

Ralf Meyer: Chronically Healthy

The prevention and therapy of today's civilization diseases according to Dr. med. Heinrich Kremer's original concept of cell symbiosis therapy®

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1. Mitochondria

This first chapter is decisive for understanding the whole book and Cell Symbiosis Therapy (CTS) model

Introduction

Dr. Kremer's many years of research have led to a considerable broadening and deepening in the understanding of the processes in our cells. Central to this understanding is the role of mitochondria. This can only be made comprehensible with the help of evolutionary biological knowledge as to how two completely different cell types united in a unique act of symbiosis – cell symbiosis. Using this as a basis we can begin to understand, with a previously unknown precision, how and why the civilization diseases of today, including cancer, come into being and where there are specific opportunities for treatment. At first, however, it is important to understand wherein this revolutionary knowledge of cell symbiosis therapy of cellular functions lies.

The Basics

Physical, mental and spiritual health are, amongst other things, dependent on:

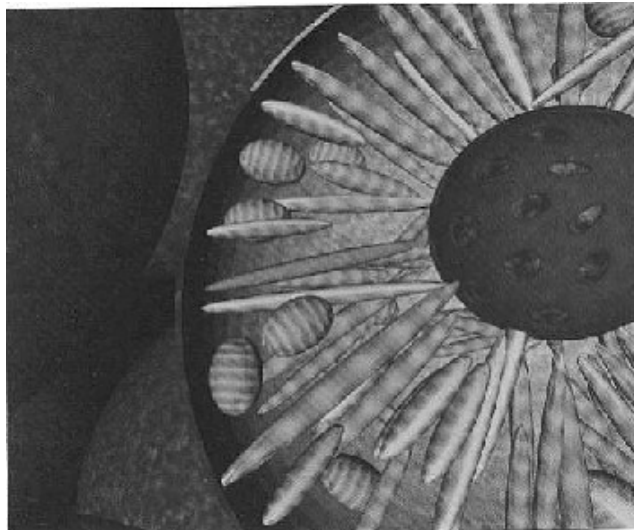
- Cell performance and cell division
- Cell death and cell regeneration
- Cell damage/infection and cell repair
- Lack of and balance of micro/macronutrients
- Cell toxication and cell detoxication
- Defense against pathogens
- Cognition of harmful and harmless, of useful and useless
- The governing of these processes

This applies to the maintenance of the functions of all cells and organs.

Cell Performance, Cell Division and the Hermaphroditic Nature of Human Cells

Who or what governs the lifespan and performance of human cells and organs, how can they be maintained and stabilized? Is this actually possible or are their functions subject to a series of coincidences? Do living conditions play a role in the origins of diseases and regeneration disorders? Can one single deficiency of a micro/macronutrient trigger systematic disruptions and diseases like diabetes, cancer, circulation disorders, MS, impotence, muscular atrophy and Alzheimer's disease or favor these diseases? What is the role of chronic inflammations in the origins and therapy of chronic diseases? And what about environmental toxins like heavy metals. Can they be broken down and expelled?

What is the role of our mucosa, the immune system, and the intestines in all this? Can a deficiency in minerals, vitamins, amino acids, trace elements or secondary plant compounds contribute to cell regeneration, cell detoxication, cell longevity and cell performance? Is there an overriding system governing our health?



Somatic cell with nucleus and diverse shaped mitochondria

The Causes of Diseases

According to Dr. Kremer, increasing disruptions to cell respiration and cell performance are the primary causes of chronic diseases. These disruptions are governed with the assistance of mitochondria in the cells. This is where Cell Symbiosis Therapy comes in by regulating mitochondrial functions and improving/stabilizing their structure.

The origins are assumed to be, amongst other things, chronic inflammatory deficiencies or increased demands for amino acids, trace elements, minerals, vitamins and polyphenols that cannot be met or the impact of industrial toxins like heavy metals, but also dietary deficiencies, immune deficiencies, chronic infections, stress, electro-smog and disruptions in the alimentary organs (e.g. limited absorption capacity of the intestinal mucosa or reduced digestive capacities), as well as psychological stress and gene mutations.

The overriding, Cell Performance steering System: The Mitochondria

There are on average 1,500 mitochondria in every body cell (with the exception of red blood corpuscles). In heart muscles cells they average 2,000 and in nerve cells even up to 5,000. In the heart, mitochondria account for 70% of its weight. In the Cell Symbiosis Therapy model, disruptions to mitochondrial functions and structures play an overriding role in the origins and persistence of chronic diseases. Mitochondria are living cell organelles that have evolved from bacteria. They govern almost all metabolic and energetic performances as well as decontamination processes in all the cells in our organism that they have colonized. When mitochondria cannot work normally, then the production of energy by mitochondria is disrupted. The energy ATP is no longer produced with the assistance of oxygen but outside mitochondria in the cytoplasm and, indeed, without oxygen by fermenting blood sugar or in less serious disruptions, with oxygen but without the production of oxygen radicals.

In the process the differentiated cell performances of all organelle systems are no longer maintained but instead the cell division cycle activated. Differentiated cell performance means here nothing more than our organs having a variety of functions to fulfill: the heart is responsible for pumping blood, the stomach for producing gastric juices. All these differentiated organ activities are governed; they are dependent on the energy supplies of mitochondria. In Cell Symbiosis Therapy the disruptions to functions or structures of mitochondria play a considerable – an overriding role in understanding the origins and treatment of chronic diseases.

Possible diseases and Disruptions to Health

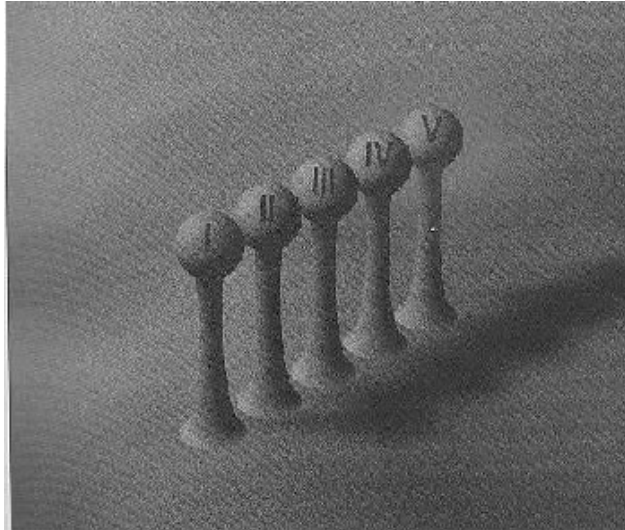
When the functions or structures of mitochondria are disrupted various disease patterns – under certain circumstances fostered by further factors – can develop:

- Circulation disorders - arteriosclerosis, cardiac infarction, apoplexy
- High blood pressure
- Immune deficiencies with recurrent viral infections (herpes, Epstein-Barr, hepatitis, etc.), fungal infections (candida, Pneumocystis carinii, molds etc.), bacterial infections (tonsil, bronchial, middle ear infections, mucosal inflammations in stomach and intestines)
- Orthopedic diseases (arthritis, degeneration of articular, bone and spinal systems)
- Diseases with chronic inflammations to the inner organs and mucosa
- Age-related diseases (Alzheimer's disease, dementia, Parkinson's disease)
- Psychiatric diseases like depressions, schizophrenia, and neuroses
- Allergies (neurodermatitis, hay fever, asthma, conjunctivitis)
- Burnout syndrome
- Impotence, frigidity
- Organ degeneration, cholesterol increase
- Hormone production disruption
- Premature ageing
- Autoimmune diseases
- Attention-Deficit Hyperactivity Disorder (ADHD)
- Cancer

2. Energy Production in Cells

Energy production using oxygen

The term mitochondrion comes from the Greek *mitos* meaning thread and *chondros* meaning grain. As already mentioned, our cell energy (ATP) is produced, or rather modulated, in mitochondria with the assistance of oxygen. If the oxygen-dependent cell respiration is disrupted, then deficiencies in the performance of the cell become apparent. 90% of the oxygen we inhale is required in mitochondria for this modulation of energy. This energy governs the cellular performance of all organs like the heart and brain, the immune system, the alimentary organs, the circulatory system, mucosal functions and blood circulation. This form of energy production within the mitochondria is also termed the 'high performance energy' model. The energy produced in this way is not only heat energy, but more importantly information energy with driving functions. Just as a computer receives its 'driving' instructions from a keyboard, without these instructions there is no response.

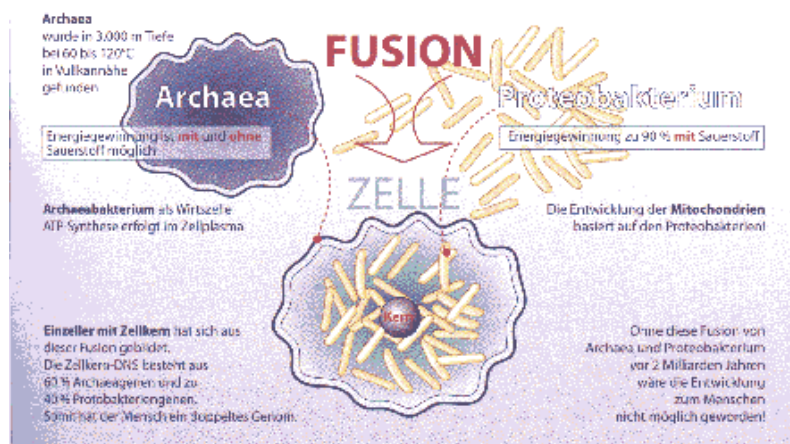


Energy production in mitochondria

The oxygen radicals - potentially damaging intermediate product for cells - created in the process are produced and neutralized in mitochondria by this cell performance governing process – on the preconditions that the mitochondrial structure has not been irreparably damaged and that there are sufficient supplies of nutrients, so-called anti-oxidative elements, for the exploitation of oxygen and the neutralizing of oxygen radicals. Dr. Kremer postulates that the B genome (B for bacteria) drives mitochondrial functions and cell performance, as they have evolved from proteobacteria. Oxygen radicals are always unavoidably produced in the process. Mitochondria are nowadays defined as endobionts. These are vital cell organelles that colonize our cells, are mobile and can communicate and fuse with each other. They have evolved over some hundred of millions of years from bacteria lingering in our cells. In a unique evolutionary act of fusion they were affiliated as host cells by archaea. Archaea, the host or mother cell of mitochondria were first discovered in some hundred of meters of water in the vicinity of active volcanoes. They are able to produce energy (ATP) completely without oxygen. This energy does not drive cell performance but cell division. This functionality is also known as the 'energy-saving' or 'cell division' model.

Humans today carry 60% of the genetic material of these archaea. When the gene portion of archaea is activated, simultaneously cell division is activated, namely by the A-genome (A for archaea). Hence, the double genome in human cells postulated by Dr. Kremer. 40% of the genetic quota of humans is made up of proteobacteria from which mitochondria evolved and 60% of the genetic proportion comes from archaea.

Cell-Symbiosis vor 2 Milliarden Jahren

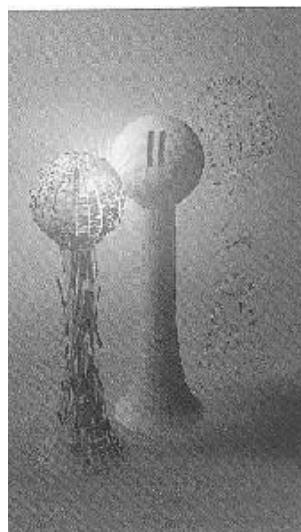


Cell symbiosis two thousand million years ago

The above illustration shows that without this act of fusion the evolution of humans would not have been possible. Accordingly, the human body is colonized and governed by several billion cell organelles. The archaea are responsible as mother cells or host cells for cell division and the mitochondria for cell performance thus forming a symbiosis.

Note: The energy produced or modulated by archaea, outside mitochondria, governs cell division. Energy produced or modulated with oxygen within mitochondria, governs all differentiated cell performance.

In the 'high-performance' energy model – mitochondrial energy production with the assistance of oxygen – highly reactive oxygen radicals are always and unavoidably formed which damage potential cells or mitochondria. If these oxygen radicals are not neutralized, cell or mitochondrial membrane components or genetic fragments could be damaged or destroyed. This means there is a possibility of cellular, mitochondrial or genetic damage. An up to 80% loss of mitochondria has been documented in tumor cells.

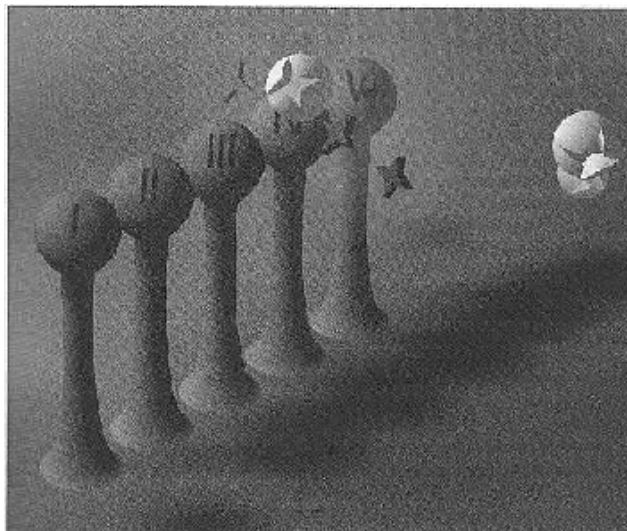


Destruction by radicals of the functional units within mitochondria

The mitochondrial respiratory chain complex, functional units of mitochondria, is required for making oxygen for energy production/modulation. If they are destroyed, then the control of cell and/or organ performance and metabolic processes in general fail or are reduced. This is why during oxygen exploitation within mitochondria the unavoidably accumulating oxygen radicals have to be 'defused', their responsiveness has to be neutralized so that they cause no cellular or genetic damage and that the balance between cell regeneration and cell death is maintained.

A similar decontamination process for neutralizing industrial toxins, which like heavy metals and agricultural toxins are absorbed via the food chain, water or air, is significant. The decontamination of the body – and as a result a reduction in 'newer' toxins – plays an important role in Cell Symbiosis Therapy in preserving the continuance and the performance capacities of mitochondria.

The illustration on the right shows 'self-produced' free radicals like oxygen radicals and NO gas that play an important role in defense against tumor cells and pathogens, proliferating within cells. But more about that later. The production of oxygen radicals and NO gas is a completely normal physiological process when the neutralizing of these radicals is indispensable to the maintenance of health of humans (and incidentally animals, too). Sulphur compounds are, in particular, decisive for neutralizing these radicals and toxins and for the maintenance of mitochondrial functions. These include, for instance, reduced glutathione, synthesized from three amino acids and produced by all mitochondria from the amino acids, cysteine, glycine and glutamic acid.



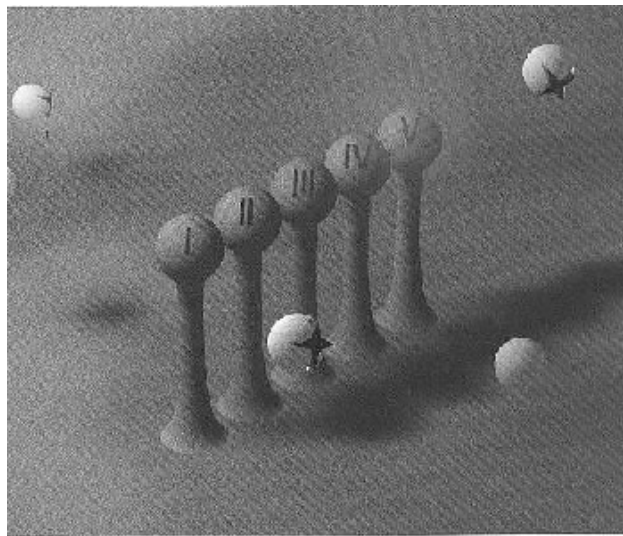
Sulphur compounds and polyphenols can neutralize oxygen radicals

But other sulphur compounds found in nature and plant extracts (polyphenols) also neutralize radicals and toxins. These classes of substances play an important role in Cell Symbiosis Therapy when the issue is the regeneration and stabilization of mitochondria and thus the cellular performance capacities and lifespan. Plant extracts, thiols (sulphur groups) and reduced glutathione represent cellular decontaminants and mitochondrial cell performance stabilizers, which can anti-oxidize more than 3,000 industrial contaminants. All cells that are colonized and governed by mitochondria possess their own decontaminating systems.

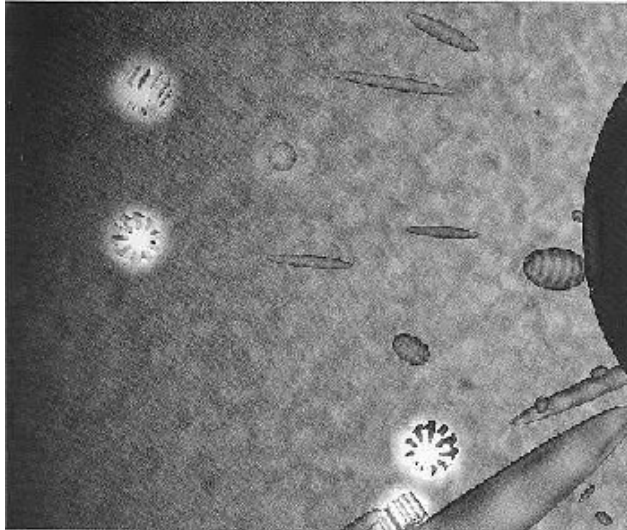
Free radicals, in our bodies, are always searching for reaction partners. They are able to trigger proper chain reactions, as they are electron acceptors, meaning that they attract reaction partners. To simplify things, just imagine that a radical is like the south pole of a magnet. This magnet searches for a reaction partner with north polarity. Once they have found each other there is an attraction and both parties 'click' together. In this way a radical can force cell wall amino acids or nuclear genetic fragments or mitochondrial components away from their compounds. In the process genetic material is possibly genetically damaged.

It is also possible, however, that mitochondria, necessary for the energy production and driving the cell functions, which are considerably more sensitive than the nuclei, as the genetic makeup of mitochondria is enclosed by a much thinner, more unstable mantle become damaged and break down.

Essential micro/macronutrients are necessary for the maintenance of the mitochondrial functions and structures of the 'high-performance' model – the control of cell functions in terms of energy production with control of cell performance as well as their own cell detoxication and anti-oxidation. These cannot be produced by self-synthesis. Essential amino acids, polyphenols, flavonoids, trace elements, minerals, vitamins, essential fatty acids and phospholipids all belong to this group. If mitochondria are destroyed or their functions disrupted their performance becomes compromised and with it the energy production with control of organ and decontamination performance.



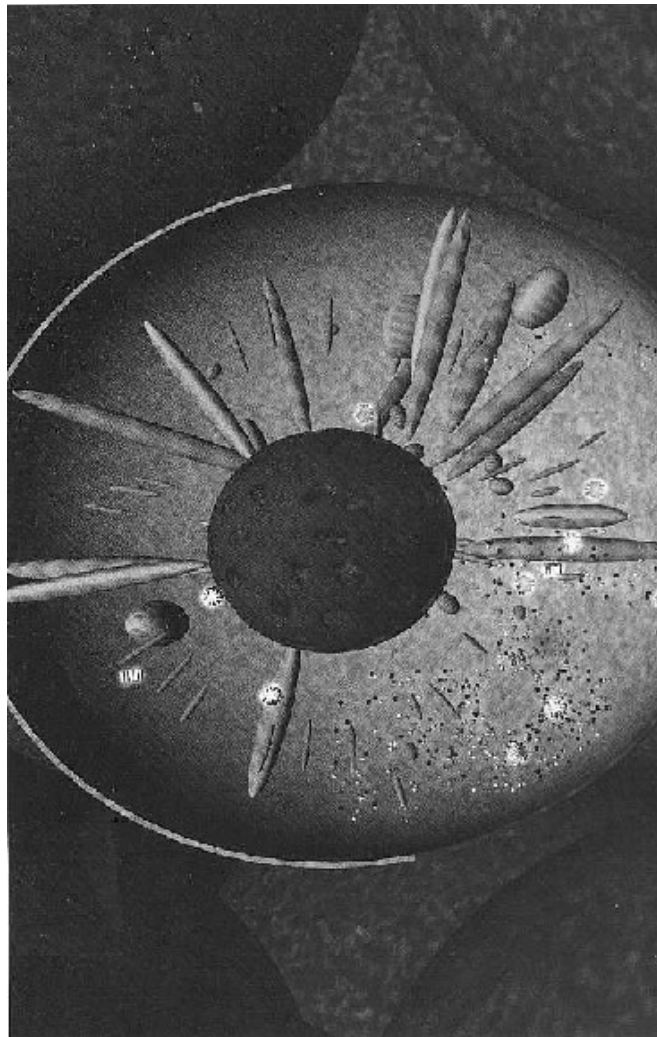
The neutralizing of free radicals by sulphur compounds



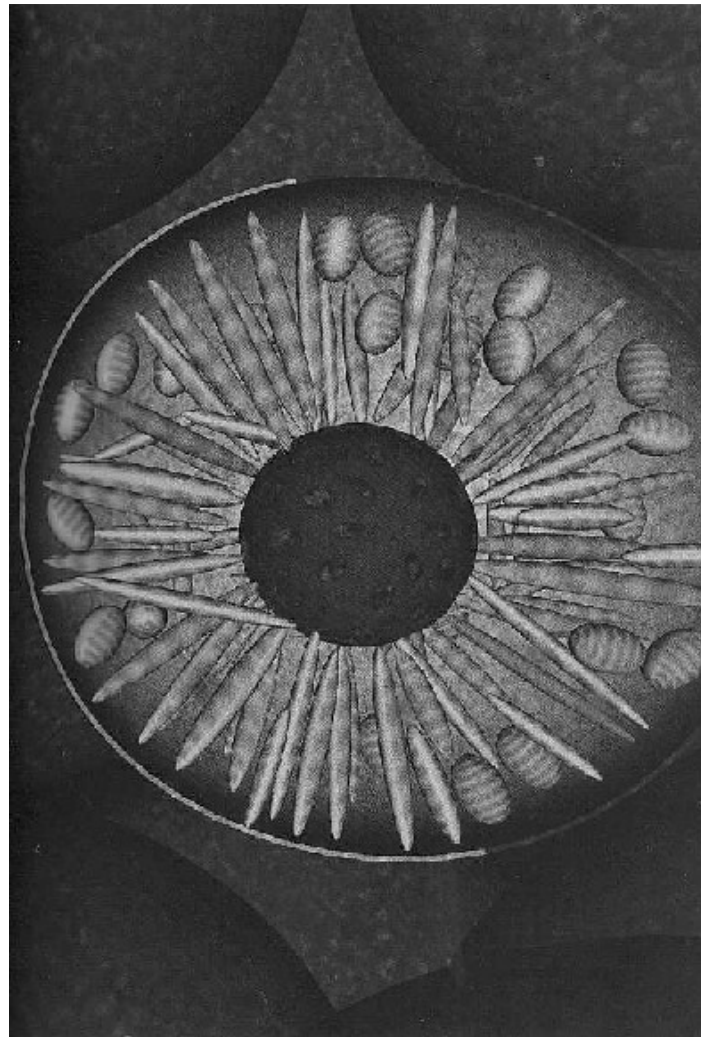
Contamination of cells by heavy metals

Protective Switch

If, for instance, in the production of mitochondrial energy the accumulating oxygen radicals or industrial toxins can no longer be anti-oxidized – ‘defused’, they can potentially cause serious damage at a cellular level. In order to protect themselves from this the mitochondria reduce their activities. In doing so there are indeed fewer oxygen radicals produced – the consequence, however, is a drop in systematic cell performance. Dr. Kremer called this process the ‘protective switch’. Here, the energy production/modulation is shifted from the mitochondria to the cytoplasm. From an evolutionary biological viewpoint the older cell division program governed by the archaeal portion of the partnership is activated. This happens in advanced stages, solely by means of utilizing blood sugar. Fixed in this mode cancer is the inevitable outcome, as blood sugar fermentation activates cell division signals.



The energy saving model of mitochondrial energy production



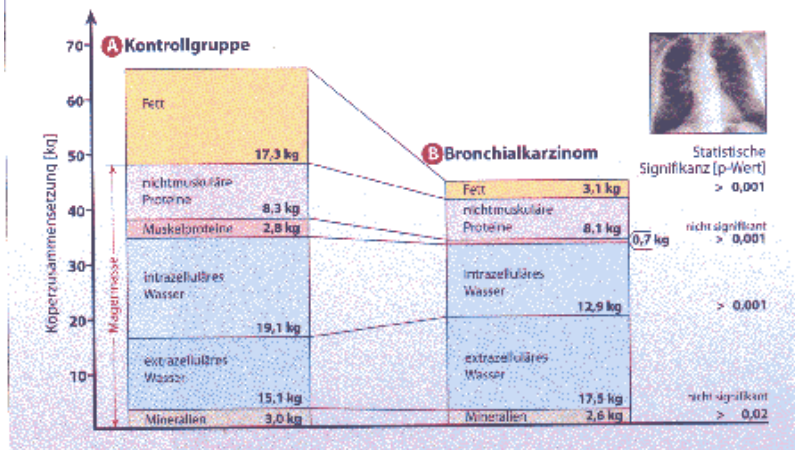
High power energy model of mitochondrial energy production

Summary

The above illustration shows the impact on cells of heavy metals, which together with other toxins and free radicals can cause a drop in oxygen utilization in mitochondria and with it a decline in cell performance.

In the process there is a switch in energy production: Energy is no longer produced within the mitochondria with oxygen but outside, in cytoplasm – and either with or without oxygen. If there is no oxygen in operation, then energy production is effected exclusively by fermentation of blood sugar, which slows down cell performance and activates cell division. Should this disruption become long-term and if such defective cells are not eliminated by the immune system, cancer could develop due to the accumulating cell division signals. The same mitochondrial dysfunction occurs when the necessary polyphenols, the essential fatty acids and amino acids, vitamins, trace elements or minerals are not available in sufficient quantities. In the process the body's own muscular and inner organ protein structures could be reduced and transformed to blood sugar. This blood sugar is in turn made available to the cells that have switched to fermenting blood sugar. The resulting loss of weight and substance is, in advanced stages, termed cachexia (emaciation). It constitutes an indication of advanced mitochondriopathy.

Chronische Krankheiten: Ursache für Kachexie



Cause of cachexia

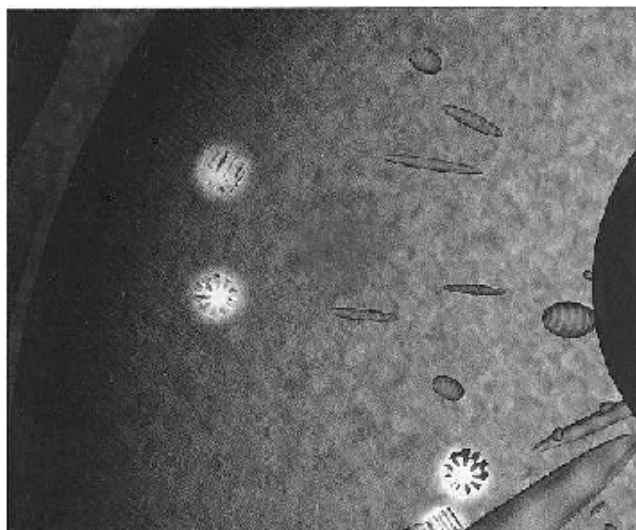
Increases in cholesterol are also a sign of disruption to mitochondrial functions, as cholesterol represents one of the building blocks of steroid and sexual hormone synthesis. The first stage of hormone synthesis takes place in the inner wall of mitochondria. If hormone production there is disturbed, then a hormone deficiency arises. Simultaneously the cholesterol levels rise, as they can no longer be utilized for hormone production due to the deficiencies in mitochondrial performance. Sexual inappetence, impotence and frigidity could be the result of this disruption. A deficiency of oxygen-transporting red blood corpuscles and hemoglobin – anemia - can also be explained by Cell Symbiosis Therapy. Hemoglobin is a compound of iron and protein that transports oxygen. The first stage of hemoglobin production takes place in the inner membrane of mitochondria. It does not seem to be coincidence that in cardiac diseases mitochondria are transported from healthy to infected cells via connecting channels. The cells have to be able to communicate with each other. The healthy cells support the infected ones by making their own healthy mitochondria available. Burnout syndrome represents a prodrome of weaknesses and deficiencies in mitochondrial performance.

Folgen gestörter Mitochondrienfunktion



The results of disrupted mitochondrial functions

When the necessary anti-oxidants and nutrients like amino acids, trace elements, minerals, thiols (sulphur groups), polyphenols, essential fatty acids and phospholipids are not available in sufficient quantities for decontaminating and neutralizing industrial toxins and self-produced free radicals, the mitochondrial functions throughout the organism can become increasingly disrupted. In the process there is a drop in mitochondrial performance and with it reduced oxygen utilization, even if there are supplies available. In fact, there are fewer oxygen radicals and NO radicals that could cause cell damage, but at the same time cell performance and thus the performance of organs are also reduced. In short, the simultaneous switch in energy production from oxygen utilization in mitochondria to blood sugar utilization outside the mitochondria in the cytoplasm (glycolysis) compromises the cell performance and stimulates cell division. Should this state remain over a period of time, then we talk about dominant cell governance by the archaeal portion of the gene. In the process gases that are cytotoxic and can block respiratory centers, like carbon monoxide or methane, could develop.

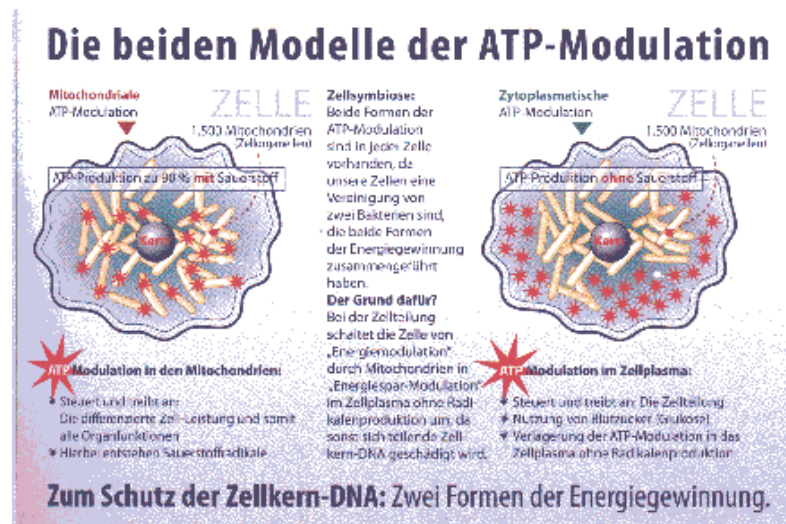


Energy production by glycolysis

In the course of these processes the acid-base levels in the cells increases. This contributes to steady division of cells whose energy production has been disrupted. Up to now, all researched tumor cells have shown too high acid-base levels. These PH values lie between 7.47 and 7.60 and are too alkaline, and not as previously assumed too acidic. The accumulating acid is called lactate and is a degradation product of sugar fermentation. It is found outside of the cells in the interstitial space. The therapeutic consequences resulting from this are discussed later. The interesting thing is the fact that all the possibilities to produce energy, both the high-performance and the austerity program, are stored in us, firmly anchored and thus are normal. The following illustration is a summarized depiction of both models of energy utilization/production: On the left the high-performance model: energy is produced from oxygen in the mitochondrion; cell performance is driven by oxygen radical production. On the right: Energy production outside the mitochondrion with blood sugar and governance of cell division.

The latter model is of enormous importance to our organism. It has to be activated for every cell division so that no cell damaging oxygen radicals form, which could destroy the dividing and thus sensitive cells. After completion of cell division, the cell switches back from blood sugar utilization to oxygen utilization, so from division back to performance, on

the precondition that the mitochondrial functions and structures are sufficiently intact. Essential classes of substances are responsible for the maintenance and activation of mitochondrial functions and structures. These are required both for the mitochondrial performance and for the synthesis of their own anti-oxidants for cellular decontamination. Consequently, in Cell Symbiosis Therapy, the factors that according to Dr. Kremer's premise and international scientific research findings block or destroy mitochondrial functions, have to be corrected. Heavy metal intoxication, intestinal absorption and defense system disruptions, polyphenol, amino acid and trace element deficiencies, food intolerance, chronic inflammations, oxygen deficiency, long-term psychological stress and electro-smog are all examples of such factors.



Two models of ATP modulation (mitochondrial high power model, left. Energy saving programme, right)

A recurrent question from patients and therapists is about the quality of today's diet. Does it cover our demands for macronutrients with essential elements? Do we need supplementary supplies of concentrations of nutrients and vital substances? Take a look at the loss of nutrients in foodstuffs in recent decades on the table below.

Nährstoffverlust durch ausgebaute Böden, Luftverschmutzung, zu schnelles Wachstum und lange Lagerung
 Vergleich zwischen einer 1985 erstellten Studie und Laboregebnissen von 1996 und 2002

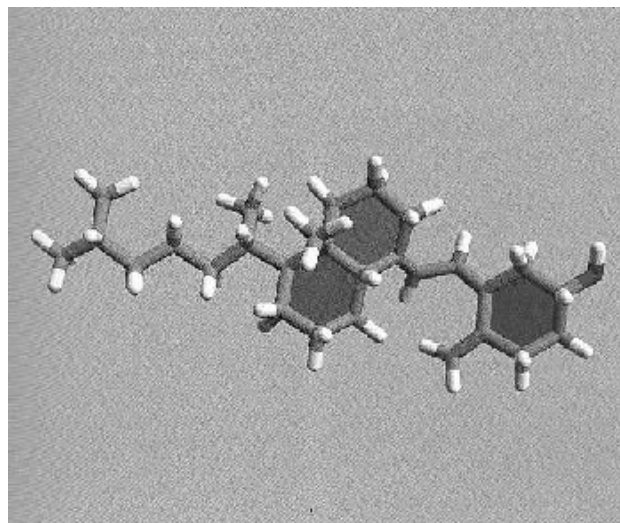
Nahrungsmittel	Inhaltsstoff	Ergebnis 1985	Ergebnis 1996	Ergebnis 2002	Differenz in %	
					1985 - 1986	1985 - 2002
Brokkoli	Calcium	103	33	28	-68	-73
	Folsäure	47	23	18	-52	-62
	Mangan	26	18	11	-35	-55
Bohnen	Calcium	56	34	29	-38	-51
	Folsäure	39	34	30	-12	-23
	Magnesium	26	20	18	-15	-31
	Vitamin B6	140	55	32	-61	-77
Kartoffeln	Calcium	14	4	3	-70	-78
	Magnesium	27	18	14	-33	-48
Weizen	Calcium	37	31	28	-17	-24
	Magnesium	21	9	6	-57	-75
Spinat	Magnesium	62	19	15	-68	-76
	Vitamin C	51	21	18	58	-66
Apfel	Vitamin C	5	1	2	-80	-60
	Calcium	8	7	7	-12	-12
Banane	Folsäure	23	3	5	-84	-79
	Magnesium	31	27	24	-13	-23
	Vitamin B6	330	22	10	-93	-95
	Calcium	21	18	17	-14	-43
Erdbeere	Calcium	21	18	17	-14	-43
	Vitamin C	63	13	8	-67	-87

Loss of nutrients from depleted soil. Source: 1985 Geigy (Schweiz) 1996 and 2002

Lebensmittellabor Karlsruhe Sanatorium Oberthal (the food laboratory, Karlsruhe/Sanatorium Oberthal)

According to the premise of Dr. Kremer, disruption to mitochondrial functions and structural damage are considerably involved in the growing number of diseases in the last century. Accordingly, all processes or toxins that disrupt or destroy mitochondrial functions and structures, potentially contribute to increasing the risks of systematic and organ-related diseases or help to cause them. Belonging to this group, according to the understandings of Cell Symbiosis Therapy, are diseases like allergies, burn-out, immune deficiency, function disruptions, and inflammations to the liver, stomach, pancreas and intestines, systematic diseases in the kidneys, nerves bones and muscles, arteriosclerosis, autoimmune diseases, viral bacterial and fungal infections, migraine, attention-deficit disorders, psychiatric disorders as well as cancer. Based on the increase in external toxin production (e.g. industrial toxins) and their absorption there is a higher demand for essential micro- and macronutrients in systematic disruptions and diseases, as the toxins have to be neutralized.

Micro- and macronutrients are indispensable to the maintenance, stabilizing and regeneration of cellular systems. Polyphenols, all essential amino acids (proteins), trace elements, minerals, vitamins, essential fatty acids and phospholipids belong to this group as already mentioned and will be covered in more detail later.



Ball-and-stick model of cholecalciferols (vitamin D3)

The importance of these classes of substances is shown by preventative studies. Women in menopause suffered significantly less often from cancer when supplied with sufficient quantities of vitamin D3 in combination with calcium. Children with sufficient supplies are less likely to suffer from juvenile diabetes, which is supposed to be incurable; men and women suffer less often from multiple sclerosis (MS). The frequency of seizures and intensity of MS relapses decrease, men suffer less often from Alzheimer's disease and impotence. However, in the process blood values are higher than the levels recommended at the moment.

In countries where curry spices are increasingly used they suffer less often from colorectal cancer and Alzheimer's disease. The polyphenol, curcumin contained in it seems to promote good health more than was previously realized. More about this in the micro-

macronutrient chapter.

Heavy metals and other toxins belong to the factors that according to the understandings of Cell Symbiosis Therapy that could trigger cancer and thus a potential long-term disruption to mitochondrial functions.

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