

Intracellular ATP – Marker for mitochondrial dysfunction / dystress

The ATP concentration in the cell is strictly regulated and is kept at a more or less stable level, even if a lot is currently being used, it is quickly regenerated. The ATP determination serves to **detect an acquired, secondary mitochondriopathy**. The test is **not suitable** for detecting an inherited, genetically determined functional disorder. A significant reduction in intracellular ATP is usually detected in the context of systemic inflammation.

Adenosine triphosphate, ATP for short, is a molecule that provides energy as a storage substance (energy currency) in every cell of a living organism. With this energy, all working processes such as locomotion or metabolic processes in general are made possible. An ATP molecule contains three phosphate groups. In order to release energy, ATP is converted into ADP (adenosine diphosphate) by splitting off one of the three phosphate residues. The formation of ATP takes place in the mitochondria of the body's cells: by splitting sugar molecules, carbohydrates, fatty acids, etc. from food, ATP, water and CO₂ are formed with the help of oxygen within the framework of the respiratory chain:

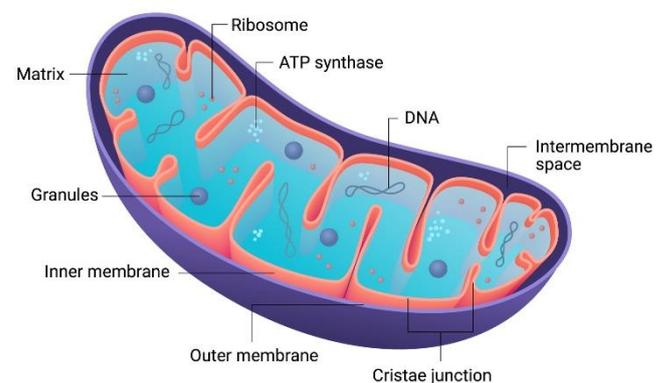
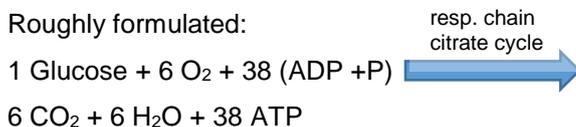


Fig. 1: mitochondrion (LDarin/Shutterstock.com)



The ATP turnover per day is on average about half the human body mass depending on the workload.

Mitochondria

They are cell organelles and function as power stations of the cell in all living organisms. They provide energy in the form of ATP. They can be damaged by environmental toxins (heavy metals, pesticides, insecticides, residential toxins, cleaning agents, cosmetics), nanoparticles, antibiotics and other drugs, but also stress and psychological pressure (mitochondriopathy). Neurological, metabolic, cardiac and oncological diseases are increasingly associated with a functional disorder of the mitochondria. Especially very energy-dependent organs/tissues are affected by a functional disorder: brain, nerves, muscles.

When is ATP reduced in the cell?

The ATP concentration in the cell is strictly regulated and is kept at a more or less stable level, even if a lot is currently being used, it is quickly regenerated. The ATP determination serves to **detect an acquired, secondary mitochondriopathy**. The test is **not suitable** for detecting an inherited, genetically determined functional disorder. A significant reduction in intracellular ATP is usually detected in the context of systemic inflammation. It often occurs together with laboratory diagnostic indications of immune activation (immune status, TNF-alpha, IP-10), and oxidative, nitrosative stress in the context of e.g. chronic inflammatory diseases such as chronic fatigue syndrome, cellular hypoxia, active viral infection, fibromyalgia, or chronic degenerative-inflammatory processes. The determination of intra-cellular ATP is therefore an **important diagnostic parameter** for mapping **current mitochondrial dysfunction**.

How is ATP measured?

Because of the high proportion of mitochondria in the granulocytes of the blood, these cells are ideally suited for the determination, as is their easy availability.

Leukocytes from heparinised whole blood are purified and ATP is quantitatively detected in a defined cell number after cell lysis by a specific chemiluminescence reaction (CLIA).

Analytics

profile: 8465, ATP intracellular

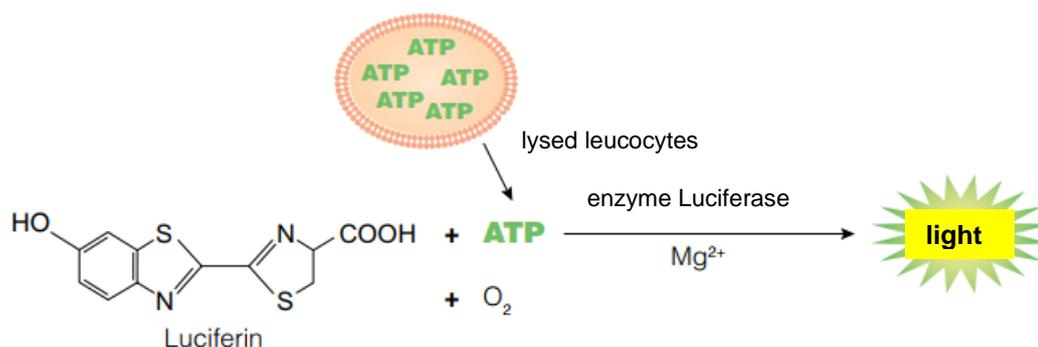
price: CHF 68.00, covered by mandatory health insurance

material & quantity: 7.5 ml lithium heparin blood, not older than 24 hours

logistics: Blood collection from Monday to Thursday, collection via courier, no postal delivery

remark: The intracellular determination of ATP is a non CE/IVD certified method.

execution time: 1 day



Literature:

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