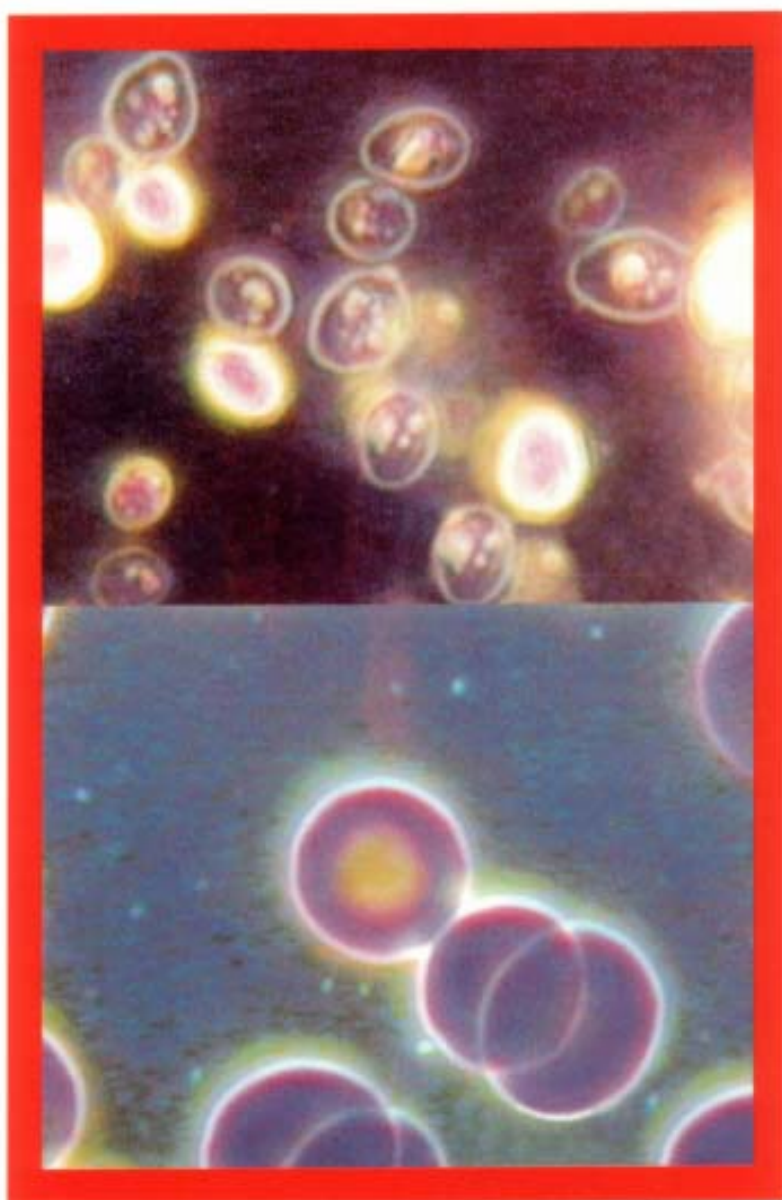


The Therapy of Enzyme Yeast Cells in Cancer Disease, C.F.S. and Aging Process.



Professor Serge Jurasunas, N.D. M.D. (Hom).

**The Therapy
of Enzyme Yeast Cells
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Aging Process.**

- New Theories on Cancer Growth and
Defence Mechanisms -

Professor Serge Jurasunas, N.D. M.D. (Hom).

Introduction

This document is based on over 30 years of clinical practice and investigation in the disease of cancer, and nearly 30 years of experience with the preparation zell-oxygen containing the enzyme yeats cells.

Today Serge Jurasunas, N.D., is one of the world authorities in the treatment of cancer using alternative/integrative therapies including naturopathy.

Dr. Jurasunas also specializes in anti-aging medicine, investigatong the biological aging process. He is the author of many scientific papers, monographs on aging, articles published in magazines, and books.

The number of recoveries of cancer, including breast, ovarion, stomach, leukaemia, sarcoma, and other cancers, illustrates his his wide knowledge of oncological practice.

Some cancer treatment protocols have been published in the Townsend Letter for Doctors and Patients (June 2000= while a complete monograph on cancer disease and therapies will be available by the end of 2001.

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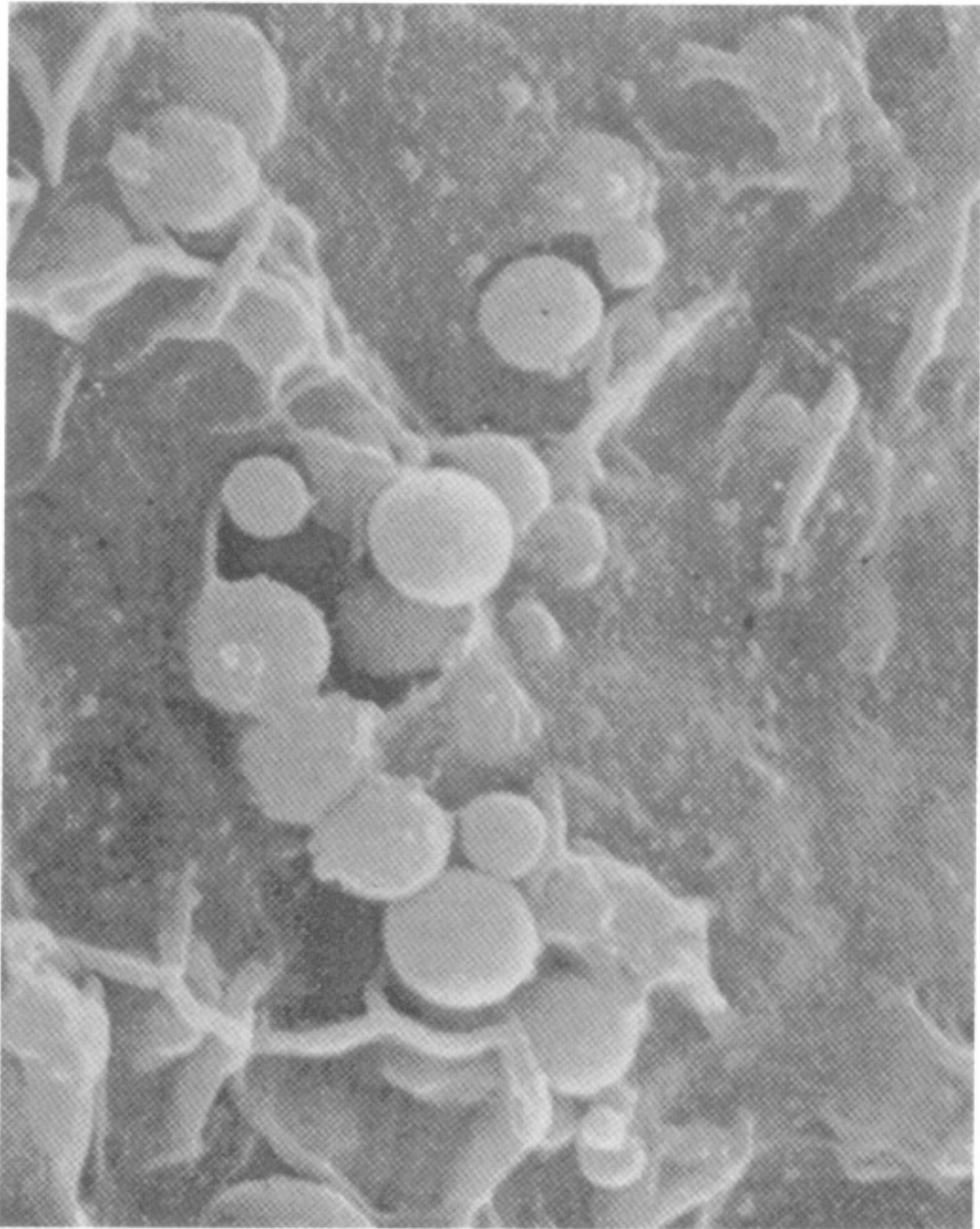
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**Cell - oxygen, enzyme yeast cells, magnified
3500 times (scanning electron microscope
Imperial University, Utrecht)**



Enzyme Yeast Cells

(Zell-oxygen preparation)

Zell-oxygen is a dietary product that essentially contains young enzyme yeast cells that provide in a natural concentrated form most of the body's need in quality and quantity. This biological product has been used for over 40 years to correct and treat organic, chronic degenerative diseases or to prevent diseases.

The nutrients contained in the yeast cells are almost identical replications of the various biological substances, which naturally occur in cells of the healthy human body.

A balanced combination of vitamins, minerals, enzymes, antioxidants, biocatalisers and nucleic acids. Thus enzyme yeast cells is a DNA nutrients and as effects on the nucleic acids of the gene, helping the gene correct errors in its DNA.

The repair DNA mechanisms of yeast is exactly the same repair as in humans. It seems therefore that we are genetically related to the yeast cells.

Enzyme yeast cells may influence the human cell's cycle, accelerate repair damage or even stimulate the P53 pathway to self-destruction.

Life extension in human species is related to the capacity of its DNA repair mechanism and self recovery and ability to synthesise nucleic acid (De Novo). These enzyme yeast cells promote youthfulness and prevent aging.

The Zell oxygen preparation is obtained from a fermentation exclusively using the the *Saccharomyces Cerevisiae*

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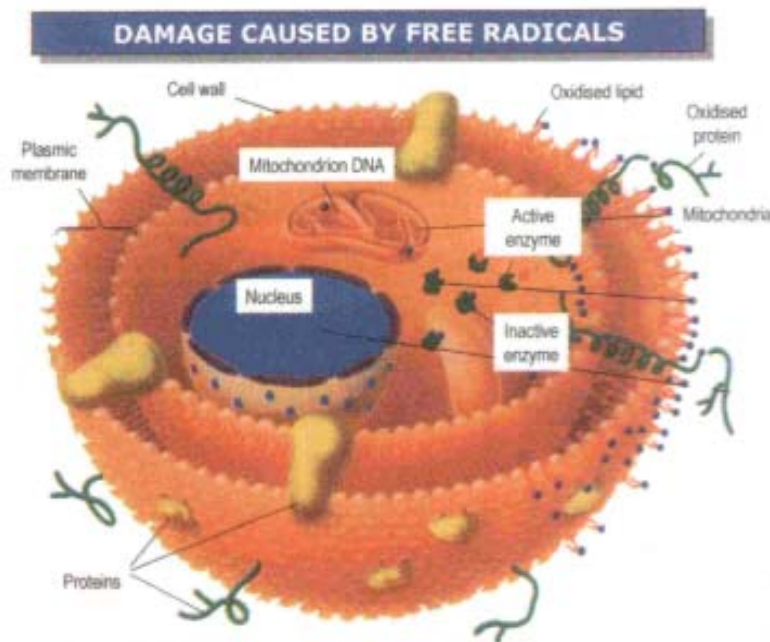
Enzyme yeast cells and the cellular respiration

One of the interesting field of research concerning the blockage of the ETC is cancer disease and many researchers, including professor Anthony Linnane (4) are now looking for a way to overcome and by pass the metabolic block in those mitochondria. A number of researchers demonstrate that enzymes and antioxidants may help to activate the R.C. in the mitochondria.

Magnesium, iron, potassium, iodine, B1, B2, B5, B12 are necessary to activate the krebs-cycle while the R.C. of the mitochondria need protective antioxidants, micro-nutrients and enzymes of the redox system:

Vitamin A, E, K, C carotenoids, zinc, copper, cysteine, coenzyme A, cytochrome and other small molecules weight substances. Those enzymes help to by pass blockage in the R.C. and reactive the cellular respiration.

According to Dr. Paul Seeger, one of the great innovative scientist thinkers of this past century (unfortunately he died at the age of 87 years), the inactivation of the respiratory chain, within the mitochondria, cytochrome oxidase (cytochrome a/a₃-complex IV) the terminal complex of the mitochondrial respiratory chain, and passes electrons from cytochrome C to oxygen; could be responsible for cell malignancy.



With time damaged cells create sister cells that lose their capacity to produce A.T.P. energy. They begin to age faster, thus enhancing premature aging, disease and cancer.

© Professor Serge Juretschke

Cytochrome oxidase is responsible for transferring hydrogen to the oxygen delivered by haemoglobin. The inhibition of cytochrome oxidase stops the last transfer of electrons to oxygen, therefore it completely blocks the chain. As result. hydrogen accumulates and the cells are forced to switch over to glycolysis. Accumulation of hydrogen becomes a poison for the mitochondria and must he expelled through hydrogen acceptors (propolis, red beet juice, squalene, etc. ...).

Some other degenerative diseases and Alzheimer disease is a feature of decrease of cytochrome oxidase activity. In A.D. brain patients show a 50% decrease of the cytochrome oxidase activity, meaning supposed mutation.

Paul Seeger was visionary. Since modern science demonstrates after 50 years the finding about blockage of the R.C. and mitochondria DNA mutation responsible for many degenerative diseases including cancer. Recently it has been proved that

mitochondria are susceptible to genetic defects and responsible for biological weakness and modern diseases. All these “mitochondrial” diseases, show a malfunction of the oxygen consuming enzymes, which are involved in energy production of the body.

Some research demonstrates that mitochondria DNA mutation can serve as tumor marker, such mitochondria sample taken directly from the saliva in case of lung cancer.

First, we realise that oxygen but without the vital enzymes of the “respiratory Chain” cannot burn. Hydrogen accumulates in the cancer cells forcing the cell to cover its energy demands by switching over to glycolysis. The cell respiration is the central biologic system necessary for life, survival or the recovery from disease. We can witness the same situation by the death of the forests or fishes in the rivers from accumulated blazes and poisons.

In 1920, Otto Warburg, a scientist in Germany, had invented a new device that could measure how much oxygen was actually used by a bit of living tissue, the “Warburg apparatus”. He measured the oxygen consumption of leaves, frogs, pieces of different tissues, embryos, young and old tissues and calculate their respiration rates. But Warburg measured the respiration of a tumor and found it hardly used oxygen at all (5). That respiration was somehow inhibited. After a lifetime of work Warburg finally concluded that any substance that damaged respiration would cause tumors. He had proved it many times, in many animals, with many respiratory inhibitors.

More recently, it was shown in animal experiments that poisoning of the cells’ respiration led to inhibition of oxidative

phosphorylation (oxphos) in healthy experimental animals.

This state of poisoned cell respiration results in considerable loss of respiration centers (mitochondria count) in the cells. Subsequent generations have a disturbed mitochondrial system in the cells and suffer a great loss of mitochondria, in the same way as is evident in tumor tissue.

Modern research shows that chemicals and poisons can bind to an iron atom of the cytochrome oxidase, blocking its function (6). The E.C.T. is blocked and each cell asphyxiates bathed in oxygen but unable to use it.

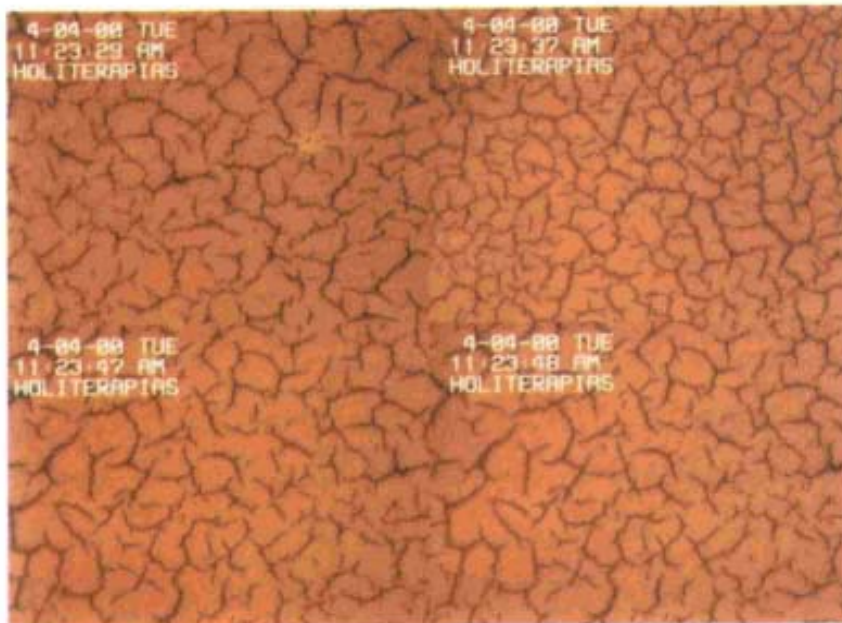
Therefore, cancer is a disease of the central biological system and could be combated successfully only if the R.C. is reactive by cell respiration, activators and hydrogen acceptors to overcome biochemical lesions. According to Paul Seeger, this process can reverse the carcinogenesis of the cells. Fermentation and the ATP energies regenerated through the redox potential can repair the broken DNA chain. Using vegetable bases activator of cell respiration and hydrogen acceptors such as flavonoids, propolis, anthocyanins and squalene, Seeger demonstrated a decline in cancer virulence by increase of cell respiration, which also activates detoxifying effects. The physical condition of a patient improves step by step through intensifying cell respiration by activating the regulation systems and the endogenous synthesis mechanism like hormones synthesis, enzymes synthesis, proteins synthesis.

Enzyme yeast cells contain the necessary enzymes and other small molecules of the redox, similar to the ones produced by the body. Therefore, they can restore the blockage of the R.C. and reverse the carcinogenesis of the cells with decline in the virulence of the tumor and as a "Whole" induce a biological

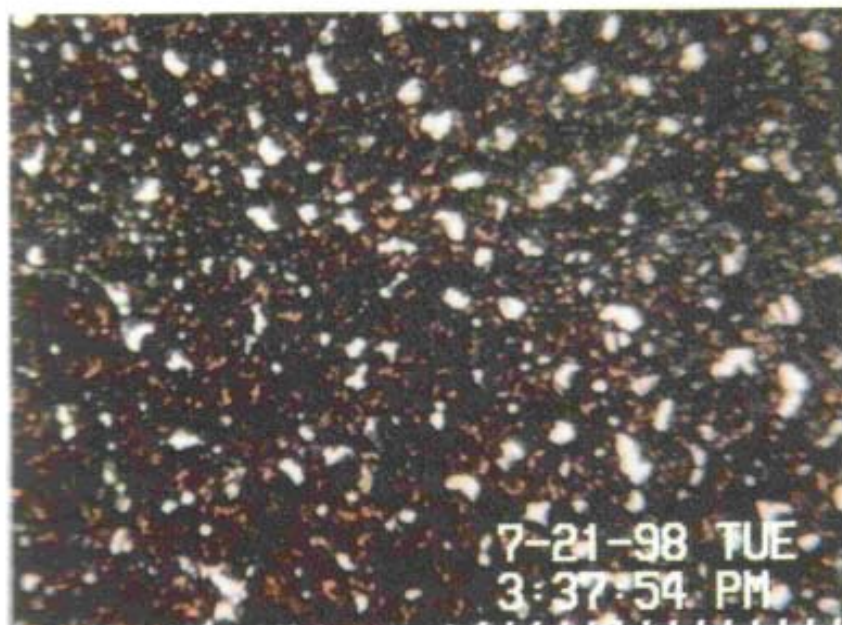
regeneration of the body. It may depend on a various factors such as the stage of the disease of how much damage has been done by chemotherapy, which may interfere with the repair of the DNA chains.

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H. L. B - blood test



Normal pattern



Physical stress (ROS masses 2 microns) 1 micro allergy

After taking the enzyme yeast cells (zell-oxygen) the level of oxidation (free radical activity) decreases, meaning optimum antioxidant therapy, diminution of inflammatory process and less damage to the cell's DNA. In some difficult cases we may have to use together some other support such as my new low molecular antioxidants (Anoxe), since the activity of free radicals is too high. But I have always decreased and stabilized high oxidation levels by using enzyme yeast cells and the compound Anoxe.

I have also proved that enzyme yeast cells taken at least one or two months (when possible) prior to surgery of breast cancer either to reduce or eliminate completely the risk of metastasis or a second tumor at a distance. In some cases I could even say that after surgery and with no metastatic condition, the intake of enzyme yeast cells make it unnecessary to give radiation therapy. Many cases suffer local relapse after radiation therapy such as in cases of colon, rectum or lymphoma.

One of my patients with lymphoma enjoy a complete remission of one large tumor localized in the bronchial area. However, the Oncologist, although very impressed, suggested 30 radiotherapies to strength the cure. Unfortunately the treatment did the opposite than expected and the tumor grew even bigger.

Cancer patients are suffering from nutritional deficiencies: therefore, they have a poor immune response. After a period of one year or more with chemotherapy and radiation they even suffer from malnutrition.

Up to 40% of all cancer patients die from malnutrition. From 20-50% of hospital patients suffer from protein caloric malnutrition with the increase in mortality and surgical failure

from a reduction in immunity and response to chemotherapy and radiation therapy. They easily develop infections treated with antibiotics, which develop more resistant bacterias, and a decreased immune resistance with additional dysfunction.

Many times, patients die from total collapse of the biological regulation system, anaemia, heart failure, respiratory disorders etc.. 40% of the cancer patients die from infections and others from some organ system failures, but not from the disease itself.

We can realize the failure of the medical system, even if we recognize some technological progress in the various area of oncology. Survival rates may be improve, but at what cost?! Nobody is focusing on the cure of the disease. All those repeated complications are only the consequence of madness to over use chemotherapy and radiation therapy in one hand, and without consideration of nutritional, immune and antioxidative support in one other hand. With the decrease and collapse of ATP energy, the body cannot properly synthesize proteins, hormones and enzymes.

The body loses its vital substances with complete failure of the regulation systems. Amino acids should be also prescribed as support of protein loss, especially when patients lose weight.

It is wrong to spend billions of dollars trying lo find new effective therapy for cancer and ignore some basic elements that could increase lifespan statistics, the quality of life, improved therapy performance, and see less relapse and more durable results.

However in many countries, such as in the USA, we assist new cancer approaches, based on the new theories of alternative medicine with thousands of cases which have recovered from

cancer, or extend lifespan.

Even the National Cancer Institute (USA) is calling for the “best” series of cases of cancer treated with complementary medicine. Some Universities, such as Columbia is now investigating those cancer cases. Medical doctors from the National Foundation of Alternative Medicine come to see me to review my best series of cancer cases in order to be presented at Columbia University.

We cannot go on 100 more years with the theory of cancer tumor localisation as the unique consequence of the disease and the only approach as T.N.M. (Tumor, nature, metastasis).

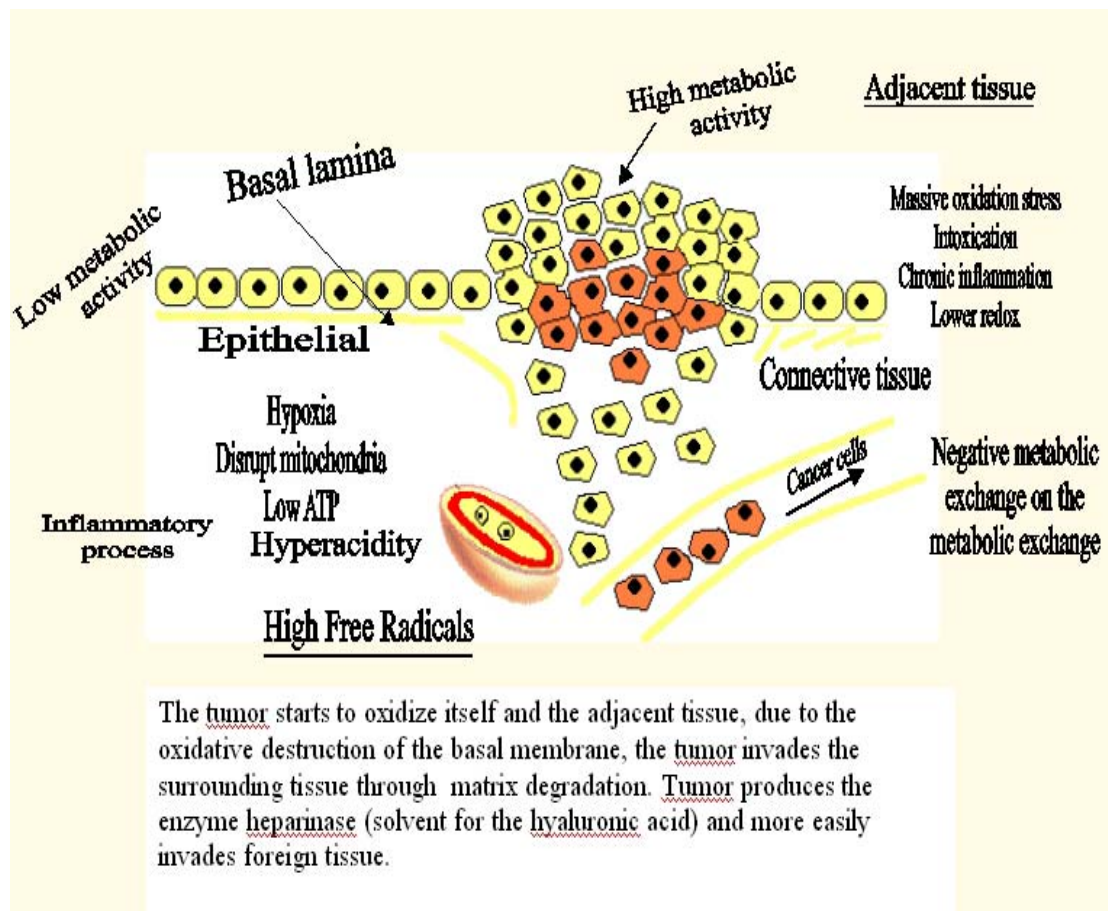
How to approach the tumor

There are now some promising avenues that prove angiogenesis is connected with the inhibition of P53 gene. Some test tube experiments (7) suggest that normal P53 function can be restored with small molecules which when attached to a mutant inactive P53 protein, would reactive it. Therefore we would expect the malignant cells to stop growing and even die. However there are other factors that need explanation and we must keep in mind that cancer is a multiple dysfunction diseases, which asks for a total-body approach.

For instance the progression of the tumor into the surrounding tissue depends not only on it's own anatomy and nature but also on adjacent cells and tissue. That may open new possibilities of therapies in complementary medicine.

According to the German researcher Fisher the peritumoral tissue (8) activity must be superior to the activity of the tumor,

otherwise the tumor grows faster. Some measurement (Todt's oxygen determination) in various tissue cells has proven that the metabolic activity in a cancer patient's peritumoral tissue is less than a tumor. On the contrary, the peritumoral tissue activity must be superior to the activity of the tumor in order to decrease the virulence and thus may become smaller and can even be reversed.



Oedema of the conjunctive tissue (see the figures) may explain tumor initiation, promotion and progression, since recently research demonstrates that tumor cells are usually unable to stimulate angiogenesis when they first arise in a healthy tissue. Dr. Wolfgang Kōstler, president of the Austrian Society of Oncology stressed that there is reason to believe that malfunction of the connective tissue could initiate the cancer and increase the tumor progression and extension.

Chronic toxicity or chronic inflammation, lower O₂, free radical activity in the connective tissue leads to a stiffer and less fluid consistency of the matrix. It has a negative influence on the metabolic exchange between blood vessels and structures of connective tissue and epithelial cells.

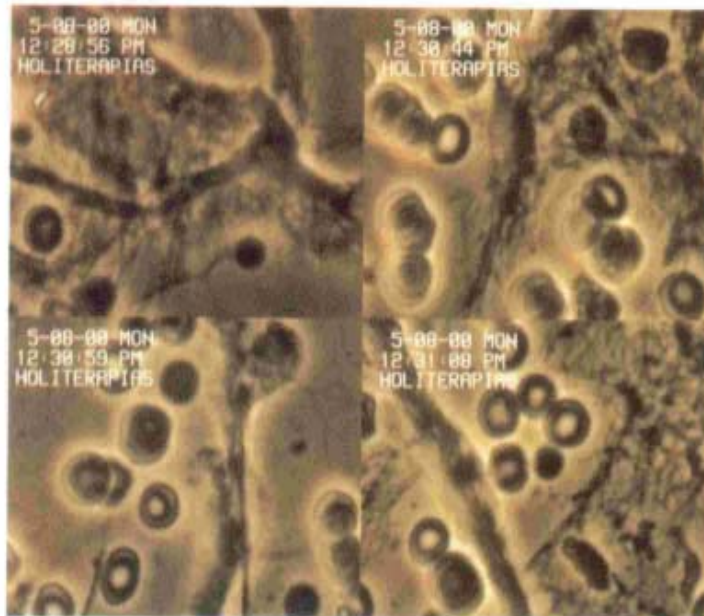
If the connective tissue becomes more jelly in consistency as in the case of low oxidative potential or hyperacidity, caused by toxic influence, bad foods, chronic or inflammatory process, oedema will develop in the matrix. The oedema of connective tissue leads to a blockage of nearly all the exchange procedure in the matrix between nutrition and detoxification, detoxifying vessels and epithelial cells. Therefore, oedema of connective tissue leads to alteration of metabolism of epithelial cells on the way to gain a stepwise cancerous attitude.

Oedema of connective tissue leads to a decreased oxygen transport from blood vessels to the epithelial cells, which causes hypoxia and chronic hypoxia, which increase proangiogenic factors to favour the formation of blood vessels by the tumor. On the other hand, chronic hypoxia of epithelial cells and the jelly consistency of connective tissue lead to a chronic deficiency of oxygen in the mitochondria, which increase free radicals, caused by overproduction of electrons in the respiratory chain.

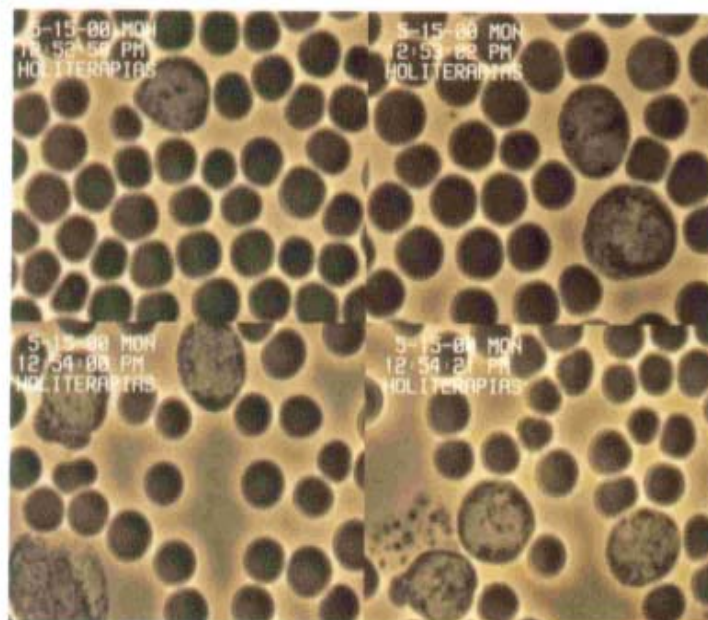
In this situation, the tumor starts to break up and invades the surrounding tissue through matrix degradation.

The tumor produces an enzyme called heparinase, which is a solvent for hyaluronic acid, an important building stone of the connective tissue, and easily, thereby invasion of foreign tissue. Metastasis potential correlates with enzymatic degradation of basement membrane collagen (Nature-284.67.68. 1980).

Multiple myeloma



The men was feeling very weak after a strong chemotherapy. The blood assessment show on the first photo high lipid peroxides level (from chemo) and red blood cells agglutination.



After seven days only using one ampoule of zanzella daily, additional 60 ml of enzyme yeast cells daily, some low molecular antioxidants to strength the treatment. We can observe with the 2nd photo a 100% modification with increasing and very good shaped red blood cells and active white blood cells.

The membrane surface on most of the aberrant forms have a rough granular appearance focally all over. The membranes of these deformatted red cells were rigid and have difficulty to squeeze when entering blood vessels. The blood circulates through very small capillaries, which are about 3 microns in diameter compared to 6-8 micron diameters of the red blood cell. The biconcave shape of the red blood cells become very important for it is this shape and the normal elastic properties of the red blood cells and its cytoskeleton, which permits the squeezing of the red blood cell through the small diameter of the capillaries. This is the way that oxygen and nutrients are supplied to the remotest parts of our body.

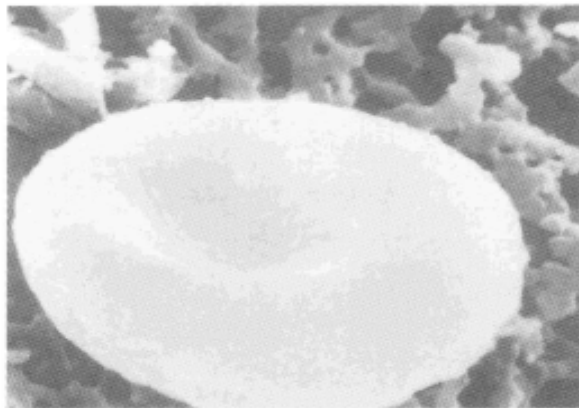
In such situations red blood cells slow down their speed by entering with difficulty into the thin capillaries, pushing the membrane of the capillaries in order to move on. Therefore they slow down the circulation and oxygen supply to the body. In the same time they damage the membrane of capillaries which lose proteins, that enter in blood circulation and accumulate in the cellular milieu causing asphyxiation of the cells.

We can understand that if this microcirculation is disrupted, the cells of the brain, neurons or muscles suddenly suffer from a lack of fresh oxygen and lack of chemical exchange of most products leading on to localized lactic acidosis.

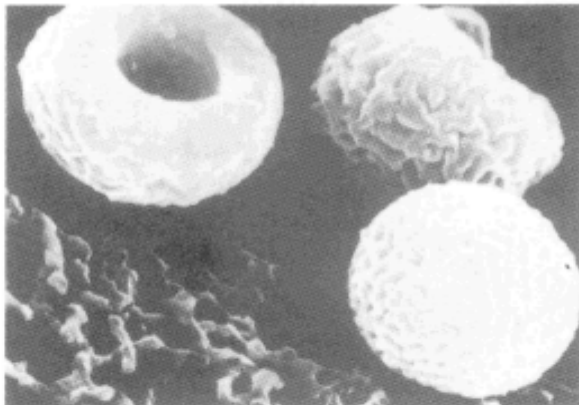
There is reason to believe that if such microcirculatory defects occur and affect a group of neurons or nerve cells, we may get what we call neurogenic symptoms. On the other hand if it affects a group of muscle cells we get muscle fatigue or pains.

Until I read the work of Dr. Mukherjee (17) about the rigidity of red blood cells I observed in my microscope abnormal

structure of red blood cells, lack of elasticity and some rigidity. That situation is visible not only in diseases such as cancer but also when there is some mitochondria dysfunction and blockage of the R.C. Several studies concerning candida invasion explain that fungi release chemical substances which produce rigidity to the membrane of white blood cells and red blood cells. It is when I read this information that I came to the same conclusion.



Erythrocyte (red blood cell) with normal morphology



Deformed erythrocytes found in relapsing CFS patients

Environmental chemicals can also damage any cell's structure since they are fat soluble. Xenobiotics can by the same way damage lymphocytes or even the inner membrane of the

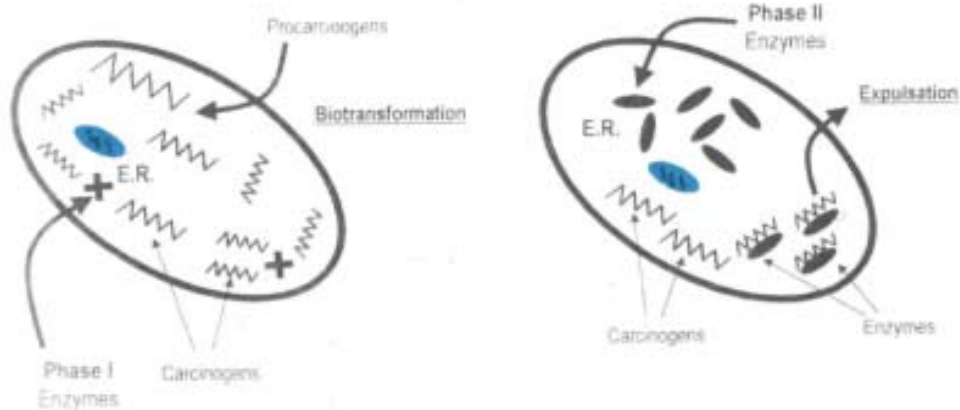
mitochondria just where the R.C. is located and block the chain. The majority of C.F.S. patients had been exposed or were exposed to environmental chemicals or pollution. Increasing pollution in large cities and exposure to an excess of insecticides and pesticides is a feature of increasing level of C.F.S. in our modern society. Never before have people lived in such a toxic environment.

In Australia Dr. Robert Buist discovered indirect evidence for an association between chemicals and C.F.S. A group of doctors in Sydney who have routinely analysed the blood of 300 CFS patients for chemicals during a 12 month period. The test revealed elevated blood levels of many chemicals including DDT, DDE, dieldrin, xylenes, styrene, tetrachlorethylene, isomers of PCB's, etc... No Wonder CFS symptoms are frequently exacerbated at such times and may indeed result from the consequences of destructive free-radical-induced membrane changes affecting mitochondria, erythrocytes and lymphocytes.

It may even damage enzymes responsible for xenobiotics detoxification.

Xenobiotics can damage the P450 cytochrome, lower the redox, and disturbed Phase I, detoxification, which in turn produces more free radicals.

However what I learned from medical research and associate to my clinical practice is that chemical damage may affect mitochondrial membranes and associated respiratory DNA enzymes.



Most cancer-causing chemicals enter the body as procarcinogens. Phase I enzymes produced in the liver are broken them. Phase II enzymes expel the dangerous residue of Phase I transformation which can be harmful if Phase II is too slow. Enzymes and a family of antioxidants found in cruciferous vegetables boost the production of Phase II enzymes.

These changes are most likely only found in some of the muscles fibres causing pains and difficulty to move. Some of the cases of CFS I have under my care include young women in wheelchairs and even a 12-year- old-girl with muscle pains and considerable difficulty to walk It took me several months before the young woman could leave the wheelchair and start to walk on her own. And it took one extra year before she felt healthy.

In those particular cases I preferably to use zanuzella (sport), which is a biological--energy-activator containing extra enzymes, and high coenzyme Q10.

We may have to detoxify the blood, kill the candida invasion and other bacterial forms such mycoplasmas of CFS candidates. I explain in this document that *Sacchromyces cerevisiae* (the zell-oxygen strain of yeast) has an antagonistic effect against candida albicans.

My clinical experience with C.F.S. includes the famous organic germanium that accelerates the transfer of electrons in the R.C., increases oxygen to mitochondria - since the oxygen molecules of germanium are about 2 microns, capillaries are 3 microns - Organic germanium deliver easily oxygen, or substitute when red cells are unable to squeeze. Organic germanium has also antimicrobial and antiviral activity. Depending on the case and the age, I would recommend giving between 200 mg - 400mg per day during a 3-4 months experimentation.

Once, I received a letter from a South African medical doctor living in Johannesburg, he was suffering from C.F.S. and after investigating other medicines, he discovered that natural products, vitamins and enzymes could be very useful to him. This man was unable to drive his car out of Johannesburg; driving 40miles was too much for him. Since he discovered my work on germanium and the results obtained, he asked me to advice him on the matter.

Therefore I suggested the following treatment:

- 1 — 3 x 20 ml — ampoule zanzuzella per day;
- 2 — 300 mg of organic germanium per day;
- 3 — 3 tablets of Cal-Mag-Zinc per day to decrease acidity in tissue.

Together with an alkaline/acid balanced diet, green potassium juice, steamed vegetables, fish, no meat for 3 months, sesame puree, barley, but not wheat cereals or bread.

With C.F.S. patients, it may take some time before they improve but we surely can reverse the situation as I did with the South African doctor. After a couple of months taking this therapy he was at least able to drive his car out of Johannesburg.

Enzyme yeast cells and the Intestine

For 34 years I have looked at the intestine and colon as the main organs of our biological equilibrium and to be restored during chronic or degenerative disease. The integrity of the intestine Which helps to strengthen the immune system needs great care, specially when the membrane is abused by industrial foods. The micro flora are destroyed by excessive of antibiotics, or even during chemotherapy treatment which damages the tunica membrane.

When I came back to Europe around 1969 I went to Germany to see what I could find in order to detoxify the body. More precisely it wanted to detoxify the colon, and restore the intestinal flora to increase health status, promote immune resistance, and eliminate the eventual disease.

I leaned about nutrition, the integrity of the intestine, the micro flora, and about the Arc-reflex-disease coming from the GUT, with the late world famous Dr. Bernard Jensen of Escondido, California.

However, only in Germany I found out that the human-intestinal system has its own immune system located in the lymphatic tissues of the intestinal mucous membranes. No wonder the intestinal flora of cancer patients is always damaged by wrong foods, pharmaceutical drugs and antibiotics in excess.

While in Germany participating in a congress of natural medicine, I was acquainted with the work of the Dr. Otto Warburg (who died shortly after my trip) and the preparation called Zell-oxygen developed by Dr. S. Wolz.

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CONCLUSION

Enzyme yeast cells initiate a quick and immediate revitalisation process because the physical functions, regulation growth system and biological disorders are regulated.

- A. Total biological detoxification.
- B. Biological regeneration of the mucous intestinal flora and GUT system.
- C. Elimination of chronic latent inflammation through stimulation of the proteolytic enzymatic process.
- D. Support the body's own antioxidant defence. Detoxification and regeneration of the skin.
- E. Improvement of the colon elimination.
- F. Partial or total elimination of intestinal symptoms.
- G. Stimulation of the blood.
- H. Improvement of oxygen supply and the respiratory tract.
- I Stimulation of the immune system.
- J. Reduce bad cholesterol level.
- K. Increase the energy level.

Enzyme yeast cells have shown positive effect in the treatment of intestinal disorders including intestinal bowel syndrome. The antioxidant property of the enzyme yeast cells reduces the high activity of free radicals in the intestine and lipid peroxidation, therefore reducing inflammatory process with improvement of the condition.

Modifications of the red blood cell's morphology.

- normal morphology of red blood cells. (size and shape)
- elimination of lipid strands.
- less dying wbc's.
- elimination or diminution of bacterial/fungal invasion.
- elimination of necrotic tissue, toxins, mucous, etc....

Therefore it shows a decrease in oxidative stress and increasing nutritional support.

Stimulation of the circulation, meaning more oxygen available to cell's need.

Meaning also more nutrients, more antioxidants, less cellular damage, and repair. The body can start protein synthesis again.

Generally speaking yeast cells are activating a strong detoxification process in the body, mainly at the liver P450 system and activate a quick biological regeneration.

- Better Health Status -

Increasing physical and brain performance.

Best results obtained with enzyme yeast cells.

Organic deregulation.

- Gastro-intestinal disorder
- Allergies
- Fatigue
- Circulatory disorder
- Hormonal dysfunction
- Nervous dysfunction
- Cholesterol

Indicated in the following diseases:

Cardio-vascular diseases.

Diabetics.

Malignancy.

Rheumatism.

Alzheimer disease.

Atherosclerosis.

Parkinson disease

To prevent aging process

Live yeast cells (zell oxygen)

Nutrition supplementation is the most complete natural, organic foods.

POSOLOGY:

PREVENTION: 1 tablespoon mixed in one large glass of fresh organic vegetables or fruit juice between the meals, or in water after each meal.

TREATMENT: Aging symptoms, tumors, C.F.S., etc.

15-20ml mixed in one large glass of fresh organic carrots and beet juice. Add one tablespoon of liquid chlorophyll. 3-4 times per day. (increase by 1200 folds the cellular respiration)

FOR MORE STRENGTH: Zell oxygen + royal jelly + enzymes

1 vial before the breakfast and in case of extreme weakness 2 vials per day.

Zell Oxygen does not contain synthetic chemical stabilisers, colours, pesticides or flavour substances.

Vitamin analysis of each 100ml of Zell Oxygen:

Thiamine: 4.45mg
Riboflavine: 1.8mg
Pyrodoxine: 1.85mg
Inositol: 88mg
Cobalamin: 0.27mg
Ascorbic acid: 108mg
Tocopherol: 42mg
Carotinoid: 5.16mg
Nicotinamide: 11.4mg
Biotin: 22mh
Para-amino benzoic acid: 1.94mg
Choline: 77.6mg
Pantothenic acid: 8.47mg

Active organic elements and minerals in each 100ml of zell oxygen:

Sodium: 476mg
Calcium: 12mg
Phosphate: 631mg
Magnesium: 88mg
Sulphate: 6.8mg
Chloride: 4.5mg
Silicates: 17.7mg
Iron: 1.57mg
Copper: 440mcg
Aluminium: 1.1mg
Chromium: 0.008mg

Zinc: 2.8mg

Selenium: 0.59mg

Manganese: 2mcg

Cobalt: 374mcg

Amino acids in each 100ml of zell oxygen:

Gluthatione: 10mg

Qualitative analysis:

Asparaginic acid

Leucine

Isoleucine

Histidine

Artginine

Phenylalanine

Cysteine

Glutamic acid

Serine

Tyrosine

Glycine

Valine

Proline

Methionine

Choline

Enzymes:

a) Hydrolases

- Estearase

- Carbohydrase

- Protease

- Nuclease

- Glioaxilase

b) Transferases

- Transphosphorylase
- Transaminase
- Transacetylase
- Transglucosidase

c) Oxidases

- Desmolase
- Dehydrogenase
- Decarboxylase
- Aldolase

d) Auxiliary enzymes

- Phosphorylase
- Hydrolase
- Ammoniase

Salmonella: Zero