Antioxidative capacity

General:

Oxidative stress: Oxidative stress means the discrepancy between formation and resorption of free radicals (reactive oxygen species (ROS)). Exogeneous sources of ROS are smoking, alcohol consumption, air pollution, chemical toxins, heavy metals, ozone, UV rays. Endogeneous sources of ROS are inflammations, immune defense, stress, chronic diseases and excessive physical efforts. Environmental poisons, medication etc. lead to an increased formation of free radicals in the body (oxidative capacity).

Free radicals: Free radicals react directly with cellular structures such as lipids, proteins and nucleic acids. The reaction with nonsaturated fatty acids in lipid membranes is of high significance due to increased lipid peroxidation. This can cause cell damage. The body usually reacts with repair mechanisms (antioxidants) which can be tested and differentiated in the an-tioxidative capacity.

Antioxidants: Antioxidants are natural or synthetic substances which protect cells and food from damage by action of oxygen radicals (free radicals). Especially vitamin C and E, the provitamin beta-carotin as well as certain trace elements, e.g. selenium, coenzyme Q10 are among the natural anti-oxidants contained in food.

Synthetic antioxidants (e.g. propylgallate, gallate, butyl-hydroxy-toluol orthophosphoric acid, phosphate and others) delay the oxidation of fatty acids. In potato products and other vegetables they prevent discolorations caused by the air oxygen. Antioxidants in food must be declared mentioning the sub-stance and the E number.

The following tests are available:

- **Complete oxidative capacity**

Indication:	Determination of the oxidative load
Material:	1 ml EDTA-plasma, frozen
TAT:	7-10 days*
Method:	photometry
Units:	umol/l
Ref.- range:	normal oxidative load: < 200 umol/l moderate oxidative load: 200 - 350 umol/l strong oxidative load: > 350 umol/l

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- **Total antioxidative capacity**

Indication: This screening tests the antioxidative balance and includes antioxidative protection factors. Malondialdehyde, detoxification parameters, superoxide dismutase (SOD), gluthatione-S-transferase (GST) as well as glutathione, can be defined. For the antioxidative supply, vitamin E, vitamin C, beta carotin (provitamin A), selenium and zinc as non enzymatical antioxidants, are in-vestigated.

Material: 1 ml EDTA-plasma, frozen

TAT: 7-10 days*

Method: photometry

Units: umol/l

Ref.- range: low antioxidative capacity: < 280 umol/l
medium antioxidative capacity: 280 - 320 umol/l
high antioxidative capacity: > 320 umol/l

- **Other parameters**

Enzyme Redox systems	Material
Malondialdehyde	Serum
Superoxide dismutase	EDTA-blood
Glutathione, reduced	CPDA-blood
Glutathione, total	CPDA-blood

Vitamins and trace elements	Material
Vitamin E (Tocopherol)	Serum, light-protected
Vitamin C (Ascorbic acid)	Serum, frozen
Beta-Carotene	Serum, light-protected
Zinc	Serum
Coenzyme Q10	Serum
Selenium	Serum or LH-blood (trace-free tubes)
Ceruloplasmin	Serum

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