HealthBioCare GmbH

Stress Monitor Panel

![HealthBioCare GmbH logo]

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Epigenetic Stress Analysis

Prevent chronic stress or stress-related diseases at an early stage. By analysing 6 microRNAs HBC can give you personalised stress reduction recommendations based on your cellular stress level.

Reducing stress is often not that easy in everyday life. However, once the physical coping level is exceeded, it is a long road to recovery.

Support your body specifically in processing stress, based on epigenetic metabolic analyses, before stress symptoms manifest in the cells.

Your sample for analysis was evaluated according to the latest scientific findings and the highest laboratory quality standards. The evaluation of your data was then reviewed by our staff and personally approved by our laboratory supervisor. We hereby send you your personal report, which was generated individually for you by us. We would like to thank you for your trust and look forward to receiving your questions and suggestions in order to continuously improve our service.

Support your body. We support you. Your *HealthBioCare* Team

Mechanisms of Stress Regulation

Stress plays an important role in daily life and can be caused by a variety of factors. Stress induces a coordinated systemic physiological response, including inflammatory, cellular and metabolic processes, as well as their epigenetic regulation. Based on the duration of the influence of stress, the stress response can be dividided into "acute" and "chronic" and occurs in different forms.

The perception and experience of psychological stress is subjective and individual. There are large inter-individual differences and variations in perceived stress and stress reactions. The same applies to the different coping mechanisms of an organism, which depend on several individual factors. As long as the organism's coping processes are sufficient to deal with the stress, acute psychological stress in particular can produce positive, beneficial and adaptive effects.

Such beneficial stress that does not exceed an organism's coping capacity is called "eustress". If the influence of the stressor exceeds the individual coping capacity due to it's intensity or duration, psychological stress can have harmful physiological effects. Stress is therefore an important cofactor for the development and maintenance of acute and chronic diseases such as diabetes mellitus, bronchial asthma, arteriosclerosis and ulcerative colitis, but also for neuroses or depression.
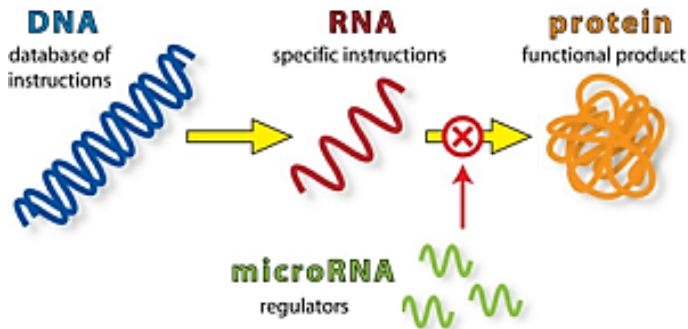
Mechanisms of Stress Regulation

Through many studies on metabolism and stress, the connection between epigenetics and the most important disease processes is becoming increasingly clear. The identification of the most important molecular biomarkers leads to new therapeutic strategies.

MicroRNAs (miRNAs) play a central role in the regulation of cellular processes, including physiological and psychological stress response pathways. miRNAs are small, non-coding RNAs that have an important regulatory role in gene expression. They are excellent biomarkers because they are found in all organs and are very stable. Several miRNAs are involved in the regulation of stress and stress responses. Changes in stress-associated miRNA levels in the blood reflect changes in the brain. Analysing the amount of the different miRNAs involved can be used to evaluate stress, but also to diagnose, prevent and treat stress-related diseases.

What are microRNAs?

How often the body reads genes varies widely and is influenced by environmental factors, diet and lifestyle. There are ways in which the information on the genes is not translated by the body. One reason for this are short pieces of RNA, the so-called miRNAs. These serve to regulate metabolic processes and can thus influence the regulation of stress.

DNA
database of instructions

RNA
specific instructions

protein
functional product

microRNA
regulators

Epigenetically Active Phytoceuticals

The intake of epigenetically active plant substances (phytoceuticals) will not reduce the amount of stress you are exposed to. It will, however, help your body to cope better with stress. These phytoceuticals can help your body defend itself against the harmful effects of stress. They interfere with the regulation of stress-controlling genes. In doing so, genes that are actively involved in coping with stress can be increasingly read and genes that have a role in the development of late effects become less accessible to the body. The health-promoting effects of phytoceuticals are closely linked to their ability to regulate epigenetic mechanisms. In addition, phytoceuticals also have a direct influence on enzymes, proteins and receptors and thus control stress-relevant signalling pathways. All of these mechanisms help you processing stress and contribute in the long term to the reduction of late effects caused by stress. This allows your body to adapt to an increased stress level and continue to function well.

Physiological Stress Level

Based on the duration of the influence of stress, the stress reaction can be divided into acute and chronic. The perception, but also the processing of stress are individually different. Each person has a different limit to which he or she can specifically respond.

Our marker for the physiological stress level is composed of the two miRNAs, stress indicator 1 and 2.

| no stress	acute stress	chronic stress
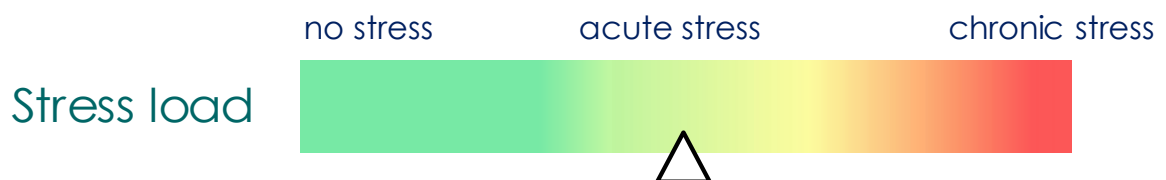
Stress load

The evaluation of the analysed markers indicates an acute stress load. Over a limited period of time, the body can cope with this. If this condition persists, the stress becomes chronic and your body will be damaged. Integrate our recommendations into your everyday life as best you can.

Risk of long-term Effects

Chronic and acute psychological stress cause complex changes in biological systems that affect more than just behaviour. Excessive and prolonged exposure to stress plays a role in the development and maintenance of many diseases such as diabetes, burnout, cardiovascular disease or chronic fatigue syndrome. Act now before late effects occur!

Our marker for the risk of stress-related diseases is calculated by an algorithm based on the following 5 miRNAs: serotonin regulating indicator, neuronal indicator, immune signal activating indicator, cell protection indicator and chronic stress indicator 2.
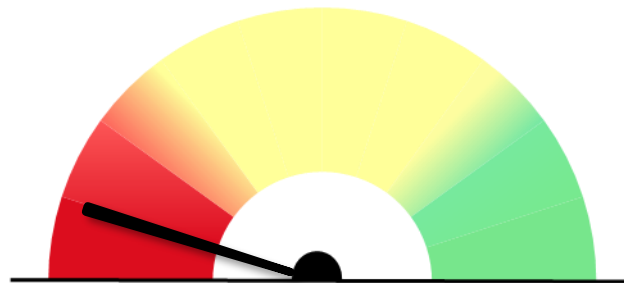
Risk of long-term effects

The evaluation of the analysed markers indicates stress-related overload. The risk of secondary diseases is high. Follow our recommendations. We will also be pleased to advise you individually.

Epigenetically Active Plant Ingredients – Based on your Analysis

Active ingredient		Marker	Occurence or activated by	Amount to be consumed	Comment
Butyrate	✓	acute stress indicator 1	pectin: apple, rosehip, citrus peel inulin: Jerusalem artichoke, artichoke, salsify, chicory, parsnip.	at least 30 g pectin or inulin / day e.g. 100 g chicory or 200 g artichoke	butyrate is produced during fermentation through the degradation of prebiotic carbohydrates (pectin and inulin) in the intestine
	✓	immune signal activating indicator			
	✓	cell protection indicator			
Quercetin		chronic stress indicator 2	onions, capers, lovage, chives	at least 200 mg quercetin / day e.g. 125 g capers or 500 g onion	quercetin is sensitive to heat
Epigallocatechin gallate (EGCG)		chronic stress indicator 2	unfermented tea e.g. white or green tea	max. 800 mg EGCG / day e.g. 1 cup of green tea contains approx. 165 mg EGCG	piperine (pepper), vitamin C and fish oil improve the bioavailability (effect)
	✓	neuronal indicator			
Oleuropein		chronic stress indicator 2	olives, as well as in olive leaves and argan oil	100 mg oleuropein / day e.g. 1 tbsp. olive leaves with 250 ml boiling water, infuse for 20 min (strain set!)	leaves have a higher concentration (3000-fold), but very bitter and tea should be mixed with juice
Resveratrol		chronic stress indicator 2	in the peel of grapes, raspberries, cranberries, red currants and strawberries	150 mg / day	the amount of resveratrol is very difficult to cover through the diet
	✓	neuronal indicator			
	✓	immune signal activating indicator			
Folate	✓	serotonin regulating indicator	green leafy vegetables, such as spinach, kale, broccoli, parsley, but also in chickpeas and lentils	300 µg folate / day e.g. 200 g kale or 200 g spinach	smoking reduces the uptake of folate; sleep deprivation has a negative effect on this marker
Poly Unsaturated Fatty Acids (PUFAs)	✓	immune signal activating indicator	fatty fish such as salmon, nuts such as walnuts, avocado, algae, vegetable oils from rapeseed, linseed or olive	250 - 500 mg omega-3 / day e.g. 100 g fatty fish or a handful of walnuts	omega-3 (e.g. DHA, ALA) and omega-6 (z.B. LA) fatty acids
	✓	cell protection indicator			
Berberin	✓	immune signal activating indicator	in the bark of barberry and orangeroot	max. 500 mg berberine e.g. 1 tsp. barberry root bark with at least 1/4 boiling water (strain set!)	barberry root bark tea from the Ayurvedic medicine
Curcumin	✓	cell protection indicator	curcuma	max. 300 mg curcumin / day e.g. 5 - 10 g curcuma powder	pregnant or breastfeeding women and patients with gallstones should refrain from taking food supplements
Gingerol	✓	cell protection indicator	ginger root	max. 5 g ginger powder / day or 50 g fresh ginger / day	during pregnancy ginger should only be taken with the consultation of a doctor
Sulforaphane	✓	cell protection indicator	cruciferous vegetables, such as cabbage and broccoli, especially in broccoli sprouts	25 mg sulforaphane / day e.g. 250 g broccoli	tip: steam broccoli briefly or enjoy it raw, otherwise there is less sulforaphane

✓ Based on your epigenetic stress analysis, we recommend that you increase your intake of the substances marked in the table below. If no substance is marked, it means that your miRNAs are above the recommendation threshold.