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At the Orlando A4M Congress, April 7, 2011, Dr. Kugler presented: **“The Scientific basis for defining “true life-long health” as a state of homeostasis, with Aging and Telomere Research confirming Health Practices as true Anti-Aging Modalities.”**

Find a 3-page abstract in the HEALTH/MEDICINE Folder.

Audio CD (63 slides) of Dr. Kugler’s 40-minute presentation is available at: <http://www.prolibraries.com/a4m>

At the December 2009 meeting in Las Vegas, Dr. Kugler presented:

ALTERNATIVE THERAPIES IN THE TREATMENT OF CARDIAC INJURY; A CASE REPORT WITH RECOVERY REGIMENS FOR NON-ABLATABLE ATRIAL FIBRILLATION AND GREATLY ENLARGED LEFT ATRIUM

*Hans J. Kugler, PhD (patient), with Ulrich Friedrichson, MD, PhD,
Fouad Ghaly, MD, and Paul Ward, PED.*

(Reproduced here are only 3 key sections. The full paper will be published in Medical Therapeutics; a book containing selected papers from the proceedings of the 17th Congress of A4M, Las Vegas, 12.12.09)

CD of talk available at: <http://www.instatapes.com/A4M/toc.htm>

Disc 3, talk No. 2.

Abstracted version:

INTRODUCTION

Patient: 68-year-old Caucasian male, impact-induced (2 severe car accidents) atrial fibrillation (non-reversible; shock, chemical, ablation), left atrium 6.8 (<4.0 is normal), ejection fraction 28% (>50% is normal), 4/6 heart murmur. Besides “three drugs and a pacemaker/defibrillator,” mainstream medicine has no treatment protocol for such a patient, and absolutely none for a full recovery. Using the multifactorial approach (MFA) – combining key essential requirements for optimum health, with an emphasis on rebuilding the muscles of the heart and the revascularization of regenerated heart muscles –, we achieved a full recovery. Heart rhythm has been 100% sinus for 3 years now, ejection fraction 80%, left atrium 3.7 (normal again), and 1/6 heart murmur. The key alternative modalities that were combined included: resistance exercise (weight-lifting), organ-specific embryonic cell extracts (heart, mesenchyme, and muscle), EECF (enhanced external counter pulsation), small amounts of human growth hormone (HGH), meditation, breathing techniques, and a number of nutrients that are heart-specific and anti-inflammatory.

Addendum: 62-year-old male patient, extremely poor state of health (bronchitis, poor skin color, congestive heart failure, coronary artery disease, heart irregularities uncontrollable with pacemaker, ejection fraction 18%, on priority list for heart transplant) followed the same recovery protocol in two 4-months segments. He is now off the heart transplant list, his ejection fraction has nearly tripled, his pacemaker now effective, and he is “in good health with lots of smiles” back working on his farm, lifting bails of hay for weight-training exercises.

Recovery Protocol: The Major Modalities and Reasons for Employing and Combining Them

Cardioversion to restore sinus rhythm (and keep the heart in sinus rhythm) was the critical first stage of treatment. Once this was achieved the patient began the recovery program, this included:

- Cell extracts: A refinement of Dr. Niehans Zelltherapie injectable, (5 ml, i.m.), organ-specific extracts (contain low molecular weight peptides, nucleic acids, and growth factors) from embryonic sheep and porcine tissues, combined with oral cell extracts that are available in the US.¹² Injectable mesenchyme has been shown to increase healing,¹³ and heart extract has been shown to strengthen the heart and heart rhythms.¹⁴ Ulrich Friedrichson, MD, PhD reported that muscle extract has been shown effective in the recovery of muscle injuries, and in training and muscle development in athletes (personal communication, November 9, 2005).

- Super circuit weight training: Weight training has been shown to increase heart muscle in general, and build atrium walls specifically.¹⁵⁻¹⁸ The weight-training exercise program used was designed by Dr. Paul Ward, PED, Olympic trainer.¹⁵
- EECP (enhanced external counter pulsation): Left atrium muscle needs to be revascularized if there is any hope of rebuilding it. EECP, besides greatly improving heart functions, has been shown to revascularize heart muscle.^{19,20}
- Niacin-based detox: Since rebuilding heart muscle is vital for recovery, estrogen effects and immune suppression, caused by exposure to BPA (bis-phenol-A) and other organic pollutant exposure from plastics was unacceptable. A niacin-based detox program (1_ g of non-flushing niacin taken one hour before inducing sweating) was therefore practiced 2 to 3 times per week.
- Human growth hormone (HGH): 6 mg/month of HGH was used to support for the above modalities.
- Meditation and optimum breathing techniques: There are numerous references in the scientific literature that show a connection with breathing and heart functions.^{18,21}
- Nutrition and nutritional supplements: A quality diet – with an emphasis on avoiding trans fats, high-fructose corn syrup, and chemical pollutants – was supported with blueberries, strawberries, and pomegranate juice/concentrate. A basic supplementation program as recommended by Dr. Melvyn Werbach, MD: consisting of B-complex, multi-minerals, antioxidants,²²⁻²⁴ and extra niacin.²⁵⁻²⁷ In addition:
 - Fish oil: Biochemistry of lipid metabolism and anti-inflammatory action show a high priority for fish oil, later supported with data that showed a reduction of arrhythmias with fish oil.²⁸⁻³⁰
 - Acetyl carnitine: Increases the activity of cytochrome oxidase in the heart, and is thus important for mitochondrial energy metabolism.³¹⁻³³
 - Alpha lipoic acid: Important for mitochondrial – high energy output – cell functioning.^{34,35}
 - L-Arginine: Metabolized to nitric oxide, a key factor in blood pressure regulation and exercise metabolism.³⁶⁻³⁸
 - Turmeric: The curcumin in turmeric has a demonstrated anti-inflammatory effect, and has been shown to benefit the heart.^{39,40}
 - Vitamin D: Vitamin D deficiency, especially in the light of new (higher) vitamin D requirements, is a risk factor for heart health.⁴¹⁻⁴³
 - Coenzyme Q10: Protection from oxidative stress, and more, makes Co-Q-10 a key factor in metabolic therapy for heart disease.⁴⁴⁻⁴⁶
 - Trimethylglycine (TMG): Decreases plasma homocysteine concentrations, increases oxygenation of tissues, and has a corrective effect on the nicotinamide coenzyme and adenine nucleotide content of the tissues.⁴⁷⁻⁴⁹

There were two stages to the recovery program – an initial 3-months regimen, followed by a 5-months regimen.

Results after 3-months:

Heart rhythm was 100% sinus during the entire 3-month period. Heart murmur had decreased to 1-2 by the end of the 3-month period. Echocardiogram confirmed recovery success: ejection fraction 60% (up from 28%), left atrium 5.8 (down from 6.8, normal is <4.0), and all other variables in normal range. Patient felt extremely good; exercise capacity is back to near pre-accident level, including jogging, weight-lifting, and horseback riding.

Results after 5 more months:

Echocardiogram after the 5-months recovery protocol showed further improvements: ejection fraction 80%, left atrium further improved to 3.7 (now in normal range), and all other variables within normal ranges. Routine examinations, besides confirming the excellent state of health, also recorded a further decrease in the heart murmur to 1-2/6. Patient felt very good, and was maintaining a strong health and fitness approach. Patient had lost 18 lbs of lean body mass in the time following the 2003 accident. However, by following the super-circuit weight training, as developed by Dr. Paul Ward,¹⁴ he had managed to regain 12 lbs of lean body mass by December 07. ECG, blood analysis, and regular examinations have shown him to be fully recovered and in excellent health (also passed two aviation medical examinations).

Hans J. Kugler, PhD (patient), Ulrich Friedrichson, MD, PhD, Fouad Ghaly, MD, and Paul Ward, PED.

Re.: The Multi-Factorial Approach to Cancer (MFAC).

By **Hans J. Kugler, PhD**

Background: My key interest, mainly research, is in the field of anti-aging; at Roosevelt University in Chicago I did longevity studies with cancer-prone animals (mostly mice). The results of these longevity studies led to several books on aging, scientific publications, and presentations at anti-aging medical meetings. A heavy emphasis in aging research is on the immune system; prof. Roy Walford's (UCLA) Immunologic Theory on Aging is a corner-stone in this field. Working with doctors in alternative and anti-aging medicine, I was asked for suggestions for stimulating immune functions in cancer patients who had chosen not to undergo the standard chemotherapy/radiation treatments. A number of patients - stubborn, determined, ready to fight the disease - did extremely well on our approach; abbreviated case histories can be found at www.gvi.com/gviweb/iaam/cancer.html. We make no claim for our approach (essentially stimulating immune functions) as a treatment for cancer. However, it is a generally

accepted fact that a well functioning immune system is a key factor in overcoming cancer.

MFAC incorporates the following:

a) Eliminate all major cancer risk factors (smoking, too much, or too little fat in the diet, high stress levels, environmental pollution, etc.) from a patient's life. This includes, **as a major part of MFAC, a niacin-based detox program. Adipose tissue analysis (incl. Nerve tissue) has shown that from 50 to 100 toxic chemicals can accumulate in this tissue, greatly suppressing immune functions. The niacin-based detox (taking up to 1,500 mg of niacin/non-flushing niacin about 1 _ hours before inducing sweating via exercise and/or sauna, at least three times per week) can remove about 66% of the toxic chemicals from the body in about 4 to 6 weeks.**

b) Incorporate key nutrients that have been found important for cancer prevention in quantities ranging from slightly above RDA to mega-amounts (emphasis on antioxidants, glutathione, selenium).

c) Use of cytokine-enhancing natural substances (phycotene, DMG, IP-6, beta-glucan, special herbs, mitake mushroom extracts, etc.) to enhance immune functions. **Phycotene** (activates Tumor Necrosis Factor by close to 500%). **DMG, or TMG (di- or trimethylglycine)** activates alpha-interferon production by more than 500%). There is synergism between TNF and alpha-interferon, enhancing the overall immune stimulation even more.

d) **Thymic Protein-A:** The thymus gland, located just behind the breastbone, is the organ where B-cells (produced in the bone marrow) are converted into cells (T-cells, killer cells) that can actually attack and kill cancer cells. As we get older, the Thymus shrinks, thus decreasing key functions of the thymus. Thymic Protein-A is the "training sergeant" that converts B-cells (made in the bone marrow) into "marines" in the thymus. Researchers identified the gene that codes for Thymic protein-A, cloned it, and inserted it into beef thymus cells. These cells, in the laboratory, kick out Thymic protein-A; it is then isolated, purified, and is available in small envelopes in the form of a sublingual powder. **References:** a) Beardsley, T, Induction of T-cell maturation by a cloned line of thymic epithelium, Proceedings Natl. Acad. Sciences, 1983;80:6005-9. b) Klabin Marketing of New York (800-933-9440, or 212-877-3632) has put together an excellent information package about Thymic Protein-A.

e) **Enzymes:** In a large-scale study, sponsored by Wobenzym (Germany), the - highly effective - use of enzymes on cancer-survival rates was demonstrated. Doctors from four European countries participated. 12,000 cancer patients (all kinds of treatable cancers) that had undergone standard cancer treatments were, after completion of treatments, divided into two groups; patients were paired by age, sex, type of cancer, etc. Group 1 followed standard advice, Group 2, in addition to standard advice, was given enzymes (6 to 8 tablets at least twice per day) on an empty stomach. "Empty stomach" is defined as _ hour before, or 2 _ hours after food intake. **Results: Group 1 had an average survival**

time of 5 years, while group 2 (the ones that took enzymes) had an average survival rate of about 11 _ years.

f) Embryonic (organo-therapeutic) Cell Extracts.

In 2002 I was invited to present my ideas and theory regarding anti-aging to the European Anti-Aging Conference in Baden-Baden, Germany; it was there that I learned about embryonic cells extracts. For more than 50 years European doctors had practiced a rejuvenation/treatment method, originally developed by Paul Niehans, MD, known as "Cell Therapy," that used injections of organ-specific cells from embryonic sheep tissues; that means cells from the heart strengthen the heart of the treated person, cells from the liver revitalize liver functions, and embryonic thymus and mesenchyme cell injections were used to activate immune functions to treat cancer. From movie stars to statesmen, and even the pope, were treated with these embryonic cell tissues. Dramatic results - published in a book by prof. Franz Schmid, MD - were achieved at the children's hospital in Aschaffenburg in treating Down's Syndrome children; IQ doubled, and growth and skull parameters were much closer to normal parameters. Famous German and Swiss rejuvenation clinics used special cell combinations for rejuvenation and anti-aging. Then, during a 6-year University project at several medical schools, scientists identified special peptides and nucleic acid fractions - generally referred to as "growth factors" - as the active ingredients in those embryonic cells. Starting about 7 years ago, doctors that had been involved in this research have been using **injections of these embryonic (organo-therapeutic) cell extracts to treat various diseases.**

Over the past years, myself and other doctors, have been referring patients to Dr. Ulrich Friedrichson in Germany. **These embryonic cell extracts are often used in combination with any of the MFAC factors.** We have seen dramatic results: lung cancer disappeared within two months in a male patient, age 48, a 52-year old female with bone marrow cancer is alive and happy 2 1/2 years after diagnosis of the bone marrow cancer, a 67-year old heart patient is back on a strong exercise program with normal heart functions, and a 72-year old male who lost his driving privileges due to macula degeneration regenerated his eyesight and got his driver's license back.

In terms of immune-enhancement and organ-specificity, I would rank these embryonic cell extracts as # 1 among all presently available methods. These embryonic cell extract treatments are under the supervision of the German Medical Board; depending on the evaluation by this board, a risk factor is assigned to a new treatment. Depending on the assigned risk factor, the doctor has to carry insurance. For embryonic cell extracts, the risk factor is zero, essentially non-toxic with no side-effects.

Since embryonic (organo-therapeutic) cell extracts are such an outstanding and impressive new treatment modality, the Academy has asked Dr. Friedrichson to give us more detailed information; you will find his "Information about organo-therapeutic cell extracts" in this - Part XI - below.

What are Embryonic Cell Extracts?

Background:

About 60 years ago, in Germany, Dr. Paul Nihans developed a treatment called "Zell Therapie." This treatment used injections of organ-specific cells from sheep embryos. According to Paracelsus, heart heals heart, liver heals liver, thymus activates the thymus hormone Thymidine, etc. Using these embryonic cells, there was absolutely no rejection mechanism in the recipients.

From famous movie stars to politicians, even the pope, were treated with these rejuvenating cell injections. A scientific journal, the **Cytobiological Revue**, documented the science and treatment regimens. **The most scientifically acknowledged treatment, still used in Germany, is for Down's Syndrome children; skull development parameters were greatly improved, facial features were much more like normal children, and IQ doubled (Prof. Franz Schmid, MD, Childrens Hospital, Aschaffenburg, Germany).**

Then, when a small group of doctors used the cell injections in an irresponsible manner, the drug industry launched a campaign against cell therapy, and only a few doctors and clinics kept practicing this rejuvenation method.

A science project:

About 12 years ago, German doctors reviewed the science of cell therapy and came to the conclusion that it definitely worked, and decided to find out which specific compounds in these embryonic cells were the active ingredients. After about 6 years of research, they found the mechanism of action:

In each specific cell (thymus, liver, brain, etc.) genes coded for cell-specific peptides. These peptides, often referred to as "Growth Factors," trigger key reactions and make things work. Mesenchyme is the most basic, everything-generating tissue; somewhat equivalent to stem cells. Specific peptides in embryonic thymus tissue activate thymus functions, peptides isolated from heart cells regenerate heart functions, brain functions are activated by cells isolated from brain tissue, etxc. etc.

These peptides (including some nucleic acids, RNA and DNA, and fractions from the mitochondria), come in (frozen) 5-ml ampules, and are injected into the muscle.

A more detailed summary - mechanisms, safety, special treatments - can be found in the attached 5-page summary by Dr. Ulrich Friedrichson, MD, PhD.

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Information about Organotherapeutic Cell Extracts

With the deciphering of the DNA-code we are a gigantic step closer to effectively treating (truly healing) diseases; we now have a much better understanding of the mechanisms of cell- and organ-functioning.

The key steps in a healthy organ-system, for overall control of the organ-system, are very basic and simple:

- a) A segment in the DNA is called a gene.**
- b) The gene codes for a peptide.**
- c) The peptide travels to a site in the body where it triggers the correct reaction for normal organ-functioning.**
- d) For every organ-system there are several specific peptides; different gene, different peptide.**
- e) The peptides for man and closely related animals (sheep, pig) are very much the same.**
- f) These processes are the most perfect and potent in embryonic and very young cells. As we get older, these processes slow down more and more and even get confused; peptides in an old body are not synthesized correctly, and the correct reactions are not triggered. The result of something seriously going wrong in a “chain of command” is a disease.**
- g) To treat the disease, cell extracts from specific embryonic animal tissues (highly active peptides) are prepared with high-tech methods (as described below) and used as injections. Example: The liver-peptide from embryonic sheep cells will stimulate the corresponding liver functions in a human. Thymus cell extracts stimulate thymus functioning, etc.**

For regimens for specific diseases, see “Cell Extracts for Various Disorders,” at the end of this discussion.

According to German medical production regulations and privileges
- § 13 I 3 AMG – we produce the different organotherapeutic cellextracts in a special GMP-laboratory.

The production as well as the laboratory are regularly controlled by the public health authorities. We have the right and privilege to produce the organoextracts under the § 67 AMG (German Medicine Production Act).

The cellextracts are produced for our patients by ourselves.

To guarantee the highest quality and standards well documented protocols are used according to the most sophisticated and modern laboratory techniques.



All steps in the production process are accompanied by multiple inspections and tests by independent laboratories. This starts out by controlling the selection of the suitable donor organs up to the finished cellextract and growthfactor peptides.

By this procedure we can guarantee a highest level of security and quality for the patients.

The legal requirements and recommended guidelines are strictly followed during the whole manufacturing process. The selected organ donors are exclusively from acknowledged breeding facilities which are tightly controlled by the public health authorities and ourselves.

The organs and cells which are extracted and removed are kept in -112 F under quarantine until the serological controls in acknowledged health institutions are finished and are rated as safe – according to the German zoonosen act 8/15/91 -.

The extraction and production of the cellextracts and growthfactors is done step by step.



After the partition of the cells by centrifugation and ultracentrifugation the high molecular proteins are separated by cross-filtration. The following virus filtration is an additional security measurement against retroviruses.



The steril filtration is done in the clean class area A/B in the GMP-Lab.



The cell-peptides are then fully automatically filled in 5 ml vials. After this procedure the extracts are shock frozen in liquid nitrogen at a temperature of minus 350.8 F. The storage temperature thereafter is minus 122 F.



The active components are among others standardized by means of HPLC.
Other components are just sodium chlorid, potassium chlorid and steril water.

No preservatives or other chemicals are added.



The end controll is done on sterility and absence of pyrogenes and endotoxins according to European medicine regulations.

The extracts are then kept frozen just until the injection to patient.

Cell Extracts for various disorders:

Heart peptides (extracts) heal heart. Liver peptides (extracts) heal liver.

THAT'S THE BASIC PRINCIPLE.

Because the majority of disorders are connected via more than one organ-system, cell extracts from supporting organs are also used:

To enhance immune functions: thymus, mesenchym (possibly also bone-marrow, liver, spleen).

Parkinson's: bone marrow, spinal cord, arterial Gr., brain.

Macula degeneration: brain, thymus, mesenchym, eye extract.

There is a cell extract regimen for literally every disease.

How do the organotherapeutic cell extracts connect to stem cells?

If patient-specific stem cells were available, one could inject the stem cells into the organ-systems that are malfunctioning (causing a disease), and the stem cells would become (embryonically active – high performance) cells of the same type. Example: Stem cells injected into the brain would become brain cells, stem cells injected into the eye become (sight-regenerating) eye cells, stem cells injected into the liver become liver cells, etc. etc. The cells in the regenerated organs would code (and cause to be made) perfect peptides. **Until stem cell therapy will be available, the organotherapeutic cell extracts are the next best thing; they are extremely safe and highly effective.**

For more details, check out “Therapeutic cloning,” “Nuclear Transfer,” “Telomeres,” “Telomerase,” etc. at www.antiagingforme.com or or elsewhere.

The Scientific Basis for Developing a Personal Anti-Aging Program

Hans J. Kugler, Ph.D.

Associate professor of chemistry, ret.

Member, Health Integration Center, Torrance, CA.

Let's jump right into the anti-aging, gerontology, and longevity studies that we did at Roosevelt University in Chicago. These led to the development of an anti-aging checklist, which you can actually alter as you wish and apply to your patients. It ranges from the most basic evaluations of the essential health practices to developing an aggressive supplementation program for a healthier, longer life, including immune cytokine activation, special substances like GH-3 and Eldepryl, and growth hormones and age-related alternative medicines. It leads to an anti-aging program that may cost you up to \$1,000 per month. You can find more details, including mini-checklists, in my book *Tripping the Clock*.¹

In our quest to find out what causes aging, why there are such differences between the young and the old, and why there are such tremendous differences in appearance between people of the same age but who grew up in a totally different environments, we look at the theories of aging that survived scientific scrutiny. Once upon a time, there were more than 15 theories on aging; most of them have died of old age.

There are essentially three theories on aging:

- a. The free radical theory by Professor Denham Harman.
- b. The immunologic theory of aging by UCLA Professor Roy Walford. Quite a few people think of the immune system as "on or off," or "good or bad," and have very little understanding of the complexity of immune functions, so we'll discuss it in some detail and from several aspects. There is so much material in this area; it is absolutely fantastic. If you have a good understanding of the sciences in general, and of biochemistry specifically, I refer you to one of the best textbooks ever written about the subject, namely *Cellular and Molecular Immunology*, by A. Abbas, A. Lichtman and J. Pober (W.B. Saunders Company).
- c. The limited cell division theory on aging by Berkeley Professor Leonard Hayflick. We'll discuss this theory later, when we take a look at the future of aging research, including cloning, gene therapy and nuclear transfer. You are most likely aware of the fact that the sound barrier of aging was recently broken when human cells were made immortal in the laboratory, without becoming cancerous, and without having DNA

damage. The most earthshaking, mind-boggling discoveries recently made in these fields clearly show that that's where the future of aging research is.

Once we have established theories of aging supported by convincing scientific data, we go to longevity studies with animals to study multi-factorial approaches combining several variables.

The animal model can be varied in many different ways, as we did at Roosevelt University in Chicago.¹ In our longevity studies, we used Swiss albino mice that were retired breeders and divided them into three groups:

- * Group 1 was subjected to the many mistakes humans make, including a high-fat diet, tap water as the sole drinking fluid, no exercise, exposure to cigarette smoke, and a crowded and stressful environment.
- * Group 2 was the typical control "everything standard" setup.
- * Group 3 received an above-average quality diet, fed in small quantities twice per day. They received antioxidants and other vitamin and mineral supplementation, including procaine, and exercised three times per week, no cigarette smoke. They had and used carbon-filtered water as drinking fluid. Changes in the environment were made each time the cages were cleaned. Each one of those little changes reflect a change that is similar to what's going on in real life. For example, in human life a more comfortable environment is a key factor. We therefore created a more comfortable environment for our animals, with comfortable hiding places, warm bedding, etc. Each time we cleaned the cages, we also changed objects around, included new toys, and varied the opening to the hiding places. These animals were much livelier, and it kept their brains active. We did all this without substances that activate brain functions like *Ginkgo biloba* or Eldepryl (deprenyl).

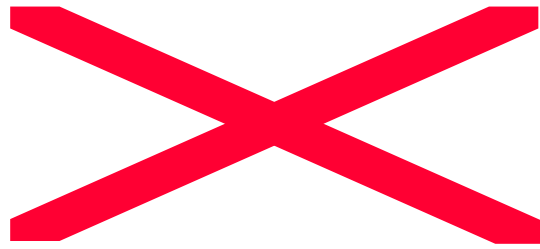
The difference in average life spans between groups 1 and 3 was close to 100 percent.

"Results you get on animals might not be the same in humans" was the earlier, major response. But I'd like to call your attention to studies by Professor Breslow done at the School of Public Health at UCLA. Researchers looked at several very basic health practices (three meals per day, physical activity, overweight, seven to eight hours of sleep, smoking, and environmental factors) of 8,000 people in a northern California area and demonstrated that doing these health practices wrong could cost as much as 13 years in average life span.

Take the average life span, about 71 at that time, minus 13, and that's 58. Doubling this brings you right into the accepted maximum life span range for humans of about 110 to 120 years. So, the data we get on animal models have correlating data in human studies.

VITAMIN AND MINERAL SUPPLEMENTATION

Vitamin and mineral supplementation, the number-one priority area in health and anti-aging, now has in excess of 2,000 publications that support taking above-RDA amounts



of vitamins. Professor Emanuel Cheraskin, M.D., of Alabama University School of Medicine, published some of the most dramatic findings in 1976. Cheraskin used the Cornell Medical Index Questionnaire, which correlates the number of medical complaints a person has per month to the intake of any one or more specific nutrients. In the illustration shown below, a group of 1,500 health professionals and their family members were studied and the average person had 15 medical complaints per month. When, by computer design, subgroups with fewer and fewer medical complaints were picked out and studied, it was found that as medical complaints decreased, intakes of specific vitamins increased. For people who had no complaints, (optimum health), the vitamin intake (vitamin A and niacin) had gone up to four to eight times the RDA.

Professor Cheraskin is one of the leaders who changed health professionals' opinions regarding nutrient intakes, and his many books are a gold mine for data connecting faulty nutrition and disease. He recently published an updated version of his many findings. *Human Health & Homeostasis* is must reading for everybody in the health field.² For nutritional facts as they relate to treating diseases, see *Nutritional Influences on Illness* by Professor Melvyn Werbach.³

Procaine (or GH-3), also included in the diet of group 3, was one of the earlier anti-aging drugs used in Germany and Romania. My father, for example, is 93 now. A retired pharmacist, he took it for 60 years and swears by it. It is a little bit of an antidepressant, enhances immune functions, and definitely improves attention deficit.

STRESS AND DISTRESS

Another emphasis is on stress management, and the key book in this area is still a simple paperback by Hans Selye, *Stress Without Distress*. Professor Selye defines the point when stress turns into distress; you ought to recognize that and then do something about it and so on.

How can you put the animals in our longevity studies under stress? It's very simple. Put a rat into a regular metal cage. There is a simple light bulb. The light goes on, and 20 seconds later there's a very small electrical shock—nothing that would hurt the animal in

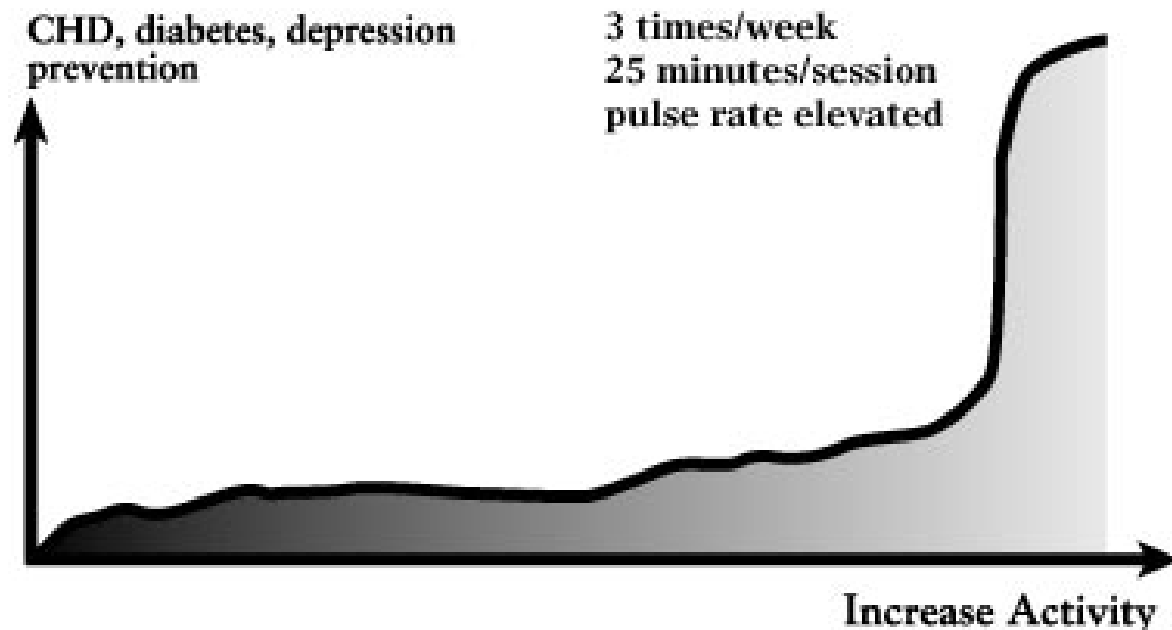
any way or another. But when that light goes on, the animal starts worrying. It interrupts immune functions and does all kinds of things, and the animal's health and longevity is affected. However, things change quickly if you allow the animal to adjust. Put a simple wooden block into that cage. The animal learns that when the light goes on, all it has to do is jump on the wooden block to avoid the shock. Guess what? That animal lives even longer than the control, most likely because it learns how to deal with distress, but also because of the added physical activity.

PHYSICAL ACTIVITY: HOW TO ACHIEVE OPTIMUM RESULTS WITH THE BEST ANTI-AGING EFFECTS

Look at very old people and the way they shuffle along, often with a cane, and you get the feeling that a little wind could blow them over. Naturally, this is because they have no strength and very little lean body mass. Maintaining muscle and lean body mass is not only important for doing physical tasks, but it's also a key factor in maintaining blood sugar homeostasis, hormone levels, and weight control. Even though doing some aerobic exercise is important, many experts in this field think maintaining lean body mass is a top priority.

Since physical activity is a key factor in the FASE detox program, and it is also the only true and proven anti-aging modality, it's important to get the maximum anti-aging effect with a minimum of effort. Plotting increasing physical activity versus optimum CHD prevention, diabetes prevention, and lean body mass maintenance, we find that optimum protection is achieved with the following minimum requirements: exercise done at least three times per week, for a minimum of 25 minutes (without interruption during each exercise session), and a pulse rate elevated into the correct range (Figure 1). To maintain lean muscle mass, weight training should be incorporated into the exercise program.

Maintaining muscle mass is a high priority in the overall anti-aging strategy. Therefore, in addition to weight training, it is advisable to consume a small amount of lean protein every 2 1/2 hours because it is at that point, after a meal, that protein degradation becomes larger than protein synthesis.



Based on the knowledge that neurotransmitter balances change with aging, inducing a higher incidence of depression, and that exercise is a strong antidepressant, Dr. John Greist of Wisconsin University—using the SCL-90 depression score—proved the effectiveness of exercise in treating depression.

Many different types of exercise give good results with respect to heart disease, diabetes, and depression prevention, as long as minimum requirements are fulfilled. It is this author's belief, however, that super-circuit training gives the best results because it also incorporates weight training for muscle maintenance and body shaping. Super-circuit exercise combines muscle and aerobic exercises, with frequent shifts between the two modes.

The biggest excuses are "I guess it's too late for me, I've never exercised," or "I'm too old," or "With all my aches and pains, I just can't exercise," or—from women—"I just don't want to get muscular." Ladies, with your differences in hormones, you'd have to exercise like a true athlete to become muscular. I recently gave a talk about fitness to a men's club, suggesting that building up lean body mass, especially around the shoulders, and losing these extra pounds around the middle would greatly rejuvenate their appearance. A marathon runner disagreed with me: "Come on Hans, after the age of 55 or so, it's almost impossible to build muscle mass." I responded—"Frank, you are so full of it, I'll prove it to you. I'm 63, and I'll gain 15 pounds of muscle within two to three months." We did underwater weighing—the best method to determine body fat—and I increased bulking exercises. Within two months I had lost two percent of my body fat and

gained 16 pounds of muscle. This was such a turn-on that I kept going. I went from weighing 184 pounds, up to 204 pounds. *It feels great.* it's hard work, but it's worth it. If others can do it, you can do it! Look at Bob Delmonteque, age 80; he frequently shows off his body in the *Journal of Longevity*. At age 62, my good friend, Dr. Paul Ward, an Olympic trainer, just made "National Masters Olympic Lifting Champion" for the fifth time.

If you have any problems along those lines, or if you are in any specific area of fitness and you really want to know how to achieve optimum performance or how to bulk up, there's a magnificent book by Dr. Paul Ward and Dr. Robert Ward. Robert is a former Dallas Cowboys conditioning coach. The book is *Encyclopedia of Weight Training*. It is absolutely fantastic. This book will tell you, based on your choice of activity or sports, how to exercise to get the optimum results. It's been praised by a lot of trainers in all kinds of areas, including basketball, football, weight lifting and bodybuilding.⁴

CAN ANTIOXIDANTS PROTECT YOU FROM CIGARETTE SMOKE?

Let's look at a few data regarding smoking cigarettes. There are some "researchers" who tell you that cigarette smoke can be counteracted by taking antioxidants. Well, that's not really so. It's only partially true.

We took animals and divided them into four groups. Group 1 was subjected to cigarette smoke. Group 2, subjected to cigarette smoke but with extra antioxidants in the diet, lived a little bit longer than group 1. Were they protected by the antioxidants? Yes, definitely. However, then we compared this to animals that were not subjected to cigarette smoke (group 3), and they lived even longer than group 2. Group 4 did not smoke and received antioxidants, and the average life span of those animals was even longer than group 3.

So you have to take everything with a grain of salt and see what actually happens.

PEOPLE BAFFLE YOU

People are very strange creatures. Apparently concerned about their health, they roll into our office, 50 to 100 pounds overweight, with a cigarette box in their shirt pockets, and they want you to prescribe a magic pill they can lay on their stomach that lets them wake up rejuvenated and reshaped in the morning. If you don't prescribe it for them, and you try to get them to change their lifestyle, they roll out of your office, obviously in the direction of somebody who has this new magic diet. The above examples are nothing unusual and are straight out of my own encounters with patients. Want to hear more strange things? Just ask a doctor who works in this field. But do they ever learn? Some of them will, but only if you use the right approach. Use a health evaluation quiz that puts their problem areas right in front of their faces. Stay cool, factual, and sock it to them! Paint a picture—possibly with realistic photos of heart surgery or cancer—that they won't forget and that will make them sweat just thinking about what you said. Be prepared to lose a few patients, but what do you want to achieve anyway? Do you want to win a popularity contest or really help them?

DESIGNING YOUR INDIVIDUAL ANTI-AGING CHECKLIST

In my book *Tripping the Clock*, every chapter starts with a short checklist. Respond correctly, and you can skip the chapter and move on to the next one. You are welcome to copy these checklists and combine them for your patient evaluations, or you can just use the points discussed here to design your own checklist. But I suggest that you be educational, starting every section with a short introduction, explaining why we should be doing this and how it relates to improving health and anti-aging.

THE IMMUNE SYSTEM

If you look back at what we discussed so far, I hope you'll agree that almost everything also affects immune functions in one way or another. Let me give you a quick, five-minute introduction to immunology.

I compare this to the defense of a country. There are the different branches: the army, air force, navy, and marines. Only when there is effective coordination between the branches, when they all communicate with each other, when they don't overreact, when the single troops are very well trained, only then we have a well-functioning defense (immune system) of the country (the body).

The major branches of the immune system are:

Nonspecific immunity, i.e., the macrophages, neutrophils, and natural killer cells, roam the body and kill foreign cells by ingesting them. This process is known as phagocytosis.

Humoral immunity involves B cells and antibodies that will bind with antigens and foreign cells, and with that they will mark them for destruction.

Cell-mediated immunity involves the macrophages and B cells that previously ingested foreign cells, that then present the antigens from these killed cells to T cells. The T cells then release and send out lymphokines to the nearby macrophages, basically telling them or inducing them to kill the invading cells. And that's a process generally known as hypersensitivity.

Soldiers (cells) with special training work together to make the defense network highly effective. There are the basic "soldiers," the B cells, made in the bone marrow, that can go to special training in the thymus, graduating to T cells that can actually kill cancer cells; there are cytotoxic NK (natural killer) cells that can recognize and kill infected cells; there are chemical troops, cells that have capacity to neutralize toxins spilled into the blood by invading cells; and suppressor cells that prevent overreaction of branches of the immune system.

The “generals” that coordinate, regulate, and control the actions between the different branches are called cytokines; these include interleukin, interferon, TNF (tumor necrosis factor), and others.

The immune system is the key for everything, from cancer and heart disease to aging, and that’s why maintaining this system has the highest priority.

So, is this it? Supernutrition, exercise, stress management, supplements and activating immune functions? No! There is something with an even higher priority. I would like to suggest that, unless you take actions according to what I am going to present here, your entire anti-aging program will be only about half as effective as it could really be.

TOXIC CHEMICALS ACCUMULATE IN YOUR BODY

About 15 years ago, several minor publications suggested that every adult in any industrialized country carries an average of five toxic chemicals in their bodies. Scientists from the chemical industry truly believed that this was not so and possibly a hoax, so they financed research projects to defuse this potential bomb. There were actually two pest-control executives, a husband-and-wife team, who went public and ingested 1,000 mg of DDT on TV to demonstrate its safety. Well, when the data came in, everybody was shocked: Every adult in this country, or in any industrialized country, carries between 50 and 100 toxic chemicals in the body, mostly in adipose and nerve tissue; tables of them are reproduced in my book *Tripping the Clock*, and in many publications dealing with this body pollution.¹⁰

As documented in every detail by Professor Max Daunderer (*Umweltgifte, Diagnostik und Therapie*. Germany: Ecomed), it takes about 20 or 30 years for these toxic chemicals to accumulate in your body. Due to the lipophilic properties of body tissues, no matter how small that amount is, it will be retained in your body, and it will stay there and accumulate.⁵ At first these chemicals find their way into the environment, and from there into the human body, where they suppress immune function and affect nerve functions. An evaluation of the available data suggest—pretty much prove—that immune functions are decreased to levels as low as 50 percent of original capacity.⁶

When I started with this idea about five or six years ago, we had only about 15 publications that supported our thinking. Today we have over 450 publications. For more details, see my extensive papers in *Anti-Aging Medical Therapeutics*, Vols. I and II.

TOXIC METALS—MERCURY

Let’s take a quick look at mercury. Recently there was a study that evaluated mercury levels in the brain, expressed in nanograms per 100 grams of brain tissue. The researchers compared dentists, dental assistants, people who have amalgams, and those who have no amalgams. Look at the differences: 1,600 for dentists, 1,300 for dental assistants, 28 for people who had an average number of amalgams in their teeth, and seven for people who

had no amalgam fillings. Is that maybe an explanation for the high suicide rates among dentists?

While there are already studies that show great improvements in health and immune functions when amalgam fillings are removed, the ADA sees nothing wrong with stuffing one of the most toxic metals into parts of the human body (teeth). It is time-released into the body and accumulates in other body tissues, affecting nerve and immune functions and much more. I have discussed this topic with dentists who still use amalgams, and I find their blind trust in the ADA position, and their refusal even to take a look at the published data that demonstrate amalgam's toxicity, outright scary. Professor Dauderer, in his book *Umweltgifte*, lists 1,800 references regarding the toxicity of mercury. I believe that removing amalgam fillings from your teeth—maybe not all at the same time—must have a pretty high priority. Whenever you have a tooth worked on, and part of your mouth is already numbed up, ask your dentist not to use amalgam and have any mercury in an adjacent tooth also removed. There are so many new good non-toxic cements available, there is no reason to put yourself at risk.

EFFECTS ON IMMUNE FUNCTIONS

Look at the various parts of the immune system that are affected by toxic chemicals. B cells proliferate in response to an antigen. Pesticides reduce B cells and proliferation.

Earlier, I mentioned hypersensitivity. Macrophages, B cells, and T cells work together to destroy invading agents, leading to a form of immunologic memory. Pesticides suppress hypersensitivity. In the spleen, macrophages mature and interact with T and B cells. Pesticides create abnormalities in the spleen and the spleen weight, and they also affect the development of macrophages.⁷

Secondary antibody response defines the speed of antibody formation and the total number of blood cells in the system. Pesticides reduce that. People are chronically exposed to many types of toxic chemicals; this includes anything from polychlorinated to polybrominated hydrocarbons, aromatic hydrocarbons, and chemicals that are used to treat wood. There are chemicals that you inhale when you pump at the gas station. There are pesticides on foods. Recently, the FDA examined some strawberries that came from Mexico, and on one basket of strawberries alone they found the residuals of 16 different pesticides.

INCREASE IN MANY DISEASES

People in pesticide application zones, with respect to inflammatory kidney and infectious kidney disease, show a fivefold increase. People who are living close to storage facilities of pesticides show an eightfold increase.

Organic toxic chemicals increase infections of the respiratory and the digestive tracts. For example, look at the statistics. In spite of the war against cancer, 10 types of cancer have increased over the past 20 years. Increased? Isn't that alone proof in itself?⁷

NUMBER-ONE PRIORITY: AN EFFECTIVE DETOX PROGRAM

Having demonstrated the presence of toxic chemicals in the brain, the effect of these substances on brain function, and the effect on neurotransmitter balance and immune function in general, the logical solution is first to find a detox method that removes these toxic chemicals from the body and then to focus on re-establishing

neurotransmitter balance. Such a detox method has been developed by the Los Angeles-based FASE. This detox program includes a quality nutrition component high in

DETOX:

Removes 2/3 of toxins in 2 to 3 weeks.

- 1) Exercise-and/or sauna-induced sweating
- 2) Niacin – one to two hours before exercise
- 3) Use of vegetable oils in foods/cooking

antioxidants and with adequate polyunsaturated oils; exercise- and/or sauna-induced sweating; and large amounts of niacin taken about one hour prior to the induced sweating. This detox is quite effective; about 60% of toxins are removed in two to three weeks (Table 1).

Most recently we developed a special detox formula, [CAA-11 Detox](#), that includes non-flushing niacin (niacin amide and inositol hexaninotate).

Drug Abuse Is A Key AIDS Risk Factor

Berkeley Professor Peter Duesberg, the man who says that HIV most likely is not the key contributing factor in AIDS, was a member of the team that determined the structure of the HIV virus. He consequently published a paper suggesting that there are lots of things wrong with the HIV=AIDS hypothesis, and that scientists should take another look at this hypothesis. He was immediately ridiculed, and blacklisted, and his research funds were cut. How dare he disagree with the HIV=AIDS establishment system that was based on theft, lying, cheating, ignoring scientific principles, falsifying data, and much more.⁸ In the meantime, many scientists from around the world have joined him and founded a

group called REAPPRAISING AIDS, and that includes the 1993 Nobel Laureate Kari Mullis, the discoverer of the (viral analysis) PCR technique.

I suggest that you visit the Berkeley Web site www.duesberg.com or send a small donation to REAPPRAISING AIDS to get their most important reprints.¹¹

Luc Montagnier of the French Pasteur Institute agrees that HIV needs cofactors to really cause AIDS. I, and others, have suggested that drug abuse causes these cofactors.

The Berkeley group recently published data showing that six major medical publications from around the world demonstrated a 93–100 percent connection between drug abuse—I say abuse, not use—and AIDS. And we are talking here about anything from cocaine, amphetamines, heroin, crack and all these things, but not marijuana.

The cause of addictions with drugs is pretty much established. There are metabolites of drugs that remain in adipose and mainly nerve tissue. Those are the substances that induce repeat use in users. For some addicts, the effects of these drug-leftovers in the body is too strong, and “just say no to drugs” doesn’t work.

Present-day drug rehab rates are only about 10–15 percent successful. When you include this detox method, it goes up to about 60–70 percent. This is magnificent.

Cytokines and Specific Immune Enhancers

PHYCOTENE

Phycotene, discovered by Dr. Christopher Hills, was found to increase tumor necrosis factor (TNF) by 500 percent by researchers at Harvard University School of Medicine.⁹ This is an expensive substance, \$420 for 30 grams, but it is a powerful immune stimulant. Recently, many publications showed that TNF can cause apoptosis (chemically induced suicide) in cancer cells.

DIMETHYLGLYCINE (DMG)

Stick extra methyl groups (methylation is an important process) on the amino acid glycine, and you get DMG (dimethylglycine) or TMG (trimethylglycine). These substituted amino acids stimulate alpha-interferon production as much as 500 percent in the body.

Check out any one of the newer textbooks on immunology, and you’ll find that there is great synergism between TNF and alpha-interferon. That’s why it is important to take those two substances together.

THYMIC PROTEIN-A

What—or who—is the special training “sergeant” that converts regular B cells in the thymus into T cells that can actually kill cancer cells? It is thymic protein-A. Researchers identified the gene that codes for thymic protein-A, cloned it, and inserted it into beef thymus cells. These cells, in the laboratory, now kick out thymic protein-A; it is purified, and comes as a sublingual powder. As you know, the thymus atrophies with age, and therefore the T cell production decreases as we get older. Possibly, this is one of the major factors in the increase in cancer with age. Instead of giving you lots of references, I suggest that you contact Klabin Marketing; they’ve put together an excellent information package and will send this, without charge, to health professionals.⁹

ENZYMES

The literature on enzymes is increasing dramatically. In the earlier years, using enzymes was always associated with improving digestion. The largest manufacturer of enzymes in the world, Wobenzym (Germany), recently sponsored research where enzymes were given on an empty stomach and absorbed into the bloodstream. Professor Karl Randsberger, head of research at Wobenzym, sent us documentation that showed that enzymes (given on an empty stomach, either 45 minutes before, or 2 1/2 hours after a meal) improve every disease-treatment regimen by about 30 percent, even multiple sclerosis. Two studies stick out and show the tremendous potential of enzymes:

HEART DISEASE: People who needed heart transplants, with no donor hearts available, are usually put on a standby machine that takes over the pumping of the blood. Patients who were on those standby machines were given large amounts of enzymes, and within a few months in more than one third of them their own hearts recovered, not needing any more transplants.

CANCER: In a large study in Europe, 12,000 cancer patients from different countries who had undergone cancer treatments were divided into two groups. One was given enzymes, the other wasn’t. Average survival life span was about five years for the regular group, but 11 years for the group that was given enzymes.

SELENIUM

Selenium got a lot of attention recently. It was discovered that in people who took 200 mcg of selenium per day it reduced prostate cancer by 60 percent, lung cancer 50 percent, and activated immune functions.

What is selenium? Selenium (Se) is an essential trace mineral. When present in the soil, it is picked up by crops grown on the soil, and it gets into the food chain. The problem is that the selenium content in most soils is very low, and not enough gets into the food chain. Processed junk food is also low in selenium. Only in a very small number of locations is selenium high in the soil, sometimes even high enough to cause selenium toxicity, but people who live in the very few high-selenium locations are usually made aware of this fact by health authorities.

The major researcher in this field, UCSD Professor Gerhard Schrauzer, correlated optimum immune functions and maximum cancer protection in humans with selenium intakes of 350 to 400 mcg/day. The average person gets about 150; so you have quite a deficiency per day.

We have been including selenium in supplementation programs with healthy people and cancer patients for several years now and believe that the available data—even though limited—suggest that selenium supplementation dosages should be quite a bit higher (for both) than the presently used 50 to 100 mcg/day for healthy people and 100 to 300 mcg/day for people with cancer.

Recent findings: Doctors in Germany who include selenium supplementation in their regimens for cancer patients observed that blood selenium levels of healthy people are quite low, and that those of cancer patients are almost close to zero. In order to bring blood selenium levels of cancer patients up to acceptable levels, from 2,000 to 5,000 mcg/day had to be given for several months. In one specific case, a male cancer patient was given 3,000 mcg/day for several years, and without selenium toxicity. Low-level supplementation, as mentioned above, does little or nothing to bring selenium levels up to normal.

The doctors who use selenium supplementation for cancer patients believe that the following is correct: in order to be effective, the approach must be multi-factorial, including everything from supernutrition to improved health practices, general supplementation, and immune enhancement. During a disease state like cancer, selenium excretion increases and tumors also absorb selenium at a very fast rate. When selenium levels come back up to normal, some tumors become benign. There is evidence (Max Planck Institute, Germany) that the DNA can code for a seleno-protein that can turn off the cancer mechanism (oncogene).

Dosages believed to be necessary for people age 40 or older, yet safe enough not to cause selenium toxicity, are around 1,000 mcg/day for two to three weeks, then 500 to 600 mcg/day for another two to three weeks, and then 150 to 300 mcg/day. Doctors use even larger initial doses for people with cancer. The younger people are (not having been on a selenium-deficient diet for many years), the lower initial selenium supplementation should be.

Blood selenium analysis: To make sure that you are on the right track, and to prevent possible selenium toxicity, you must have selenium blood analysis done (whole blood, purple top tube containing EDTA).

APPLIED IMMUNE-ENHANCEMENT

Over the past years I have been working with physicians in enhancing immune functions for cancer patients, and we had some tremendous successes, even reversing some cancers. For details see my paper in *Anti-Aging Medical Therapeutics, Vol. I*.

AGE-RELATED MEDICAL PROBLEMS

Many natural formulations are quite effective in treating age-related disorders. Look at the highly effective approaches to prostate problems with *Saw palmetto* and *Pygeum*, attention deficit improvements with GH-3, activating male hormone levels with various herbs and androstenedione. Prosexual formulations to stimulate reactivate sexual functioning, and several highly effective formulations for arthritis.

ELDEPRYL, GROWTH HORMONES, OTHERS?

You decide which one of the other anti-aging or alternative medicines you want to include in your checklist.

The Future: Cloning, Gene-Therapy, Nuclear Transfers

BREAKING THE SOUND BARRIER OF AGING

The third surviving theory on aging, by Berkeley Professor Leonard Hayflick, suggests that a limited number of cell divisions, built into our genes, limits our maximum life span to about 110 to 120 years.

If you take fibroblast cells from an embryo and grow them outside the body, they'll divide 60 times and die. Let them divide about 20 times, stick them into the freezer for any time period, and when you'll unthaw them, they'll keep dividing up to 60 and die. Take those cells from a young person and they'll divide about 40 times; take them from an old person, and they'll divide about 10 times and then die. You can give those cells the best or worst nutrition, and you will be able to shorten or lengthen the average life span of the cell culture, but those cells will die when 60 cell divisions are completed.

Cells from an animal that lives about twice as long as humans, the Galápagos tortoise for example, have a maximum number of cell divisions of 120—a direct correlation between maximum life span and the number of cell divisions.

At the end of the DNA double helix you have two little things sticking out, called telomeres, and in humans they have 60 subunits. Each time a cell divides, one of those subunits is chopped off, and when they are all used up, the cell dies. Dr. Michael West, a founder of Geron Corporation, now president of Advanced Cell Technology was involved in a research project that discovered telomerase, the enzyme that sets telomere length back to the full potential when a child is conceived. They cloned the gene that makes telomerase, and via a virus, stuck it back into human fibroblast cells—and those cells now keep on dividing. Normal cell divisions, no cancer, no DNA damage! They have cell cultures equivalent to 400-year-old people. Each time a cell divides, and the telomere is shortened by one segment, the telomerase just adds one. It's so simple.

GENE THERAPY

Scientists from all around the world are cooperating in deciphering the human genome. Earlier estimates suggested that the human genome project would be close to complete around 2005. However, automated DNA-sequencing machines have greatly accelerated the rate at which human genes are fully identified.

Around the middle of 1999, geneticist maverick Craig Venter and Perkin Elmer Corporation announced a \$200 million project that focuses on determining all of the major genes in about two years. They are going to patent each one of your genes and make lots of money with them.

And this is really where the action is going to occur. The rate of gene discoveries is already so fast that, on an average, each week two disease genes are identified.

Once a gene is identified, it can be cloned, then (to find best rate of infection) it is inserted into a number of different carrier viruses. From there it is only a short step to put a normal gene into a person who has a disease caused by a defective gene—and the disease is history.

TELOMERASE THERAPY

Introducing the telomere gene into cells in our body that have stopped functioning efficiently is another area that looks highly promising.

Liver disease? Remove some liver cells, revitalize them via inserting the telomerase gene, seed them back into the liver, and regeneration might be a snap.

CD-4 cells in AIDS patients get worn out quickly. The length of telomeres in 20-year-old AIDS patients is equivalent to 70-year-olds. Revitalize CD-4 cells of AIDS patients via inserting the telomerase gene into them and you have created soldiers that never quit.

How about cells of the immune system that wear out with age? Revitalize them via the introduction of the telomerase gene and you've created an immune system that can deal with anything.

NUCLEAR TRANSFERS

We have recently learned about the partial successes with implanting embryonic cells into the brain to treat Alzheimer's and Parkinson's disease. Even though there is a process known as chimerism—the coexistence of cells with different DNA—these implanted cells from another being will most likely cause the immune system to react against them.

Take a denucleated cell, transfer a nucleus from the patient with the disease into this cell, grow it in the laboratory, and then implant it into the patient. Same DNA, no adverse

immune response! All these techniques have already been proven possible in the laboratory.

You can now see why I believe that the future of aging and research will be in these fascinating areas.

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