

Information concerning patients - Practical advice and costs

A redox-analysis of your serum is only possible in our laboratory. But your personal presence is not needed! You can use our service all over Germany as well as surrounding states..

Further information is available at this homepage or you can call us. We will pleasantly help.

redox-analysis of serum

A redox-analysis of serum allows the assessment of regulatory processes of our body concerning immune defence, hormonal regulation, cellular (de)generation, and individual detoxification capacity against free radicals. We need 20 ml of blood per analysis. Serum is gained by centrifugation and frozen by -20°C until analysed. An assessment will be completed within 2 to 3 weeks.

The addition of several naturally occurring biochemical substances to the serum will cause reactions that constantly take place in our organism. In this way in molecules of serum structural and functional changes are caused which can be measured using the redox-potential of serum (sum of movements of electrons) and which reflect the individual state of health.

By measuring disorders of redox-potentials we can detect a shortage of supply and therefore can calculate an individual requirement of supplementary vital substances.

attention: big meals as well as the use of vital substances can influence results of analysis!

Sampling of blood

To undergo a redox-analysis of serum you need a general practitioner who can take your blood sample and gain your serum following our instructions. Please consider this choosing a general practitioner:

- 1) We can arrange a date for blood sampling in our laboratory or at a cooperating general practitioner in Warnemünde (Dr. Seiler: 0381-52221). In both cases you would save transport costs. Serum would then be gained in our laboratory.
- 2) In case you cannot come we can refer you to several co-operating practitioners spread over Germany or other countries who know the procedure of gaining serum for our analysis.
- 3) You can ask your personal practitioner whether he could take the sample, gain the serum and freeze it. We will then arrange the transport.

Assessment

An analysis of your sample will take about 2-3 weeks. The final assessment and your individual recommendation for supplementary vital substances will be sent to your practitioner (or to you personally when asked for) who can then explain your results. Also, we can easily arrange a date (personal or telephone call) with Dr. Heinrich or Dr. med. Ziegler to discuss and evaluate your individual assessment.

A single assessment will cost you:

Assessment (Data and results of RSA; recommendation of vital substances)
= 490,00 \$ (or \$ 280,00
respectively when liquidation by sickness insurance office). In case of private
liquidation the prices are to be settled individually.
(possible) costs of transport = 60,00 Euro (or \$ 75,00 respectively).

Sampling for redoxanalytic procedures

To guarantee the quality of our analysis we ask you to proceed as following:

1. Blood samples can be taken in routinely used tubes but NO chemical additives may be added!
2. A minimum of 20 ml of blood has to be taken.
3. Leave the blood for 15-20 min at room temperature, then cool it for 60-70 min in a refrigerator, up to plus 5° - 7 ° Celsius and never below!!
4. Centrifuge the cooled blood samples for 10 min at 3.000 U/min.
5. Immediately after centrifugation the serum has to be separated. A minimum of 6 ml is needed for analysis. Haemolytic samples may not be analysed!
6. Put name, birthday and date of sampling on the tube.
7. Fill in the formular to order analysis (signature needed).
8. Freeze the serum within 10 min after centrifugation at -22°C. Storage is possible for maximal 2 weeks, so you can collect samples for transport.
9. Call us to arrange the transport using dry ice. (Latest on Fridays to guarantee transport of samples the following Tuesday)
10. The transport may not take more than 2 days to prevent melting of the samples. Melted samples may not be analysed.
11. Add our adress: **LABO TECH Labortechnik GmbH**
Friedrich-Barnewitz-Straße 3
18119 Rostock-Warnemünde
Germany
phone: 0049-381/5196-236
fax: 0049-381/5196-113

Transport will be carried out by TNT Global Express.

Transport of samples

To guarantee the correct transport of samples we arrange the proceedings. You call us and LABO TECH will send a thermos box filled with dry ice via TNT Global express. Only frozen samples (-22°C) will be transported and will give high-quality results in our analysis. The dry ice will prevent melting during transport.

You can use this service every Tuesday (until 12:00 h). Your samples will arrive here at Wednesdays. The formular for the transport to our laboratory is placed within the thermos box.

Please don't forget to send the filled formular for redoxanalysis for each

sample you wish to have analysed. This formular will be a valid order and commits the receiver to settle with the costs. In addition transport of samples has to be paid by the receiver.

Transport of samples - request and costs

When requesting transport with dry ice or having any questions please call us until Friday at 16:00 h to guarantee transport in the following week:

LABO TECH Labortechnik GmbH
phone: 0049-381-5196-236

The costs of one transport are 60,00 Euro. Sending more than one sample the costs are divided by the number of samples to a minimum of 3,00 Euro per sample.

Vital substances

Various vitamins, trace elements and minerals of which many show antioxidative activity are termed "vital substances". Examples are the vitamins (z.B. A, C, E, B-complexes), minerals like K, Ca, P und Mg, some amino-acids (e.g. methionine, cysteine, glutamate), secondary contens of plants (e.g. flavonoide, indole, saponine), vitaminoides (Coenzym Q 10), fatty acids (Omega-3-fatty acid) and substances like choline, ginkgo, ginseng and propolis and others.

Many of these micronutrients cannot be produced by the organism but have to be taken up by food. Nutrition nowadays hardly guarantees a sufficient supply, especially not in case of disease. Therefore, daily taking of supplementary vital substances is so important.

Depending on the personal risk factors the individual requirement of antioxidants and vital substances varies. External influences (smoking, stress, mal-nutrition) or individual health problems (genetics, mal-absorption) may lead to a surplus of oxidants and to an insufficient supply by antioxidants.

When are supplementary vital substances needed?

Taking of an individual dosage of supplementary vital substances is highly suggested in case of disease:

- o After an operation/ long disease
- o In case of chronic illnesses/syndromes (HIV, EBV, HBV)
- o In case of auto-immunological disease (MS, rheumatism, M. Crohn, colitis ulcerosea, ...)
- o After antibiotic or chemotherapy
- o In case of proneness to infection
- o In case of chronic degenerative diseases of joints (arthrosis)
- o In case of metabolic or eating disturbances (diabetes mellitus)
- o In case of intoxication by e.g. environmental toxins
- o In case of chronic sleepiness and/or drop in productivity
- o Prophylaxis against heart-attack and stroke

Also, healthy people should fight an elevated oxidative burden:

- o With age
- o In case of smoking
- o During acute periods of stress
- o In case of unbalanced nutrition
- o athletes

Attention: an overdose is as harmful as a lack of vital substances! Also taking of single antioxidants can be harmful. Daily requirement of vital substances varies even concerning healthy people. Therefore, taking of supplementary vital substances should be adapted to the personal need. A redox-analysis of serum in our company makes individual statements on the requirement of vital substances possible and thus, allows its use in therapy.

Dosage and costs of supplementary vital substances

Individually composed dosages of vital substances may only be sold by pharmacies following the German law governing the manufacture and prescription of drugs. It will be a pleasure to us to help you arranging. A basic mixture of vital substances which is highly suggested to be taken even by the healthy can be ordered directly in our company.

average monthly costs
of individually composed vital substances = 180,00 - 310,00 Euro

We suggest dosage of vital substances following a 3-day rhythm of varying doses. You take for 3 days each $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$ and then full amount of the suggested maximum dose. Then you return again in 3 days rhythm back to the minimum dose of $\frac{1}{3}$ and start again to increase dosage. To guarantee a long-term success of therapy we suggest a control assessment by RSA after 6-8 weeks.

Oxidative stress

Most organisms living on this planet are dependent on the oxygen in our atmosphere. Oxygen is needed to set free the chemically-bound energy of nutrients. During respiration oxygen is reduced to water, a metabolic process that naturally results in formation of various reactive oxygen species (radicals). These are highly reactive and attack all structures of living cells. During metabolism reactive oxygen species are mainly transformed. However, about 5-6% slip from controlled transformation and have to be detoxified.

To protect the organism against oxidative damage a healthy cell uses various antioxidative defence mechanisms:
Enzymes and low molecular weight antioxidants.

Cellular antioxidative defences:

Antioxidative enzymes
copper-zinc-superoxide-dismutase
mangan-superoxide-dismutase
catalase(s)

selen-glutathione-peroxidase
glutathione-peroxidase / glutathione-transferases

glutathione-reductase

Low molecular-weight antioxidants

tocopherole

flavonoide

Phenolic acids and other plant contents

synthetic phenolic antioxidants

aromatic and heterocyclic amines

Other low molecular-weight substances (especially important for mammals) like ascorbate, glutathione, uric acid

The provision of antioxidants in cells of an organism varies. Some enzymes are inducible and will be produced corresponding to the need.

In the plasma of blood as well as in other parts of the body sulfur groups of proteins contribute to about 70% of total antioxidative capacity. But also bilirubine, Also coeruloplasmine, transferrine, cholesteroline, hormones like adrenaline and many others take major roles in antioxidative defence.

A disbalance of pro-oxidants on the one hand and antioxidative capacity on the other causes "oxidative stress". A surplus of reactive oxygen species is formed and will not be totally detoxified by antioxidative defences. These conditions can be caused by a long-term insufficient supply by obligatory antioxidants against an increased burden of oxidants due to for example environmental toxicity, changed eating habits, tobacco and drug abuse, psychological or physical pressure or due to generally insufficient antioxidative defence mechanisms. Possible effects are accumulative damages of cellular or body structures and functions resulting then in early ageing and disease. Thanks to orthomolecular research we know nowadays that most degenerative diseases as well as 70% of all disease are caused by reactive oxygen species.

Us about us

Labo Tech Labortechnik GmbH was founded in 1993 by Dr. H. Heinrich, Molecular biologist and medical biochemist, and by Dr. med. D. Hamann. Dr. H. Heinrich started to study medicine in 1959. Choosing the subject biology he concentrated his research on molecular biology and biochemistry. Five more years of additional studies at the academy of further medical education in Berlin resulted in 1987 in a degree as immunologist and medical biochemist. From 1972 to 1993 he was scientist at the university of Rostock in the department of medicine. Since 1994 he guides LABO TECH Labortechnik GmbH in Rostock-Warnemünde to medical services of diagnosis and therapy as well as further research and development.

The company concentrates on diagnosis of disease and preventive as well as therapeutic treatment by the diagnostic procedure of redox-analysis of serum samples (RSA) that was evolved by the company's founders in 1984 at the university of Rostock. The company also develops a non-invasive technology for diagnosis of human diseases and focusses on the continued research in this field.

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**Complex redox-analysis of serum (RSA) -
A new test in clinical diagnosis**

In biological systems balanced reactions of reducing and oxidising substances play an important role. Human metabolism is based on transfer of electrons. Substances which take up electrons are reduced, whereas the corresponding molecule which gave these electrons is oxidised. Oxidation and reduction are always combined in a redox-reaction. Depending on the capacity to take or give electrons the redox-potential of a substance can be measured standardised by hydrogen.

Following the second major rule of thermodynamics entropy is energetic measure of the state of order of a biological system. Any structure or function we can analyse show only momentary periods of biological action namely the regulation of biological processes. Controlled allostery of molecular structures as the major principle of biological regulation rules our functions of living.

Thus, "disease" or "Ageing" means:

Disease is characterised by an increase (reversible or irreversible) of entropy and disorder. An elevated number of uncontrolled oxidation in case of illness leads to an increase of free enthalpy so that capacity to work chemically and the degree of thermodynamical order of these substances decreases. In addition cellular structures and their functions will be disturbed by oxidation. In other words: an ill organism physicochemically shows a different biological state of order compared to healthy. This difference should be specifically measurable and should correlate with the specific illness and its severity.

Any biophysicochemical change of structure- and function especially in terms of changed regulation of an ill organism is reflected in the system of serum/plasma-lymph-tissue liquid because the organism in its entirety is realised by this system in cellular supply by nutrients, vital substances as well as signal transfer and discharge of metabolites.

Therefore, the procedure of "complex redox-analysis of serum" was developed to measure oxidative stress and burden of humans. In this test biological regulation is simulated ex vivo in vitro by adding for example ATP to serum samples, resulting redox-values are measured and compared to those of the untreated serum. From these so called relative values 21 parameters are calculated that easily help to distinguish healthy and diseased diagnostically.

Redox-analysis of serum is a new medical test to diagnose disease. Also, RSA could be useful in food control. By measuring redox-values of liquids the quality of food and human nutrition can be controlled.

Diagnosis

Measuring only absolute values (redox-potential and 8 other values) the results of this short redox-analysis of serum correspond to 85% with a clinical assessment.

Taking calculated parameters also (indices, delta-values, colorimetric values) a correspondence of 93% is found. Combined with a control after 2 weeks a sensitivity of 94,1% and a specificity of 99,4% is reached for the 21 measured values.

More than 8000 patients having cancer or multiple sclerosis underwent the procedure of redox-analysis of serum. Carcinoms mainly of bronchus, ear-nose-throat, thyroid gland, oesophagus, stomache, enterohepatopancreatic system, mamma, uterus, kidney, bladder, prostata, cerebrum as well as malignoms like sarcoms, granulomatosis of lymph, Non-Hodgkin-lymphoms and malignant melanoms were analysed

If a consequent therapy by vital substances and antioxidants is given for tumour after-care it will still take about two years to measure relatively stable redox- regulation and values.

Already shortly after the start of taking supplementary vital substances obvious at least short-term improvements are detectable which may again be followed by a crisis. A short time of so-seeming worsening of some of the measured values is caused by a re-activation of specific regulatory processes.

Relatively stable regulation of e.g. mitotic and apoptotic activity was reached after three (and a half) years of redox-therapy.

In most of the cases improvement of symptoms will need a longer-term therapy by vital substances.

The procedure of redox-analysis of serum (RSA)

A minimum of 6 ml native serum is needed for a complete redox-analysis of serum, 0.5 ml serum for each single step of the procedure. Following an incubation-time of samples with added reagents the redox-potential is measured and ist changes will be compared with the redox-potential of the pure serum (control value).

The procedure combines 4 phases:

1. physico-chemical test.

Redox-buffering capacity of serum, that is the capacity and kinetics of antioxidative detoxification, is analysed using three different concentrations of a specific oxidant (p-benzochinone). In addition an enrichment of oxidised metabolised can be measured using the control value, so that this test gradually detects a limitation of antioxidative detoxification due to an oxidative burden.

2. Biochemical test of regulation

Four more redox-values of serum samples are determined following an incubation (incubation-time of 120 min at 20° C) with each 5 mg of

- adenosintriphosphate - disodium salt (ATP)
- ATP plus 5 µg caffeine (the inhibitor of cAMP-specific phosphodiesterase - IV)
- guanosintriphosphate - disodium salt (GTP) as well as
- flavineadenine - dinucleotide / oxidised.

These substances cause allosteric regulation of (serum)proteins which can be measured as changes of seral redox-potential compared with the control value.

The use of allosteric effectors allows the assessment of

- physico-chemical stability of biomembranes / regulation of permeability (10)
- mitotic activity (11)
- apoptotic activity (11)
- the quality of metabolic regulation (12)

3. Derivation of relative values of reference (ten values):

- a) Determination of absolute and regulatory cellular injury index

- b) Determination of absolute and regulatory mitotic index as well as
- c) six differential values of metabolism.

4. Redox-colorimetry of serum:

The transformation of p-benzoquinone to the corresponding chinhydrone-radical-anion is very slow under physiological conditions in serum. Depending on the available concentration of antioxidants in serum the radical-anion reacts to a dihydroquinone.

The characteristic maximum of extinction is changed during transformation from p-benzoquinone to chinhydrone and dihydroquinone.

Therefore, serum detoxification capacity against free radicals can be detected by measuring the extinction of formed dihydroquinone at $\lambda = 500 \text{ nm}$ (maximum of extinction).

Antioxidative titer, turnover of antioxidative equivalents (based on glutathione) and detoxification capacity against free radicals ($\text{mg/ml} \times \text{sek}$) are calculated from the extinction values.

These 21 parameters and the significance of changes allow diagnostic assessment as well as therapeutic suggestions.

Redox values are specifically altered depending on the kind of illness and can be clearly distinguished from the healthy. Based on this method different symptoms and illnesses are easily diagnosed and often successfully treated by individually calculated high dosage of vital substances.