

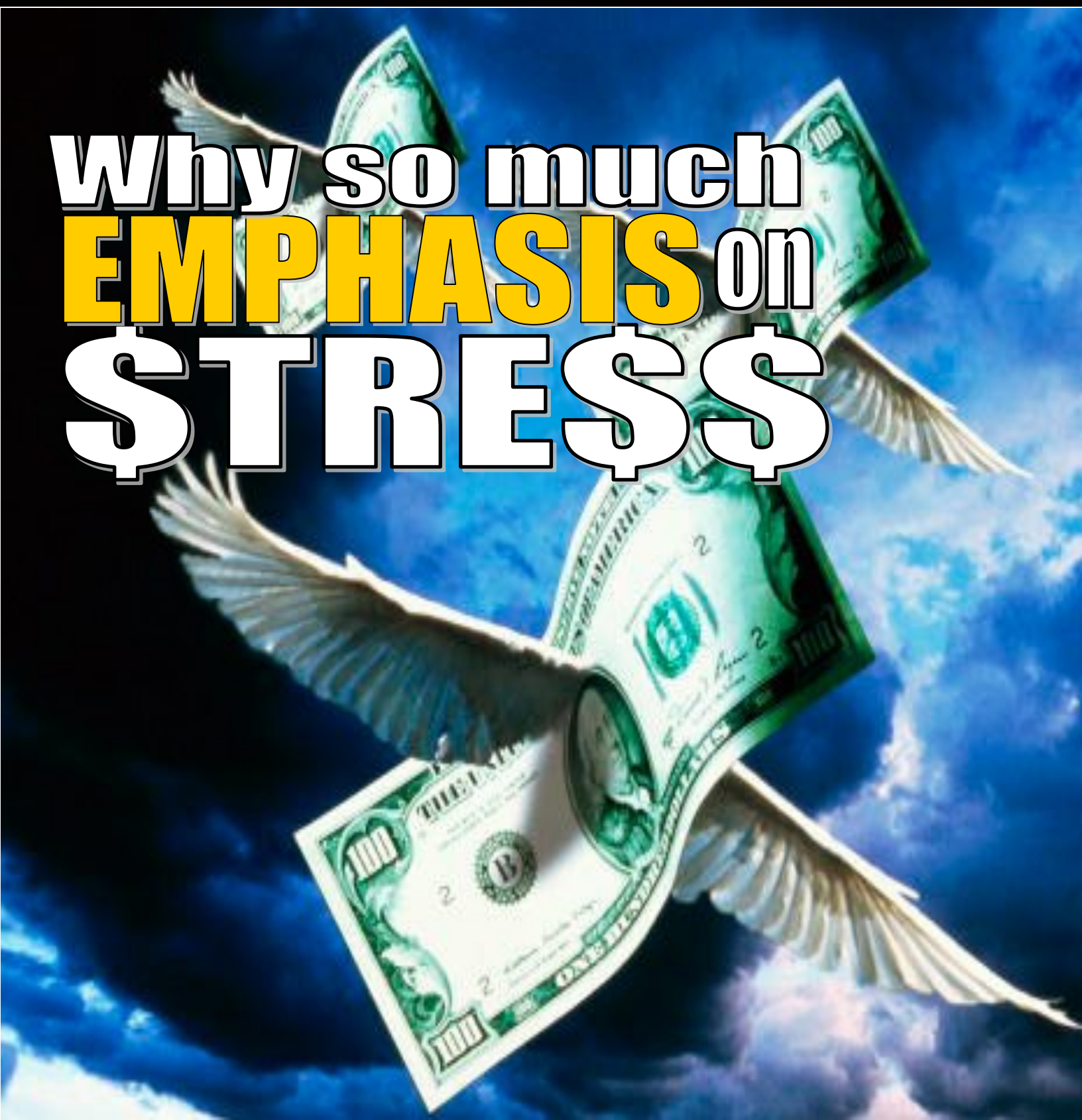
The American Institute of Stress

HEALTH AND STRESS

Your source for science-based stress management information

Volume 25 Issue 11

November 2013



Why so much
EMPHASIS on
\$TRESS\$



The mission of AIS is to improve the health of the community and the world by setting the standard of excellence of stress management in education, research, clinical care and the workplace. Diverse and inclusive, The American Institute of Stress educates medical practitioners, scientists, health care professionals and the public; conducts research; and provides information, training and techniques to prevent human illness related to stress.

AIS provides a diverse and inclusive environment that fosters intellectual discovery, creates and transmits innovative knowledge, improves human health, and provides leadership to the world on stress related topics.

HEALTH AND STRESS

We value opinions of our readers.

Please feel free to contact us with any comments, suggestions or inquiries. Email: editor@stress.org

Editor In Chief:

Paul J. Rosch, MD, FACP

Associate Editor:

Helen M. Kearney, PhD

Creative Director: Kellie Marksberry

\$20 per issue or \$120 annual subscription rate.

Free with membership in AIS.

Stress and Health is a monthly newsletter with news and advertising designed exclusively for AIS Members. However, it appeals to all those interested in the myriad and complex interrelationships between stress and health because technical jargon is avoided and it is easy to understand. Stress and Health is archived online at stress.org. Past issues can be purchased in the AIS Marketplace. Information in this publication is carefully compiled to ensure accuracy.

Copyright © 2013 the American Institute of Stress (AIS). All rights reserved. All materials on AIS' website and in AIS' newsletters are the property of AIS and may not be copied, reproduced, sold, or distributed without permission. For permission, contact editor@stress.org. Liberal use of AIS fact sheets and news releases is allowable with attribution. Please use the following: "Reproduced from the American Institute of Stress website [or newsletter], © AIS [year]."

AIS Board of Directors

Chairman:

Paul J. Rosch, MD, FACP

President:

Daniel L. Kirsch, PhD, DAAPM, FAIS

Distinguished Members:

Robert Bisaccia

Holger Wrede, Esq.

Tracey B. Kirsch

\$TRESS\$



by Paul J. Rosch, MD, FACP
Editor-in-Chief

Americans have always had an inordinate thirst for health information, especially any news about how to lose weight, prevent heart attacks, or live longer. In recent years, the spotlight has been on stress, not only because reducing stress has been shown to be effective in all of the above, but a host of other disorders. *Huffington Post* now features articles on stress several times a week and websites, organizations and companies devoted to depression, sleep disturbances, pain and other stress related disorders also provide periodic news releases about advances in these areas.

Google issues a daily "stress alert" or "stress medicine journal" and on October 15 there were two. Included among their more than 30 headlines were the following dozen:

Mindfulness-Based Stress Reduction Helps Lower Blood Pressure

The Executive Stress Myth: Why Everyone's Missing The Point

The Cost of Stress: 3 Things Every Company Should Know

Stress-Induced Depression In New Moms Extends To Daughters

Stress in Middle Age Could Increase Alzheimer's Risk

Less-Stress Airline Tickets

Reduce Stress Of Breast Cancer Diagnosis With Yoga

Dr. Z Erases Myths And Reduces Stress

Stress-busting Android apps

DON'T LET STRESS OVERWHELM YOU!

Ghrelin, A Stress-Induced Hormone, Primes The Brain For PTSD

Scientists Bank on Stress-Health Link

All The News That's Fit To Sell

All of the above headlines appear to offer something educational but are primarily promotional because this ploy has proven to be so profitable. When Adolph Ochs acquired *The New York Times* in 1896, he adopted the slogan "All The News That's Fit To Print" and insisted on articles that adhered to that promise. This was to distinguish it from the "yellow journalism" of competitors who used sensational "eye popping" but meaningless headlines to boost circulation. Despite a shortage of capital, Ochs also refused advertisements that he con-

sidered dishonest or in poor taste. That motto still persists in the upper left hand corner of the first page and has been adapted on its website to "All the News That's Fit to Click." *The New York Times* quickly became the gold standard for U.S. newspapers and the most trusted news organization in America.

All of that has changed dramatically as fast breaking events all over the world as well as locally are now immediately available on radio, the Internet and television. But we are inundated with so much information, that whether a story appears in print or on TV currently depends on who is interested, its value to advertisers, the cost of getting accurate reports and assembling the details. There is also much more competition, especially for medical news that can be slanted to promote a particular drug, device or service. The reason stress is grabbing headlines is not that everyone seems to be interested in it, but that it has become a gold mine for advertisers and others skilled at converting news items into sales pitches. I came to this conclusion after looking into some of the above headlines, such as :

*Scientists Bank on
Stress-Health Link*

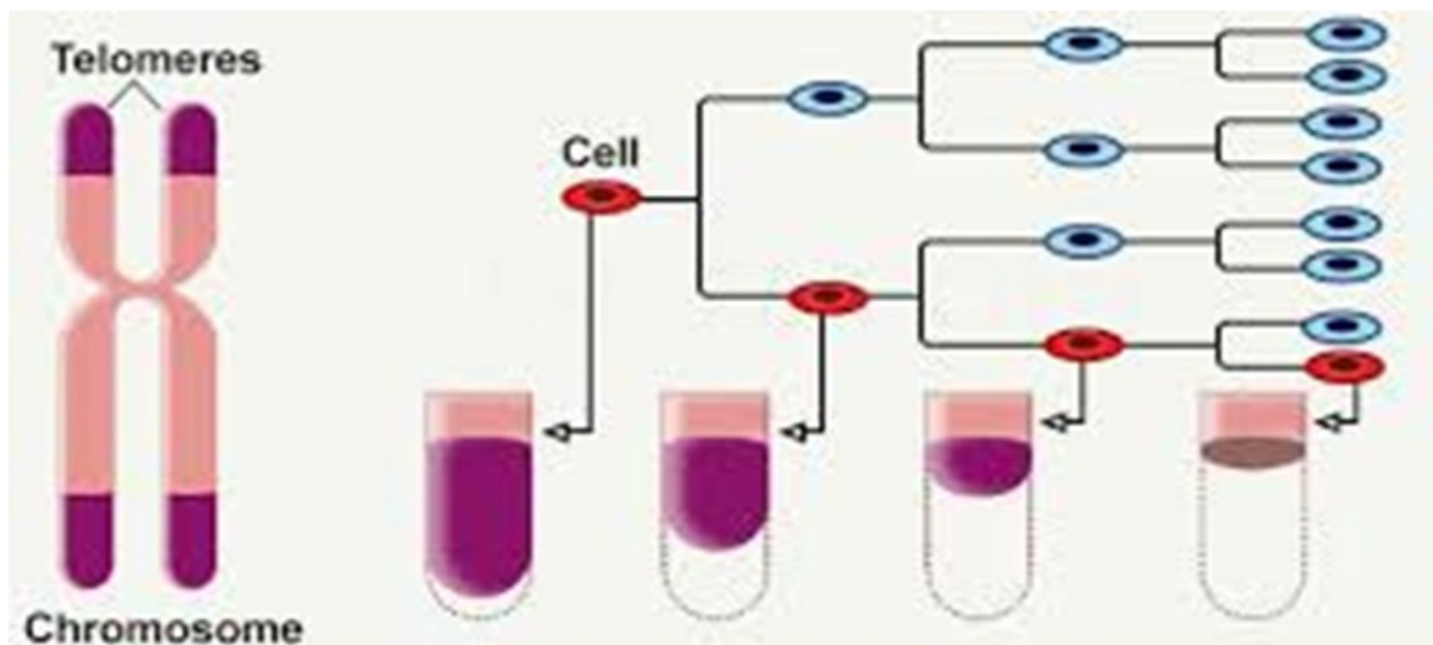
Clicking on this reproduced a *Wall Street Journal* article about how "Researchers at the University of California, San Francisco, have been at the forefront of an emerging medical field that seeks to identify and help treat problems caused by stress." It was based on the research of Dr. Elizabeth Blackburn, who shared a 2009 Nobel Prize "for the discovery of how chromosomes are protected by telomeres and

the enzyme telomerase". As noted in previous issues of Health and Stress, telomeres are protective shields at the end of chromosomes that prevent them from fraying during cell division, much like plastic tips safeguard the ends of shoelaces. Every time a cell divides, its chromosomes cannot be copied to their full length, much like a tape recorder is unable to play the first and last part of a cassette tape. As a result, the copy of the chromosome is incomplete and after repeated divisions, progressive telomere erosion causes cellular dysfunction and death.

Telomerase is an enzyme that regenerates telomeres and prevents their shortening. When a cell divides, half of the telomere goes with the newly cloned cell and half stays with the parent. Some cells have longer telomeres than others, but eventually telomeres become so short they cannot divide into two. Most cells can only divide 52 times, which is why telomerase becomes depleted as we grow older. Shorter telomeres have been

associated with an increased incidence of osteoporosis, depression, dementia, cognitive disturbances, insulin resistance, diabetes and other age related diseases. Blackburn and her group showed that cancer cells produce more telomerase, which could explain why they keep reproducing. This has led to speculation that anti-telomerase drugs might help in treatment.

The article focused on Blackburn's research demonstrating how *stress speeds up the loss of telomeres by reducing telomerase*. Mothers caring for very sick children have shorter telomeres when they report that their emotional stress is highest. Shorter telomeres were also found in family Alzheimer's caregivers that was associated with reduced immune system resistance to disease. Others have confirmed this and also reported that these changes persisted even after their caregiving activities ceased. Stress has long been known to accelerate aging and impair immune system function, and this may be due to higher levels of corti-

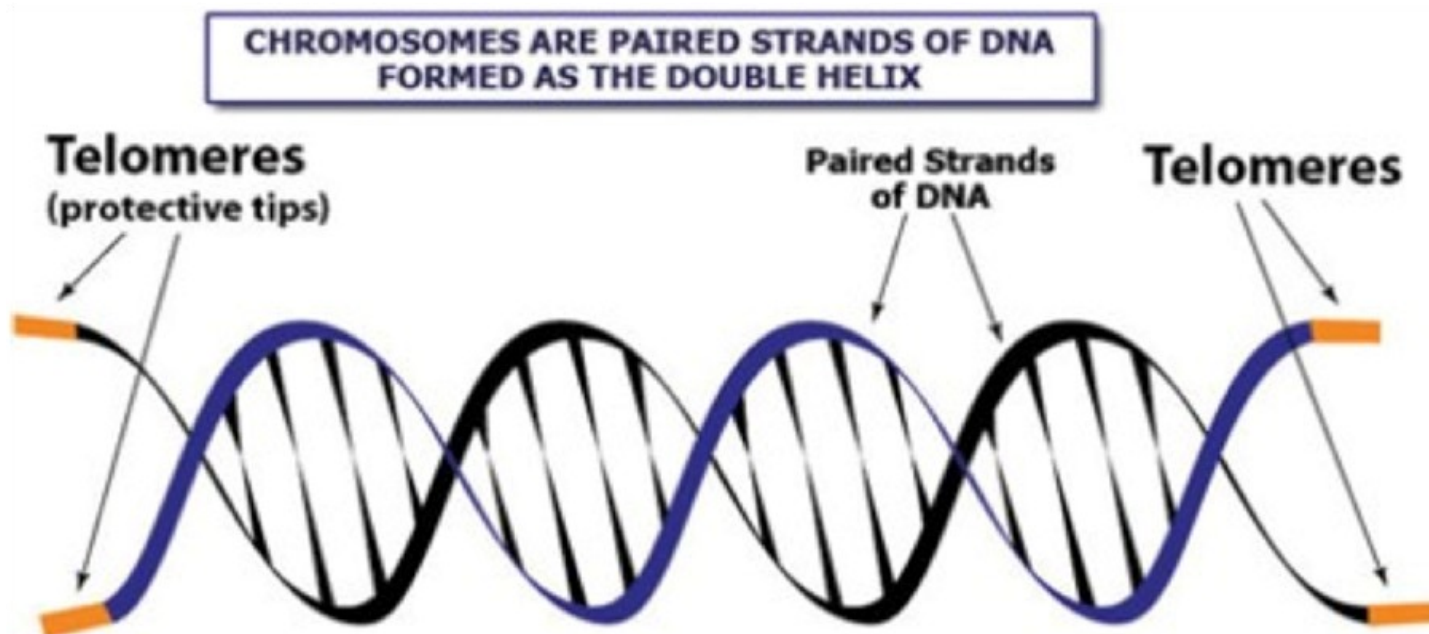


sol, a hormone that suppresses the ability of immune system cells to activate telomerase. In contrast, meditation that reduced stress increased telomerase. The purpose of the article was to announce that Blackburn was launching Telome Health, a new company that "would market their findings to physicians in the form of a test that can act as a personal report card on patients' health." As she explained, *"The science is there, and the time is right to bring it to the public. We see a big market opportunity for this."* The company's interim CEO said physicians could request the \$200 test for certain patients but that they planned to make it available to the public in the very near future.

I found this informative, but hardly news, since *it appeared in the March 17, 2011 Wall St. Journal as an update of a previous article.* Since nothing that had occurred since then was mentioned, why was it included along the other current news headlines? The

only justification appeared to be to encourage readers to go to www.telomehealth.com, the company website. This proved to be quite revealing since it immediately encouraged them to register to learn how to obtain the test. Although elsewhere in the site it states that individual testing will be "Coming in 2012" it is still not available except to certain researchers and physicians. There is an excellent FAQ section that provides accurate answers to emphasize that the test will not tell you how long you will live or whether you are more likely to develop a specific disease, but rather how you compare with age and sex matched controls. With respect to advice on how to live longer by preventing telomere shortening, the only suggestions are to avoid stress, stop smoking, exercise more, and follow a nutritious diet that includes antioxidants and omega-3 fatty acids, which are also available as supplements.

There is nothing new about this



either, so what good is the test if it simply shows you have short telomeres but not what is causing it or what you can do to prevent or correct it? In trying to find answers to this elsewhere, I learned that [one study](#) of 143 people 60 years and older found that those with shorter telomeres were almost twice as likely to die in the next 20 years as those with longer ones. In [another](#) that followed 787 healthy 40 to 60-year-olds, those with the shortest telomeres had three times the risk of developing some type of cancer over the next 10 years as those with the longest telomeres. But not all studies have found such strong correlations, nor do they prove that short telomeres are the cause of these problems. As a result, testing might do more harm than good. Healthy people would be subjected to the constant severe stress of having a sword of Damocles hanging over them, but not knowing when or where it would strike.

The test has also been criticized by Johns Hopkins geneticist Carol Greider, who shared the Nobel Prize with Blackburn for telomere research. As she pointed out in an interview, *"Save for the 1% whose telomeres are spectacularly short and have a family history of bone marrow failure or pulmonary fibrosis, we don't know for any individual what this would mean. There are no clinical studies that tell us anything about the other 99%. A given telomere length can be from a 20-year-old or a 70-year-old. You could send me a DNA sample and I couldn't tell you how old that person is. The science really isn't there to tell us what the consequences are of your telomere length."* Others

are concerned that insurance companies could use test results to set rates or deny coverage. In addition, there are different methods of measuring telomere length with no universal consensus on which is best. In addition to blood, saliva can be used to measure telomere length in white cells, but these results may not apply to telomeres of other cells in the body. None of the above was mentioned in the 2011 *Wall Street Journal* article. However, it did note that telomere testing was also available from Repeat Diagnostics, a Canadian company, so I decided to visit their website.

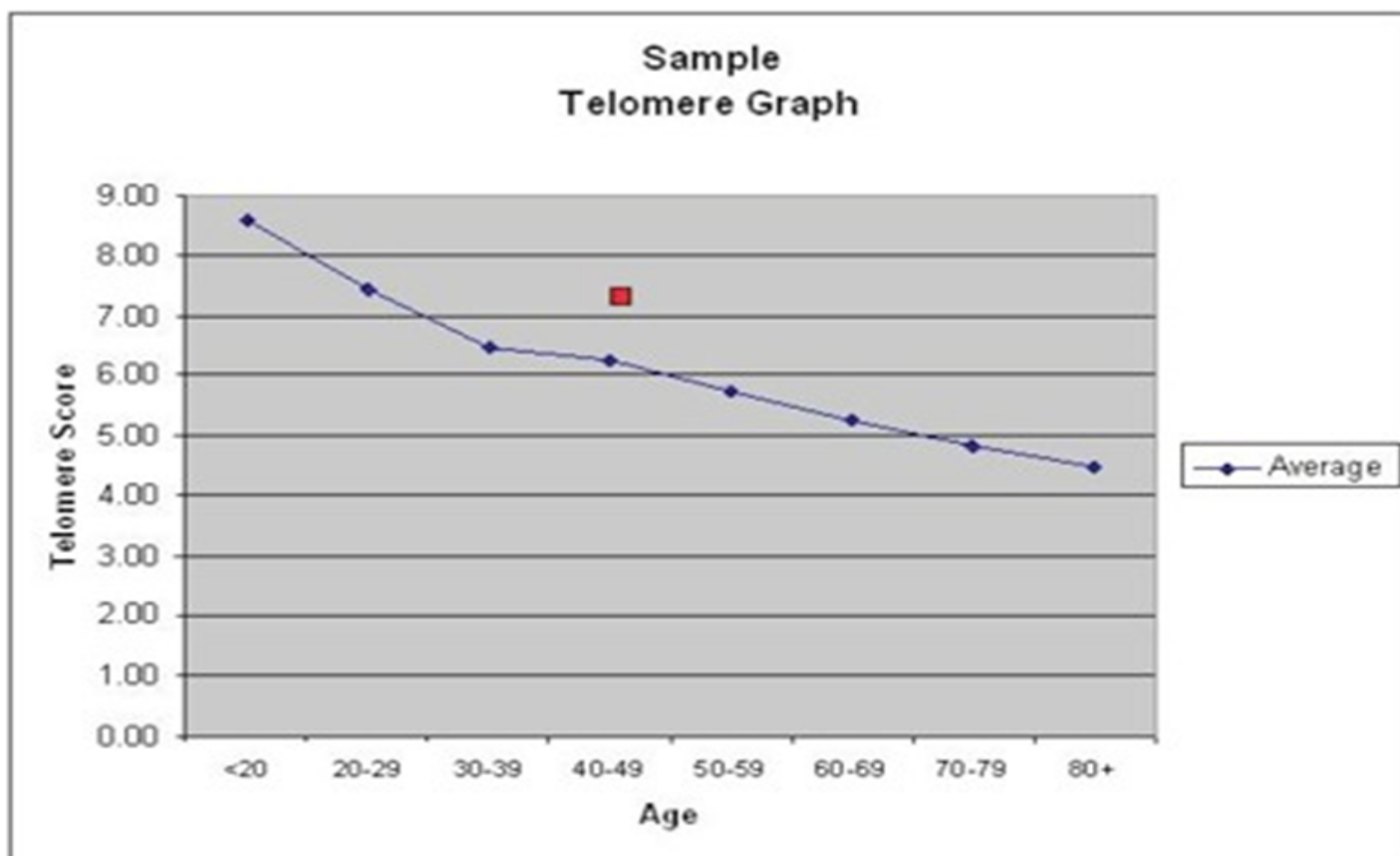
Repeat Diagnostics www.repeatdiagnostics.com was founded in 2005 as a spin-off of the government-run British Columbia Cancer Agency Research Centre in Vancouver. It offers a variety of tests for doctors and health professionals interested in telomeres, but not to the public. It uses a proprietary technique developed by [Dr. Peter Landsdorp](#) that is claimed to be superior to others because it provides multi-cell type information on telomere length. It is particularly useful as a screening tool for bone marrow donors. A 2-Panel Assay for lymphocyte and granulocyte white cells costs \$400 and a 6-Panel Assay, which includes these as well as immune system B-cells, T-cells and NK cells costs \$800. A consultation or analysis by a hematopathologist can be obtained for \$250. Each of these services has a specific CPT code and is partially reimbursed by insurance companies and fiscal intermediaries. This proved to be so interesting, that I was curious about other possible competitors, and obtained the fol-

lowing eye opening information.

SpectraCell Laboratories, Inc. www.spectracell.com located in Houston, TX was established in 1993 to provide testing for micronutrients. Its nutritional profile can measure 33 vitamins, minerals, amino acids and antioxidants to see if you have any deficiencies or imbalances. According to videos on the website, you can learn how to change your diet or take supplements to lose weight without dieting, and tests are covered by insurance companies. Cardiovascular testing provides lipoprotein particle analysis to measure the size and type of your LDL and HDL bad and good cholesterol particles to more accurately determine risk for a heart attack, whether you are

likely to develop metabolic syndrome, and the best way to correct any abnormalities. SpectraCell offered the first commercially available telomere analysis in the U.S., which costs \$290 and the results are presented as The Patient Telomere Score. This is also calculated based on the patient's average telomere length in white blood cells. The results are compared to telomere lengths from a sample of controls the same age and sex to determine the patient's percentile score as shown below.

Life Length www.lifelength.com was founded in 2010 to provide telomere testing to pharmaceutical and biotech companies for R&D and clinical trials, as well as researchers, physicians and the general public. It claims to be *"the only company in the world able to measure the percentage of short te-*



lomes in individual cells, which is the relevant indicator of cellular aging, rather than mean telomere length." The reason for this is that Life Length has an exclusive license to exploit the proprietary Telomere Analysis Technology (TAT) developed by Dr. [Maria Blasco](#), who has excellent credentials. She became interested in telomeres while working in Dr. Carol Greider's laboratory in Cold Spring Harbor, NY, was the first to demonstrate their anti-aging effects, and is now Director of the Spanish National Cancer Research Center. The company has a very distinguished team of scientific advisors and its patented Telomapping telomere test is used by all American Cenegenics Centers, and has become increasingly popular in Europe.

TeloMe www.telome.com claims to be "the only company in the world offering saliva-based, direct-to-consumer telomere length testing." It was founded in 2010 by researchers involved in Harvard Medical School's Molecular Technology Group and Personal Genome Project, which has been collecting saliva samples since 2005. TeloMe offers a Basic Test for first-time users for \$149 that provides *"average telomere length and a measure of the shortest telomeres--a critical determinant of biological age."* Their Premium Test (\$299) is recommended for middle aged and older individuals. It measures the average lengths of thousands of individual telomeres, and the proportion of telomeres in the sample that would be considered abnormally short. If you want to upgrade your Basic Test to Premium, the cost is \$179 and a new saliva sample is not required. A discount is offered for multiple tests, and for \$49, you can bank your saliva for future

analysis. This is useful if you want to evaluate the efficacy of anti-aging products that work by increasing telomerase. I was interested in finding out more about this and learned that such a compound had initially been discovered by Geron Corporation but was now being marketed by TA Sciences. Further investigation revealed the following fascinating saga that is still ongoing.

Geron www.geron.com is a biotechnology company located in Menlo Park, CA with an interest in developing products that influence telomerase production. In 2006, they isolated an extract that increased telomere length by stimulating telomerase production. It was derived from the root of *Astragalus propinquus*, a flowering plant that had been used for thousands of years in traditional Chinese medicine to promote healing and reduce fatigue. Other supplements containing Astragalus are widely available and are taken to "increase resistance to stress and disease," but there is no standardization. Nor is there any proof to support these claims or evidence that they have any effect on telomerase. On the other hand, since these supplements are derived from a natural product, they are not within the jurisdiction of the FDA and the manufacturer can claim anything it chooses other than being effective for the treatment of a specific disease. And there is no guarantee that the contents of the container bear any relationship to what is stated on the label.

In contrast, the Geron extract was standardized with respect to potency, the effects on telomerase were modest but consistent and there were no safety problems in animals or humans. Although the company applied for a patent

on its extract, it was not interested in a non prescription supplement that might possibly be copied and it was licensed out to TA Sciences, a New York supplement company that sells it as TA-65®. Geron retained the rights to develop the extract into a new pharmaceutical that would be a more potent telomerase stimulator, but never followed through on this. Instead, they focused on finding a drug to treat cancer that did just the opposite. Cancer cells continue to divide because they keep making telomerase, and after numerous trials, Geron scientists synthesized a drug they labeled imetelstat, which was shown to be a specific and powerful telomerase inhibitor in experimental animals with malignancies. Preliminary studies in human breast, lung and brain cancers were disappointing but good results were obtained in hematologic disorders. One Phase 2 study in polycythemia vera has been completed, another on myelofibrosis is in progress and a study in multiple myeloma is planned.

TA Sciences www.tasciences.com, was founded by Neil Patton, who obtained the exclusive worldwide rights to TA-65® from Geron. He takes it himself and has done a masterful job of marketing it to physicians, researchers and the public here and abroad. The cost of treatment ranges from \$1,200 to \$4,000 for a 6-month supply depending on the dosage and capsule strength, which is determined by one of their affiliated physicians. The basic Patton protocol requires measurements of mean telomere length in lymphocyte and granulocyte white cells (\$800), critical immune function cells at UCLA's Immunology Lab (\$400) and extensive blood testing at Quest Di-

agnostics Labs consisting of over 80 specific procedures (\$890) or less depending on insurance and test locations.

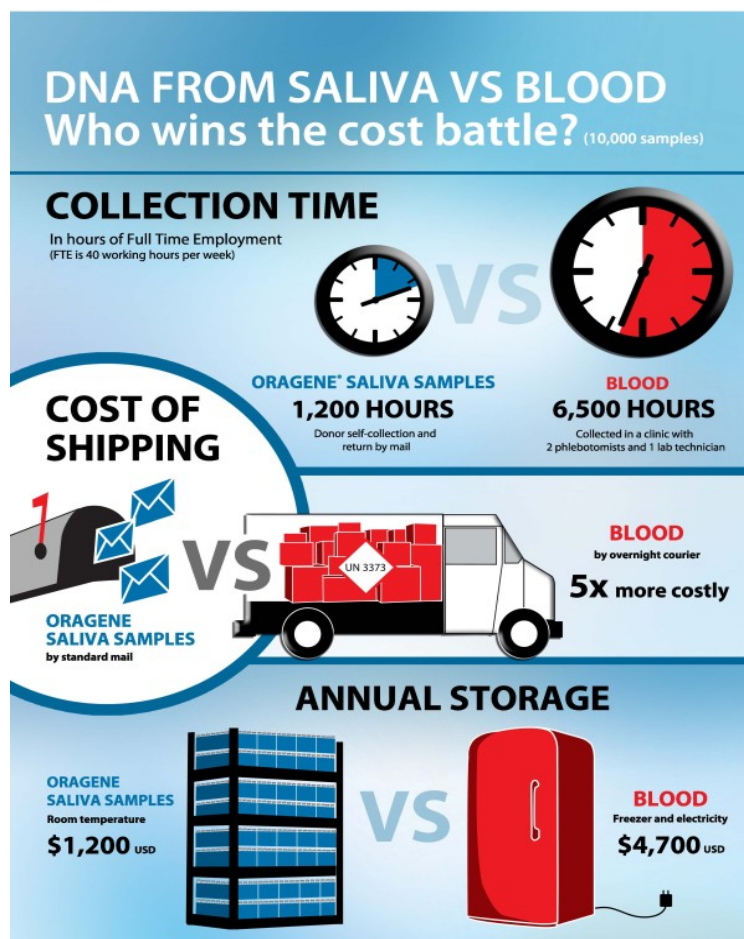
Patton's full protocol includes all of the above plus an evaluation of six biomarkers of aging: Vascular Age, Pulmonary Function, Cognitive Function, Vision, Skin Elasticity and Bone Density. After the test results are analyzed, a consultation with an affiliated age management expert physician trained in telomere biology normally takes place in the doctor's office, but can be conducted over the phone. The \$500 fee for this is paid directly to the doctor. If you choose to begin the full protocol at a daily dose of 1000 units, each 6-month segment costs \$6,000. Lab work and the doctor's consultation fee are not included. Several studies by eminent researchers appear to support reports of improvement by individuals on the basic protocol, suggesting that they are not placebo effects. Maria Blasco reported in a [2011 paper](#) that although mean telomere length did not increase; there was an impressive reduction in the percentage of short telomeres, which is considered to be more important. [Another authority](#) believes it can prevent HIV infection from progressing to AIDS. A study on patients following the basic Patton protocol for five years published in the [October 2013 issue](#) of *Rejuvenation Research* reported no adverse events from TA-65® by physicians licensed to sell the product in 7,000 person-years of use. Based on other results, the article concluded, "in addition to apparent positive immune remodeling, Patton Protocol-1 may improve markers of metabolic, bone, and cardiovascular health."

TA Sciences has revenues of \$6

million/year, but that is now threatened by a class-action lawsuit from Brian Egan, alleging that it engaged in deceptive business practices by promoting a proprietary herbal extract that reversed the effects of aging. Patton had employed Egan in 2011 to expand TA Sciences in foreign markets. According to Egan, he was required to take TA-65[®] twice a day, *"so that I could tell customers that I was also taking the product, and that it was safe and effective."* Four months later, he learned he had prostate cancer. When he informed Patton, he was told that this could ruin the company and he was fired the next day. Egan also stated he *"was offered a cash settlement to keep quiet about his cancer, but turned it down."* Patton denies this and his affidavit states that Egan was fired because of poor performance. Shortly after he was fired, Egan told a potential TA Sciences partner in Spain that he had developed cancer while taking the telomerase-activating supplement. Patton and TA Sciences then sued Egan for defamation, claiming that he lost the company \$2 million in sales and that the cancer had been present before his employment.

A few months later, Egan launched a broader attack with a class-action suit along with another man who took TA-65[®] that challenged the company's website claim that it lengthens short telomeres. Epidemiological studies have shown that short telomeres are a risk factor for atherosclerosis, diabetes, osteoporosis and Alzheimer's and this could be construed as implying the supplement could help prevent these and other diseases. According to an article in [Nature](#), when Carol Greider was asked for her opinion, she said she doubted that the supplement caused Egan's cancer but conceded that

the science behind it was murky. *"A telomere-lengthening compound would be a boon to patients dying of bone-marrow failure and pulmonary fibrosis and firms could be expected to explore its pharmaceutical potential. I don't think a company would be selling it on the side as a nutraceutical."* Other experts vigorously [deny it could cause cancer](#) and personally take and recommend it for family and friends because they believe it is perfectly safe and can extend life expectancy.



Banking On A Stress-Health Link And Testing Saliva Versus Blood

My odyssey uncovered other natural products that boost telomerase, such as Shoushen Granule, a Chinese medicine

that [increased telomerase and telomere length](#) in atherosclerotic laboratory animals. There were also other companies like Sierra Sciences www.sierrasci.com that screened more than 1,000 nutraceutical extracts and confirmed five that caused an increase in telomerase. It was founded in Reno, NV in 1999 by Dr. William H. Andrews, shortly after his team at Geron Corporation successfully discovered and cloned human telomerase. He left after Geron decided to focus on a telomerase inhibitor to treat cancer and, based on early experiments, wanted to market telomerase stimulators for use in dogs, cats and horses. Market research showed that pet owners would readily buy anything that might improve their health or extend their life, and for racehorses, improving their speed by a second could be worth thousands of dollars. However, Sierra Sciences suffered severe financial losses in the 2008 stock market crash and has been relatively inactive for the past 2 years.

Save for a sentence referring to Repeat Diagnostics in Canada as a possible competitor, there was no hint of any of the above in the 2011 *Wall Street Journal* article on the formation of Telome Health and Dr. Blackburn's stress research. I was still confused about why it had been included among current news items, until I looked at the complete headline more carefully.

Scientists Bank on Stress-Health Link UCSF Researchers Want to Market a DNA Test to Monitor Well-Being Over a Lifetime; The Push for Longer Telomeres

"Bank" is an interesting word that has several meanings as a noun, but usually

refers to a place where you can safely store things, especially money. It is used here as a verb that implies something you can rely on or trust to become profitable. The latter seems most likely since it goes on to explain that their goal is to sell a test that measures the length of telomeres. The only clue as to what this might be is a sentence indicating that Telome Health intends to accomplish this using samples of saliva rather than blood.

There was nothing further about this until a [2012 Press Release](#) stating, *"Telome Health Plans Launch of TeloTest,™ a Novel Wellness Biomarker Based on Telomere Length."* The test would be available in the first quarter of 2013 using a sample of saliva, which Dr. Blackburn had shown to be as accurate as a blood test. It also claims, *"Telome Health's TeloTest™ will be the first saliva-based telomere test available on the market."* An October 24, 2013 announcement now provides this update:

Telomere Diagnostics, Inc. (TDx), developer of the TeloTest™ diagnostic test that measures average telomere length in human cells from a saliva sample, announces that it has changed its corporate name from Telome Health, Inc. to Telomere Diagnostics Inc. For more information, go to www.telomereDx.com, www.telomerediagnostics.com or simply www.T-Dx.com

Clicking on these is the same as clicking on the old website except for a change in the title indicating the new name and a banner that again promises *"Individual Testing Coming in*

2013." However, there is still no mention of how salivary testing will be conducted or its estimated cost.

Many doubt that the TeloTest™ will prove to be profitable for several reasons. Saliva is easy to obtain, does not require a visit to the doctor and testing is less expensive. Because salivary DNA is derived from blood, it contains the same information about white cell telomeres. However, since saliva has few living cells, there is apt to be contamination with DNA from bacteria and degradation products, and only average telomere length can be measured. In contrast, blood contains many living cells with high quality DNA and also provides information on the percentage of short telomeres, which is a much better predictor of biological aging. Nor is this the *"first saliva-based telomere test available on the market,"* since as noted previously, Boston based TeloMe has been providing this for several years at a cost of \$149, you can bank a sample for \$49 to compare with future tests and there is a discount for multiple samples. TeloMe is careful to emphasize on its website that its tests are *"for personal informational and research purposes only, and results do not provide clinical results or diagnoses of diseases."* In addition, *"Our suite of collection, processing, and analysis technologies enable us to collect samples by mail and courier, then extract and test purified DNA directly from saliva, without interference from microbial DNA!"*

Laboratory tests usually do not require FDA approval, but it has started [cracking down on genetic tests](#) being offered directly to the public. Repeat Diagnostics only serves specific physicians, executives



How it works



STEP 1

Order your TeloMe test online

STEP 2

Receive our saliva-collection kit in the mail



STEP 3

Collect your saliva

STEP 4

Mail back your samples



STEP 5



at Telome Health (now Telomere Diagnostics) and Life Length say they will require a doctor to be involved in ordering tests. SpectraCell allows consumer requests. TeloMe deals directly with the public but provides a special saliva collection kit with very detailed instructions to minimize contamination with bacterial DNA and degradation products. FDA warning letters have been sent to other companies that test DNA directly to consumers. The Agency indicated it was aware of telomere tests but had not yet reached any conclusions.

All The News That's Not Fit To Print And What To Expect In The Future

The purpose of this Newsletter is to illustrate how headlines and articles about stress are frequently deceptive and distorted, and why this is often deliberate. I could have easily demonstrated this with others, such as "Ghrelin, A Stress-Induced Hormone, Primes The Brain For PTSD." It cited an [Oct. 15, 2013 paper](#) in *Molecular Psychiatry* entitled "A ghrelin-growth hormone axis drives stress-induced vulnerability to enhanced fear" done in rats. Ghrelin was hailed as the "hunger hormone" when it was discovered 12 years ago because levels progressively rise before eating and fall after a meal. Ghrelin is produced in the stomach and patients who have gastric bypass surgery have consistently low levels, which may explain why this procedure is the most effective way to treat grossly obese people who are 100 or more pounds overweight. Drug companies have been struggling ever since to develop products that suppress ghrelin or

block its effects, but none of these have resulted in weight loss.

Ghrelin is elevated during stress, and to evaluate this, rats were taught to fear a harmless but unusual tone that would cause them to suddenly freeze. Some rats reacted much more than others. The amygdala is a small almond shaped structure in the temporal lobe that has been called the fear center. Researchers reported that it produced large amounts of growth hormone that correlated with the degree of stress as assessed by this freezing response in rats. More importantly, they discovered that the secretion of growth hormone by the amygdala was controlled by ghrelin, which, although made in the stomach, circulates throughout the body including the brain. And when rats were given a drug to increase ghrelin blood levels they became more susceptible to fear than controls. Blocking the receptors on the cells that interact with ghrelin reduced fear.

Based on this, they concluded that ghrelin released during chronic stress makes the brain more susceptible to traumatic events and drugs that reduce ghrelin could protect soldiers at risk for PTSD. As the lead author suggested, *"Perhaps we could give people who are going to be deployed into an active combat zone a ghrelin vaccine before they go When you were deployed and exposed to the stress of combat, your ghrelin levels would go up and the vaccine would combat that. That's exciting because right now there's nothing given to people to prevent PTSD."* It's hard to believe that anyone would propose such a recommendation based on such flimsy evidence. But this is not surprising. The

financial return would be monumental since an estimated 250,000 service members who fought in Iraq and Afghanistan have PTSD. As emphasized in prior issues of Health and Stress, current treatment has been a disaster and many believe may be responsible for the escalating rates of suicide in veterans. Anything that could provide a scintilla of relief would be welcome, but a ghrelin vaccine offers more hype than hope at present.

"DON'T LET STRESS OVERWHELM YOU!" is another type of deceptive headline. The article begins with "The American Institute of Stress (AIS) estimates that between 75 to 90% of primary care physician visits are due to stress related complaints." Several paragraphs follow that discuss the sources of stress, symptoms and signs and the numerous diseases that stress can contribute to. Most readers will skim through these to learn what can be done to reduce stress, which is in the last two sentences as follows: "Youngevity's SupraLife brand offers D-Stress, a unique proprietary combination of vitamins and plant extracts to help support the body during periods of excessive stress. D-Stress is a synergistic blend of vitamins, minerals, and adaptogenic herbs designed to support and strengthen the body's natural defenses to stress." There is nothing wrong with this article and it is for the most part educational. But many people will read the first sentence and soon skip to the end and get the impression that The American Institute of Stress endorses this D-Stress concoction. Promotional pieces for some weight loss products similarly reference articles in prestigious journals by recognized authorities dem-

onstrating how stress can cause the deposition of abdominal fat, which then leads to diabetes and cardiovascular disease. These are immediately followed by claims that the supplement reduces stress to suggest that the distinguished experts cited vouch for the efficacy and safety of D-Stress.

To return to telomere testing, as the old adage goes, "You get what you pay for." Salivary procedures may be cheaper and easier to obtain than blood samples but do not provide as much meaningful information. In addition, even the most sophisticated blood tests don't indicate the status of telomeres in other tissues and organs, how long you will live or what you can do to promote longevity. In that regard, when it comes to current products like TA-65,[®] which promise "cell rejuvenation through telomerase activation" that "lengthens short telomeres, helps prevent DNA damage, rejuvenates aging immune systems" and uses "Nobel Technology" you do not get what you pay for. The current cost of \$600 for 90 250-unit capsules will last about three weeks at the recommended dose of 4/day. The active ingredient cannot be patented and is available elsewhere at a much lower price. You don't know the correct dosage or how it affects telomeres elsewhere in the body, and the possibility that it might stimulate the growth of cancer cells is also a deterrent. The answer to these questions may not be known for decades, and given our present state of ignorance, a competitive product that is more expensive may be even more popular for those of means since they are likely to assume it is superior because of the higher price.



Epigenetic Clock Heat Map (courtesy of Dr. Steve Horvath)

New developments may also make present testing procedures and telomerase boosters obsolete. A [just published study](#) by Dr. Steven Horvath found that there are biological clocks all over the body that explain why tissues age at different rates. The discovery was made by focusing on methylation, a naturally occurring process involved in the formation of DNA. It involved scrutinizing data on methylation in 8,000 samples of 51 types of healthy and malignant tissues and cells in the body. In order to determine how age affects DNA, he analyzed methylation levels from fetuses to age 101. When 20 different types of cancer tissue were

examined, he found that on average, it was "36 years older than one would expect based on chronological age. These results indicate that a tissue that looks much older than expected may be malignant." In addition, "Healthy breast tissue is about two to three years older than the rest of a woman's body. If a woman has breast cancer, the healthy tissue next to the tu-

mor is an average of 12 years older than the rest of her body."

As illustrated to the left, not all tissues age at the same rate, and female breast tissue ages at a faster rate than others. This may explain why breast cancer is the most common cancer in women and why many malignancies are age related in both men and women. As an accompanying news release noted, "While earlier biological clocks have been linked to saliva, hormones and telomeres, the new research is the first to result in the development of an age-predictive tool that uses a previously unknown time-keeping mechanism in

the body to accurately gauge the age of diverse human organs, tissues and cell types."

When interviewed about the significance of his findings, Horvath replied, *"The big picture is really that people who study aging were really limited in that they weren't able to accurately measure age. It has been a long-standing hope to develop aging clocks that allow us to access the age of a cell or a tissue. The purpose being to learn why we age and what can be done against it."* He acknowledged that while his isn't the first aging clock, measuring chemical changes to DNA has made it "far more accurate" than previous versions. He tested this by comparing a tissue's biological age to its chronological age and was *"thrilled — and a little stunned"* by its consistent correctness. *"It's surprising that one could develop a predictive tool that reliably keeps time across the human anatomy. My approach really compared apples and oranges, or in this case, very different parts of the body — including brain, heart, lungs, liver, kidney and cartilage."* While it is too soon to say, many believe this new approach will help cancer and stem cell researchers, as well as offer clues on how to slow the aging process.

As an old adage states, "Everyone wants to live long, but nobody wants to grow old." The belief in an elixir of life that could prevent aging, restore youth or confer immortality can be found in the oldest extant records from ancient cultures. *The Epic of Gilgamesh*, which describes a mythical Mesopotamian king's

quest for an eternal youthful life, is still preserved in eight clay cuneiform tablets estimated to be 4,500 years old. Early Chinese alchemists believed that long-lasting precious substances such as jade, and especially gold, would transfer their longevity and non-tarnishing properties to those who consumed them. Various ancient Greek, Egyptian and Chinese writings describing legendary figures who drank liquid gold, or "the white drops" to achieve immortality. According to some

"Everyone wants to live long, but nobody wants to grow old."

historians, Alexander the Great invaded India in 327 B.C. to search for a river of gold said to provide such rewards. (In more recent times, distilled "liquid gold" has become available as *uisge beatha* or "water of life", the Gaelic name for whiskey.)

Herodotus, the 5th century B.C. Greek historian, wrote of a fountain containing a very special kind of water located in the land of the Ethiopians that was responsible for their exceptional longevity. This is referred to in the *Quran*, which also describes the Zamzam Well near Mecca with similar powers that is

visited on pilgrimages to the holy city, required for all Muslims. Ponce de Léon searched for a Fountain of Youth in Florida and others sought similar rejuvenating springs and wells believed to exist in other parts of the world. Sir Isaac Newton and other medieval alchemists were pre-occupied with finding the "philosophers' stone," a substance that could not only transform base metals into gold, but was also an elixir of life with rejuvenation properties. The most famous alchemist was Paracelsus, a physician whose 1570 *De Tinctura Physicorum* described a tincture that would enable people to live for centuries without appearing to age. Immortality, restoration of youth or retarding aging were recurrent themes in Christopher Marlowe's, *The Tragedy of Dr. Faustus*, Oscar Wilde's, *The Picture of Dorian Gray* and the Shangri-La in James Hilton's *Lost Horizon*. Other anti-aging attempts that have been popular over the years include goat testicle transplants, elixirs of jade, inhaling the breath of

virgins, injecting crushed dog gonads, implanting monkey glands, fetal sheep cells and drinking radioactive waters.

More recently, anti-cancer as well as anti-aging benefits have also been claimed for resveratrol, Coenzyme Q10 (CoQ10), aspirin, carnitine, fish oil, tur-

meric, human growth hormone (HGH) and various combinations of these. But if a readily accessible elixir of life were to be found, the resulting population explosion would quickly exhaust our food and energy resources. And if it were only available to a limited number of individuals, how would you choose the recipients? Fortunately, this is not a problem we are likely to face in the foreseeable future. In addition,

as someone wisely noted, "Millions long for immortality who do not know what to do with themselves on a rainy Sunday afternoon."

Paul J. Rosch, MD, FACP



Antique French Mirror Cover between circa 1330 and circa 1340

This ivory plaque was originally the back for a disk-shaped mirror of polished metal. It is carved with a scene of the Fountain of Youth. Elderly men and women walk or travel by cart from the left to the mythical Fountain of Youth at the right. They bathe and re-emerge as young couples who enter into the castle at the center and court above upon the battlements. The frame, a circle within a square, has four crouched dragon-like creatures in each corner.

A Special Thank You To Our Donors

Rosch Circle

(Benefactor's Society)
gifts of \$25,000 and up

Electromedical Products Intl. Inc.

Dan and Tracey Kirsch

Kirsch Circle

(Benefactor's Society)
gifts of \$15,000 to \$24,999

MonaVie Corp.

Guarantor

(Benefactor's Society)
gifts of \$10,000 to \$14,999

Sustainer

(Founder's Society)
gifts of \$5,000 to \$9,999

Pacesetter

(Founder's Society)
gifts of \$2,500 to \$4,999

Heidi Hanna, PhD, FAIS

Patron

gifts of \$1,500 to \$2,499

Friends

gifts up to \$1,500

Institute of Heart Math

**Admiral Stephen Barchet, MD,
FACOG, CPE, FACPE, FAIS**

In Kind Donations

**COL. (Ret) Kathy Platoni, PsyD
CPT. Alison Lighthall, RN, FAIS**

We hope you will join us in supporting, strengthening and sustaining the operations of The American Institute of Stress.

Please consider AIS as you plan your holiday giving this year.

Your gift sends an important message to other community benefactors that our members are fully invested in the AIS mission. Your donation speaks volumes about the enthusiasm you have for our mission at AIS.

GET INSIDE OUR HEAD

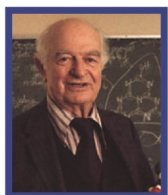
It's Not Our Credentials
That Make AIS So Impressive,
It's the Fellows That Go with Them.



The American Institute of Stress is a non-profit organization established in 1978 at the request of Dr. Hans Selye (the Founder of the Stress Concept) to serve as a clearinghouse for information on all stress related subjects. AIS Founding Fellows include:



Paul Rosch



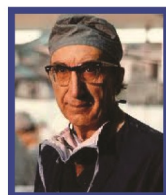
Linus Pauling



Alvin Toffler



Bob Hope



Michael DeBakey



Herbert Benson



Charles Spielberger

Join our prominent psychologists, physicians, other health care practitioners and health conscious individuals who are interested in exploring the multitudinous and varied effects of stress on our health and quality of life.

The American Institute of Stress invites YOU to enhance your credentials with FAIS and add your name to our Gallery of Distinguished Fellows.

Over the last 35 years, we've expanded our services and broadened our reach, but our dedication to science hasn't changed a bit.

Our four focus areas include:

1. Combat Stress
2. Daily Life Stress
3. Workplace Stress
4. Expanding Human Potential

We produce three e-magazines focused on different stress related topics...



We are always looking for new contributors to our magazines. If you would like to submit an article, email your idea to editor@stress.org

Join us in our mission to
Engage, Educate and Empower
the global community with science based stress management information, tools and techniques so people can live happier, healthier and longer lives!

Visit stress.org to download your
FAIS or DAIS application

The American Institute of Stress

This is to certify that

Imagine YOUR Name Here

Having satisfied the requirements for education, training and experience,

is duly qualified and has been elected to the status of

Fellow of the American Institute of Stress

and is entitled to all of the benefits deriving therefrom



Member Number: 5001
Expires: June 12, 2013

Daniel L. Kirsch
Daniel L. Kirsch, PhD, DAAPM, FAIS
President

American Institute of Stress
9112 Camp Bowie West Blvd. #228
Fort Worth, TX 76116

www.stress.org

USA Main: (682) 239-6823
Fax: (817) 394-0593
Email: info@stress.org

Want more AIS news delivered to your inbox?

Click Here



Subscribe Now
FREE



The American Institute of Stress
9112 Camp Bowie West Blvd. #228
Fort Worth, Texas 76116 USA

Phone 682.239.6823
Fax 817.394.0593
info@stress.org
www.stress.org

ISSN # 108-148X