# Smart Life Forum

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NEXT MEETING: Thursday, August 18, 2011, at 7pm

# Harvey S. Bartnof, M.D.

on

# Longer Life, Quality of Life, & Telomeres: TA65

## Short Presentation:
## Natural Vision Improvement & living with Glaucoma
### Presented by: Meir Schneider, Ph.D., L.M.T.

Meir Schneider is the author, educator, pioneer therapist, and founder of San Francisco's nonprofit School for Self-Healing. Applying the principles he discovered while overcoming congenital blindness, Schneider developed a unique therapeutic healthcare system combining movement, massage and self-massage, breathing, visualization and vision exercises. His publications include *Movement for Self-Healing, Yoga for the Eyes, Meir's Miracle Eyesight Method*, *The Handbook of Self-Healing, and The Natural Vision Improvement Kit.* He has spent the past forty years successfully teaching the public to improve their vision with his self-healing method.

Tonight's lecture will focus on natural vision improvement with an emphasis on glaucoma - a leading cause of blindness. Doctors attribute the cause of this vision loss to elevated eye pressure and resolve that it can only be controlled by the use of very toxic eye drops. I have found that there is more to it than elevated eye pressure and a much safer alternative to drugs.

Elevated eye pressure can also stem from poor blood flow to the head due to stiffness in the body – particularly the neck and head. Each optic nerve has a million nerve fibers and transfers a billion messages per minute. This requires a tremendous amount of circulation which is a real problem for most modern people due to lifestyle. Improving ones circulation can help reduce elevated pressure. Lastly, and very important for healthy eyes and good vision, is a balanced use of the eyes. This imbalance leads to a neurological compromise and a myriad of visual and physical problems. I will be teaching you a few simple self-massage techniques as well as what it means and how to use your eyes in a balanced mode.

Private appointments, workshops and trainings are available at the School for Self-Healing. For more information go to our website at www.self-healing.org or call our office at 415-665-9574

**Extra!** Don't miss our own **Stanford Field**'s paper about **"The Smart Life Forum Story"**, included as a supplement .at the end of this newsletter.

**Foundation for Mind Being Research (www.FMBR.org)**
Next meeting, September 23: speaker Connie Grauds will present "The Science and Spirit of How Nature Heals".

### Presentation Location:

Cubberley Community Ctr.
Room H1
4000 Middlefield Rd.
Palo Alto, California

***For those who cannot attend we will have live streaming and video archiving at http://SmartLifeForum.org/live***

### In This Issue

# Meet Harvey S. Bartnof, M.D.

Harvey S. Bartnof, M.D. is Founder and Medical Director at California Longevity and Vitality Medical Institute® in San Francisco, California. He was born in Los Angeles and completed his undergraduate BA in Biology with High Honors from University of California, San Diego, Revelle College.

Dr. Bartnof is a graduate of University of California at San Francisco School of Medicine where he received Honors in Internal Medicine, Pediatrics, Cardiology, Clinical Pharmacology, and Otolaryngology. His post-graduate training in Internal Medicine was at Harbor-UCLA Medical Center in Torrance, California. He also served on the Clinical Faculty at U.C. San Francisco School of Medicine for 8 years. In addition, Dr. Bartnof is Visiting Professor of Medicine at Liaoning Medical College and Shenyang Medical College in the People's Republic of China.

He has hosted an Internet Radioshow called, "Age Management Medicine in the 21st Century" on www.VoiceAmerica.com. Dr. Bartnof is currently a member of the Endocrine Society and the Bio-Identical Hormone Society. He has been a Speaker on the Anti-Aging Panel at the annual New Living Expo in San Francisco for several years. In addition, he has presented lectures about Age Management Medicine and Bio-Identical Hormone Replacement Therapy in several venues, including physicians and medical students in China, the U.S. Age Management Medicine Group, and the California Society of Addiction Medicine.

His hobbies include music, reading and futurism. Dr. Bartnof lives in San Francisco where he practices full-time Age Management Medicine at his Institute.

## Future Speakers:

September 15: Harvey Bigelson, MD on Blood Analysis

October 20: Raymond Francis, PhD, on Treating Cancer

November 17: Ed Park, MD, Study of Telomerase Users

## About Smart Life Forum

Smart Life Forum, Inc. is a 501(c)(3) California nonprofit corporation whose primary mission is to provide credible health education to the public with an emphasis on optimal wellness, anti-aging medicine, and longevity.

Annual memberships in Smart Life Forum, Inc. and charitable donations are tax deductible to the extent allowed by law. For information on how to join or make a donation, please visit our website: www.smartlifeforum.org.

For questions, please contact Mike Korek at (650) 941-3058.

*Main Presentation:*

# LONGER Life, LONGER Quality-of-Life with LONGER Telomeres: A Role for TA-65?

## by Harvey S. Bartnof, M.D.

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**Additional specific information will be presented:**

- **Mice models of telomere modulation and aging;**
- **Co-factors that decrease telomeres;**
- **Co-factors that increase telomeres;**
- **TA-65 supplementation in mice to increase telomere length; and**
- **TA-65 supplementation in humans to increase telomere length and quality-of-life.**

The ongoing research story regarding telomeres and telomerase in human disease and aging is fascinating. And it is very relevant to our humans' ongoing quest to maintain quality-of-life and to delay and prevent diseases of aging. The number of published information about telomeres has mushroomed dramatically with time. As of July 2011, there are now approximately 13,000 abstracts under the search term 'telomere' at the US National Library of Medicine. Abnormalities in telomere functioning represent a co-factor for the development of a range of human genetic, degenerative, aging diseases and cancer. Due to their ground-breaking work in discovering how chromosomes are protected by telomeres and the enzyme telomerase, The 2009 Nobel Prize in Physiology or Medicine was awarded to Professor Elizabeth Blackburn, PhD (University of California at San Francisco), Carol W. Greider, PhD, (Johns Hopkins University

School of Medicine) and Jack Szostak, PhD (Harvard Medical School).

**What are Telomeres?**

Telomeres are DNA-protein structures that cap the end part of chromosomes in cells. "*Telos*" is a Greek term that means "end" and "*meros"* means "part". The telomeres help to protect the DNA genetic material from unraveling in between normal cell divisions. Without telomeres, chromosomes would lose some genetic material with each cell division—a consequence of which would lead to cellular malfunction, disease and eventual death. Cells can only divide a finite number of times, defined *in vitro* (in test tube) as the "Hayflick Limit." This was first described by Dr. Leonard Hayflick in 1965. Specifically, telomeres are made of DNA base pairs, with a protein cap called "shelterin." When the telomeres are too short, telomeres signal to stop cell division, undergo cell senescence and "apoptosis" (programmed cell death). Telomeres are longest at the time of conception (15,000 base-pairs), are shorter at birth (10,000 base-pairs) and become progressively shorter as we age (loss of additional 5,000-7,000 throughout life). Although the rate at which the telomeres shorten varies significantly between individuals. The first identification of a telomere sequence in the *Tetrahymena* species was discovered by Elizabeth Blackburn and Joseph Gal in 1978.

**What is Telomerase?**

Some cells require the telomere length to be maintained. Such cells include the "germ" cells (sperm and egg cells in the ovary) and stem (precursor) cells. Some immune cells occasionally need a burst of quick replication to fend off infection and maintenance of telomere length. So the enzyme "telomerase" is present in these groups of cells to help maintain the length and functioning of the telomere structure. However, for reasons that are not completely understood, most of the other cells in the body do not have enough telomerase generated to maintain the telomere length. (One reason would be nature's plan to render each of us humans inevitably to become senescent, with a progressive decline in cellular function, leading to degeneration, disease and eventual death.) Specifically, telomerase is composed of TERT (telomerase reverse transcriptase enzyme), TERC (telomerase RNA component), dyskerin protein, and other proteins. These terms are relevant later in this overview. The discovery of the telomerase reverse transcriptase enzyme was by Carol Greider, PhD working as a postdoctoral student at the laboratory of Elizabeth Blackburn, PhD in 1985.Telomerase does have other functions. They include helping to mobilize stem cells (early, precursor cells) and to modulate production of ATP, the universal energy currency in cells.

**Telomere Length**

The length of telomeres mostly has been measured in white cells from blood (leukocytes). Sometimes, separate measurements use the lymphocyte subset of leukocytes. In research studies, telomere lengths have been measured in many cell types from various organs in the body. Newer tests available for research use a cheek swab of cells.

The telomere length is increasingly recognized as an index of biological age that predicts incidence of age-related diseases, as well as all-cause and disease-specific mortality in diverse cohorts of older adults. The telomere length is highly variable: among different species; within the same species; within an organism; even between chromosomes of an organism; and is highly variable between organs from same individual. In general, the telomeres shorten with aging; however, there are a few cases whereby telomere lengths have improved (lengthened) somewhat with time. The longest telomeres have been

observed in certain types of cells: skin, small intestine, cornea, testis, and brain compartments.

Women have longer telomeres than men and in African-Americans, telomeres generally are longer than in Caucasian Americans. Other factors that affect telomere length include: heredity, paternal age at conception, environmental exposures, inflammation, and oxidative stress. Telomere length at birth is a major determinant of length throughout the human lifespan, such that individuals born with short (or long) telomeres at birth probably have a propensity to short (or long) telomeres later in life.

Genetics are not the only factor affecting telomere length. In a study published in *Aging Cell* in 2007, twins with the shortest telomeres had a three times greater risk of death during the follow-up period than their co-twins with the longest telomere measurements

**SHORTER telomeres have been associated with:**

- Diseases of aging;
- Earlier death;
- Older age;
- Male gender;
- Caucasian race (versus African-American)
- Cardiovascular disease including hypertension;
- Diabetes;
- Cancers (many but not all types);
- Obesity;
- Osteoporosis;
- Cirrhosis (liver);
- Inflammatory bowel disease;
- Chronic kidney disease;
- Chronic lung disease (chronic obstructive lung disease);
- Osteoarthritis;
- Cataracts (eye lens);
- Periodontitis (gum inflammation);
- Telomere mutations;
- Less common medical conditions:
    - Dyskeratosis Congenita, Idiopathic Pulmonary Fibrosis, Aplastic Anemia
- Stress;
- Depression;
- Low physical activity level;
- Smoking cigarettes;
- Alcohol excess;
- Traffic Pollution;
- Inflammation;
- Oxidative Stress;
- Chronic Infections (CMV, HIV, hepatitis C virus, hepatitis B virus, others);
- Certain neurodegenerative diseases;
- Cancer chemotherapy;

- Mitochondrial dysfunction (organelles in cells that produce ATP, energy currency);
- Low growth hormone.

**<u>LONGER</u> telomeres have been associated with:**

- Longer quantity of life;
- Improved Healthspan (quality of life);
- Younger age;
- Female gender;
- Physical activity;
- Dietary fiber;
- Polyunsaturated fat;
- Smaller waist;
- Omega-3 fatty acids (fish oil);
- Multi-vitamin;
- Vitamin D;
- Resveratrol (animal);
- TA-65 Supplementation;
- Estrogen in women; and
- Androgen (testosterone in men).
    - (Note estrogen in women and testosterone in men up regulate TERT enzyme).

**The importance of Telomere Length has been summarized by** Dr. Elizabeth Blackburn, PhD, Nobel Prize Laureate:

> *"Telomere shortness is associated with just about all the major diseases of aging… from cardiovascular disease, death from cardiovascular disease, risks of cardiovascular disease, diabetes, diabetes risks such as insulin resistance, vascular dementia, to osteoarthritis…The list goes on and on and the correlation is always in the same direction: shorter telomere length is associated with more disease. The association is absolutely solid now because it has been found in so many cohorts that it cannot be a statistical accident."*

**<u>Cardiovascular Risk</u>**

There are many published studies linking shorter telomeres with cardiovascular risk and disease. One of those reports is described here. A total of 800 women and men, ages 45 to 84 years were enrolled in a prospective study of cardiovascular disease in 1995. They were assessed for the presence and progression of cardiovascular disease up until 2005. The results showed that telomere length was shorter in men than in women and inversely correlated to age (low telomere, older age) and family history of cardiovascular disease. Among the 88 participants who developed episodes of cardiovascular disease events during follow-up, they had significantly shorter telomeres, when adjusted for age and gender. In multivariable models, the baseline telomere length was a significant and independent risk predictor for cardiovascular disease and its individual components (heart attack and stroke). Comparing patients in the highest and lowest third of telomere length, the former group had a 2.7-fold increased risk. This **equaled a 13.9-year difference in chronological age.** The results were the same for men and women. The authors concluded, "Our findings indicate a differential role of telomere shortening in the various stages of

atherosclerosis, with preferential involvement in advanced vessel pathology and acute vascular syndromes."

**Cancer**

There have been numerous studies linking shorter telomere lengths with increased risk of cancer and death from cancer. Many of these were ("cross-sectional" or 'snapshot') studies, which generally show "association," but not necessarily an implication for "causation." However, there have been several prospective studies, which have more statistical power to show a possible cause (shorter telomeres) and effect (cancer, cancer death) relationship.

Drs. Peter Willeit and colleagues from University of Cambridge in the United Kingdom published an update study of telomere and cancer in the July 6, 2011 issue of *Journal of the American Medical Association*. This study enrolled 1,000 adults ages 40-79 from Italy in 1990 and **followed them for 15 years**. Two telomere tests were available for 787 of them who were free of cancer in 1995 and for 558 of them free of cancer in 2005. After 15 years, 137 were diagnosed with cancer and 62 of them had died from cancer. The patients were divided into 3 different groups (thirds) based on telomere length: shortest telomeres (lowest 'tertile' or third), middle-length telomeres (middle 'tertile') and longest telomere (highest 'tertile').

The **results were striking and highly significant** ($p<0.001$). Compared to those with the longest telomeres in 1995, those with the **shortest telomeres (lowest third of group) were 3 times more likely to be diagnosed with cancer after 15 years**. And those in the middle third of telomere length were 2.4 times more likely to be diagnosed with cancer. Regarding death from cancer: compared to those with the longest telomeres in 1995, **those with the shortest were 8 times more likely to have died**, while those in the middle third of telomere length were 5 times more likely to have died. The results also showed a significant "dose-response" relationship, meaning the shorter the telomere length at baseline, the greater the risk of cancer and cancer death. [The results were adjusted (corrected) for possible confounding co-factors, including: age, gender, social class, smoking, diabetes, physical activity, alcohol, body mass index [weight divided by height], C-Reactive Protein, vitamin D, and LDL-cholesterol.]

In an earlier publication by the same group, a 10-year follow-up analysis was reported. The same highly significant pattern of results was found. They also reported that shorter telomeres were significantly associated with: older age, male gender, less physical exercise, diabetes, lower vitamin D, chronic infection, higher C-reactive protein (inflammation marker in blood), higher IL-6 (inflammation marker), and a close trend for higher Body Mass Index (weight divided by height). Cancers with a higher death rate showed stronger correlations with telomere length, but not so for more benign tumors. The authors concluded, "…our study shows that short telomeres are associated with an enhanced risk of cancer and fatal cancer in particular."

Other studies have reported that shorter telomeres are associated with significant increased risk of: bladder cancer, renal cell [kidney] carcinoma, non-Hodgkin lymphoma, lung cancer, and head and neck tumors. However, there have been mixed results for association with colorectal and breast cancer.

A meta-analysis of 27 reports on 13 cancers was published in the June 2011 issue of *Cancer Epidemiology, Biomarkers & Prevention* by researchers from the US National Cancer Institute. The conclusions were: "Short tissue telomeres are associated with cancer; the strongest evidence exists for bladder, esophageal, gastric, and renal cancers."

**Breast Cancer**

Breast cancer that occurs in younger women that is associated with maternal or daughter risk ("familial") is associated with shorter telomeres. Dr. B. Martinez-Delgado reported in *PLoS Genetics* in 2011, "Significantly shorter telomeres were found in all hereditary breast cancer groups whereas no significant differences appeared between controls and sporadic [non-familial] breast cancer cases. Specifically, the genetic types were associated with known breast cancer genes, BRCA1 and BRCA2. Other researchers have reported that these genetic markers for cancer lead to abnormal telomere function. Note that carriers of these genetic variants also are increased risk for other cancers, including melanoma (skin), ovarian, tubal (uterine), gall bladder, and in men, prostate.

**Cataract Risk**

The prevalent cataract and incident cataract surgery were determined in 2,750 participants of the Health, Aging, and Body Composition Study at the University of Pittsburgh. For 259 participants, a direct eye examination was performed to determine the presence of cataracts. Among 6 of 259 with successfully aged eye lenses, the mean blood lymphocyte telomere length was 5,700 bp (base pairs), while 253 of the 259 with poorly aged lenses had a mean telomere length of 4,770 bp. Participants with a 1,000 bp greater mean telomere length had nearly half the risk of any cataract. The authors concluded, "lens transparency might be associated with longer telomere lengths in community-dwelling older adults and should be investigated further as a possible biomarker of aging."

**Multivitamins**

Among 586 women ages 35–74 years in the Sister Study, multivitamin use and nutrient intakes were assessed with a 146-item food-frequency questionnaire. The results showed that multivitamin use was associated with significantly longer telomeres. Regular vitamin using women had telomere lengths that were 5% longer than non-users, after Age and other possible confounders were considered. Even after adjustment for multivitamin use, higher intakes of vitamins C and E from foods were each associated with longer telomeres.

***INSIGHTS FROM UNCOMMON DISEASES***

**Dyskeratosis congenita** (DC) is a human premature aging syndrome linked to mutations in the telomerase complex (dyskerin protein) resulting in decreased telomerase stability and shorter telomeres. Patients with DC develop have: short stature, hypogonadism, infertility, bone marrow failure, blood and bone marrow abnormalities, skin defects, increased malignancies & infections, early hair loss or graying, osteoporosis. Premature death occurs due to progressive bone marrow failure.
**Aplastic anemia** occurs when the bone marrow stem cells are inadequate to generate new red blood cells. Untreated, it is fatal. Many patients with aplastic anemia have abnormal telomere function and some of those patients have mutations in the TERT enzyme.
**Idiopathic Pulmonary Fibrosis** is an uncommon lung condition that can be fatal. The lung stiffens due to abnormal deposits of fibers, hindering normal oxygen exchange. Many patients with this condition have been found to have shorter telomeres, and many of them have been found to have genetic mutations in telomerase.

## Treating Short Telomeres

> *"Maintaining high levels of the telomere-extending enzyme, telomerase, by either genetic manipulation or exposure of T cells to chemical telomerase activators, not only retards telomere loss but also restores a more youthful functional profile to the T cells. These observations suggest possible novel telomerase-based therapeutic approaches to enhancing healthspan in the elderly population."*
>
> Effros RB. Kleemeier Award Lecture 2008--the canary in the coal mine: telomeres and human healthspan. *J Gerontol A Biol Sci Med Sci*. 2009 May;64(5):511-5. Epub 2009 Feb 19. UCLA School of Medicine

**TA-65**, an oral, natural supplement derived from the root of the *Astragalus* plant, has been shown to increase telomerase *in vitro* (test tube), in mice, and in humans. These changes were associated with improvements in telomere length and in humans, a decrease the percentage of short telomeres.
Mice without telomerase have a shorter lifespan and demonstrate many characteristics of premature aging, including weakened immune systems, poor wound healing, osteoporosis, and premature graying and thinning hair. Mechanisms to increase the length of telomeres, either with TA-65 or by genetic engineering in mice, have reversed many aspects of aging in mice, according to researchers at Harvard School of Medicine and the Spanish National Cancer Research Center in Madrid, Spain. Such improvements included improved regrowth of brain neuron cells, new sperm cells, return of sense of smell, increased muscle coordination, and wound healing. No increase in cancers occurred. Mice with excess telomerase age more slowly than mice of the same age without excess telomerase.
Studies of humans who have taken TA-65 show telomere improvements, particularly in cells that had the shortest telomeres. Improvements also occurred in: immune function; bone density, blood pressure, cholesterol, and cardiovascular biomarkers. Anecdotally, patients have noted improvements in libido, energy and skin quality. As of Spring 2011, more than 2,000 people have taken TA-65, for up to 4 years. No side effects have been reported, no new cancers have occurred, and no worsening of pre-existing cancers have been observed. Anecdotally, some cancers have improved.
TA-65 is a molecule derived from *Astragalus membranaceus,* a Chinese herb that has been used for centuries. Astragalus itself does not activate telomerase or increase telomeres. Geron Corporation originally discovered the molecule that activates telomerase in 2000. T.A. Sciences licensed this technology in 2002. The first human started to take TA-65 in 2007.

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Appendix:

# "The Smart Life Forum Story"

by Stan Field July 2008

## CONCEPTION

In 1992, Kathryn Grosz conceived the idea of bringing together a group of intelligent people to discuss health-oriented subjects with the

aim of learning how to improve their lives. It was realized that medicine (diagnosis and treatment of disease) did not concentrate on health.

Kathryn did a tremendous amount of advertising and promoting to get people to attend. At the first meeting, only three people came. Her bill for the meeting room was $200. Although this route was too expensive, her enthusiasm did not allow her to give up.

She moved the meetings to her home to save renting costs in a hotel. She even cooked meals in her home for members so they could leave work, have dinner and be at the meeting on time. Through advertising, she usually had 45-50 people at each monthly meeting. At one meeting, she had 90 people for dinner. She did this for a couple of years to acquire a critical mass of intelligent people to explore the impact of nutrition, environment and lifestyle on overall health. She spent thousands of dollars of her own money and an untold amount of time to create the Smart Life Group.

## SUCCESS AND BURNOUT

Kathryn was her own Board of Directors. She arranged to get speakers and she wrote the newsletter. She also sponsored and arranged two national conferences for the Smart Life Group. She was so dedicated to the success of this venture that she eventually consumed all of her life savings! She could not continue the intensity required to make her dream a success. However, her strong will and intelligence would not allow failure. Kathryn then formed the Board of Directors to take the workload with the hope that the Smart Life Group would survive. She had done the work of many people. She was doing the impossible!

## SURVIVAL AND GROWTH

In 1996, I had bought the Smart Drugs books and then started a subscription to "Smart Drugs News" written by Steve Fowkes. I appreciated his ability to write clearly about technically complicated subjects. One day I called Steve and asked him about Smart Life Forum which appeared in one his reports. I discovered that Steve was the first president of SLF.

Never in my wildest dreams did I expect to find such a vibrant group of intelligent people (30-40 at each meeting) interested in all matters of health and longevity. I was so energized that I volunteered to write the monthly newsletter of the **Smart Life Forum.** Previously, the newsletter was written by Tony Barbella. The Program Director (the person who arranged to get the speakers) was Harvey Miller.

In the year 2000, Phil Jacklin became the second SLF president.

He and Mike Korek, the new Program Director, expanded the meeting attendance to 100-150 people which required a major change in the capacity of meeting facilities.

**SLF** changed my life! Enthusiastically I began to study biochemistry and physiology using my chemical engineering background with the hope and determination to stay healthy to the end.

Over the years, there have been many knowledgeable speakers who have educated us. At a recent SLF meeting, (April 2008), 180 people listed to Dr. Stephen Strum, one of the foremost in his field of medical oncology, give an outstanding two-hour lecture on: **Principled Medicine: Using Concepts to Promote Superior Medical Outcomes.** Everyone there was charged up!

A great deal of information about leading a healthy lifestyle is located at our website: www.smartlifeforum.org

## HONORING KATHRYN

In May 2008, Kathryn Grosz was honored by SLF by giving her a plaque of appreciation. The plaque said:

"This is to express our appreciation for your superb and successful effort to create The Smart Life Forum. Your unrelenting drive assembled a critical mass of intelligent people to explore the impact of nutrition, environment and lifestyle is unique. Thanks to you, members of Smart Life Forum are knowledgeable enough to achieve health and avoid the dangers of conventional medicine and pharmacy. Kathryn, we salute you!"