipette. Add 2 drops of Sternheimer-Malbin concentrate to the 0.5 ml sediment (ca. 50 µl - 60 µl max.). Mix the sample manually or with a rotary blender. Incubate the sample at room temperature for at least 1 minute to ensure complete staining.
Put a drop of slightly shaken up sediment onto a microscope slide and cover with a cover glass. Microscopic examination is carried out immediately and usually at a magnification of 400×.

Morphology
The morphological structures of sediment components correspond to those of an unstained sediment. For this purpose, please compare the images of the literature available for urine sediments.

Evaluation Leukocytes
Red colored leukocytes:
Cells translucent with light to dark red color [4].

Blue colored leukocytes:
Cells translucent, nucleus indistinct defined from plasm and always static (non-moving) granules. Smaller than "vital" leukocytes [3].

Blue colored "vital" leukocytes:
(Synonyms: Sternheimer-Malbin cells, glitter cells)
Pale blue to blue colored, slightly vesicular enlarged, irregularly shaped. Nucleus visible. The granules appear with vivid vibrant movement [4].
The color of the cells changes slowly from initially blue over purple (mixed color) to red [6].
The speed of the process is dependent on various factors:
• dye concentration
• temperature (heat source: microscope lamp)
• time of exposure
• osmolality of the stained sample
• condition of the leukocytes (vitality, age)
The color change is often associated with a decline of granules agility, which suddenly can start again. A burst of cells with (spherical) leakage of the cytoplasm is then frequently observed [4].
After hours, only red cells can be detected.

Diagnosis
According to Sternheimer and Malbin, the Sternheimer-Malbin cells are characteristic for pyelonephritis [1].
This was confirmed in several subsequent studies [5] [6].
The assumption is often referred to a cell ratio of > 10%.
The information is given without warranty. Data from our own studies are not available. For diagnosis, please refer to the literature.
**Notes**

**Classifications**

EU: EDMA: 11 70 02 10 00; IVD Class A.

AU: Class I; IVD.

CA: HC: Class I; exempt; for in-vitro diagnostic use.

US: FDA: JCG; Class I; exempt; for in-vitro diagnostic use.

**Support / Information service**

For methodological and technical support, please contact us by eMail at support@bioanalytic.de or by fax (German, English).

Periodically check for updates of this product information on our website.

**Waste Management**

Please observe your national laws and regulations.

Used and expired solutions must be disposed of in accordance with your local regulations.

Inside the EU, national regulations apply that are based on the current, amended version of Council Directive 67/548/EEG on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

Decontaminated packaging can disposed of as household waste or recycled, unless otherwise specified.

**Literature & Footnotes**

Legends for the graphic symbols and tags used follow relevant norms or are available on our internet pages.


