Glutathione

see **Oxidation status**

General:

Glutathione is a tripeptide, which consists of the three amino acids glutamine, cysteine and glycine. Glutathione was first described as a part of yeast. The structure of the sulfurous tripeptide was revealed in 1935. Glutathione is one of the most important antioxidants in the cells. It is formed in liver. Its quantity depends on cysteine supply from food. Glutathione is present in almost all cells in high concentration, whereby the ac-tive, reduced glutathione is in balance with glutathione disulfide.

Glutathione supports liver detoxification processes of chemicals and toxic substances, for example cadmium. Glutathione is involved in the repair of DNS damage. The anti-oxidative capacity of the glu-tathione redox system is calculated on a ratio of reduced to total glutathione.Glutathione is used for many processes in metabolism. It protects structures of proteins and helps to transport amino acids through cell mem-branes. Glutathione plays a particularly important role in the anti-oxidative defense system. It is active together with the selenium containing enzyme – glutathione-peroxidase. Glutathione can detoxify free radicals and process oxidized vitamins C and E. The active, reduced form of glutathione is relatively unstable and is quickly metabolized especially in oxidative stress. Glutathione is further important for the immune system; especially in lymphopoesis. It contributes to the formation of leukotrienes (mediator substances), controlling leukocyte function in inflammatory disorders and other immune reactions.

The following test are available:

- **Glutathione, total**

  Indication: Differentiation of antioxidative capacity
  Material: 3 ml + 5ml CPDA-blood
  TAT: 7-12 days*
  Method: HPLC
  Units: umol/l
  Ref.- range: 760 - 1200

- **Glutathione, reduced**

Indication: Differentiation of antioxidative capacity
Material: 3 ml + 5 ml CPDA-blood
TAT: 7-12 days*
Method: HPLC
Units: umol/l
Ref.- range: 670 - 970

- **Glutathione-peroxidase**

General: Glutathione peroxidase is a cytosolic, selenium-containing protein, preventing together with glutathione an accumulation of hydrogen peroxide and lipid hydroperoxide.
Indication: Additional parameter for the estimation of the antioxidative capacity
Material: 3 ml + 5 ml EDTA-blood
TAT: 7-12 days*
Method: Photometry
Units: U/g Hb
Ref.- range: 27.5 - 73.6

- **Glutathione-reductase**

General: Reduced glutathione is essential for the erythrocyte metabolism. Deficiency of glutathione reductase leads to disturbances in the glutathione redox system and thus to a shortened life span of RBCs with membrane defects and anemia. Glutathione reductase also acts as an anti-oxidative agent. Hydrogen peroxides and lipid peroxides are metabolized in the glutathione cycle in a reaction catalyzed by glutathione peroxidase.
Indication: DD acute hemolytic crisis (particularly after intake of oxidizing substances), DD hemolytic anemia, family history positive for enzyme deficiency, unclear haptoglobin deficiency, unclear reticulocytosis.
Material: 3 ml + 5ml EDTA-blood
TAT: 7-12 days*
Method: Photometry
Units: U/g Hb
Ref.- range: 5.0 - 11.0

- **Glutathione-S-Transferase**

General: Glutathione-S-transferase is divided into five isoenzymes and has a catalytic center with a binding site for glutathione. The function of the glutathione-S-transferase is the coupling of glutathione with numerous substances such as antibiotics, pesticides, insecticides, carcinogens and other drugs, which are converted in the body. Due to the conjugation the substrate is water soluble and can be directly secreted through bile or kidney. The glutathione-S-transferase system represents one of the most important protective systems against peroxides and cell-damaging reactants.

Indication: Suspicion of transplant rejection, additional parameter for the estimation of the antioxidative capacity.

Material: 5-10 ml EDTA-blood

TAT: 2 weeks *

Method: Gas Chromatography

Units: %

Ref.- range: > 70

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit http://www.fml-dubai.com/parameter-listings/