

Are you Dying in the Dark?

Improve your health, extend your life and lighten your mood!

Introduction and Overview of ***Embrace the Sun***

by Marc Sorenson, Ed.D. and William Grant, Ph.D.

Foreword

Michael F. Holick, Ph.D., M.D.

Marc Sorenson and Bill Grant take us on a delightful journey to better understand the health benefits of our magnificent sun at a time when our sun has been demonized by various health organizations, including the dermatology community, which has been essentially unchallenged for the past 50 years. As noted by the authors, the world-wide sun phobia is based on the misconception that any exposure to direct sunlight increases the risk of developing the most common cancer, i.e., skin cancer. However, the most common skin cancer, non-melanoma skin cancer, is caused by chronic excessive exposure to sunlight. These cancers when detected early are easy to treat and are often cured. The most deadly skin cancer, melanoma, occurs on the least sun-exposed areas and the authors present compelling evidence that regular or habitual sun exposure impedes or prevents the development of this highly malignant cancer rather than causing it. What is true about melanoma is that major risk factors include being red headed, thus having fair skin and being prone to sun burning, number of sun-burning experiences during childhood and early adulthood, number of moles on the body, and a genetic predisposition for developing this malignancy.

The authors put into perspective the voluminous research over the past Century relating the many negative health consequences associated with sun avoidance, or to put in another way, to remarkable health benefits from sensible sun exposure. In the early 1900s it was first observed that indoor workers were at much higher risk of dying of cancer compared to outdoor workers. This was followed by a study by Apperly reporting that adults living at higher latitudes in the United States had a much higher risk for dying of cancer than adults who live in the southern states. A study in Canada reported that women who had the most sun exposure as teenagers and young adults reduced their risk of developing breast cancer by almost 70% when compared to women who had minimum exposure during these periods of time in their lives. It's also recognized that autoimmune disorders including multiple sclerosis, type-one diabetes, rheumatoid arthritis and Crohn's disease are much less common for those who are born and live closer to the equator. Those living at lower latitudes have not only lower blood pressure but also are at reduced risk for developing a heart attack. At the turn of the last Century tuberculosis was a major killer of children and adults. It was found that exposure to sunlight could help fight the infection. Solariums and outdoor treatment centers were established to help fight this deadly infectious disease. Finsen in 1903 received the Nobel Prize in Medicine for his observation that when the skin that was infected with tuberculosis was exposed to sunlight that it was effective in treating this disorder.

How is it that exposure to the sun can have all of these health benefits? Dr. Sorenson and Dr. Grant acknowledge that the well-documented beneficial effect from exposure to sunlight is the

cutaneous production of vitamin D. They also describe in detail various mechanisms by which vitamin D can have such global health benefits in reducing risk for more than 50 chronic illnesses including approximately 18 major cancers including melanoma. Sun deprivation and vitamin D deficiency have also been associated with not only depression but also neurocognitive decline in older adults with increased risk for developing Alzheimer's disease.

But this is only part of the story of the health benefits from sun exposure. They explain how the sun is able to elicit a wide variety of photochemical and biologic processes in the skin that provide additional health benefits above and beyond the beneficial effects provided by vitamin D. This is due to the fact that the sun is emitting packets of various energies including ultraviolet B, ultraviolet A, visible and infrared radiation. These packets of energy are absorbed in the skin cells causing a plethora of biologic effects. Of the many described in the book, most notable are the production of beta endorphin, which is responsible for improving the feeling of well-being and is also associated with the runners high, and nitric oxide, which is a natural skin product that when released during exposure to sunlight causes dilation of blood vessels, thereby reducing blood pressure.

The authors also nicely put into perspective what happens to the DNA in the skin when it absorbs ultraviolet A and ultraviolet B radiation and how the body develops repair mechanisms to help overcome these radiation insults. In other words, over millions of years, life forms including humans were exposed to sunlight and not only took advantage of the many health benefits, but they also adapted to the potential negative consequences by developing repair mechanisms to overcome the damaging effects from sensible sun exposure.

Embrace the Sun is an easy read that is chock-full of valuable information about the health benefits of sensible sun exposure. It provides a very practical guide on how to take advantage of our Magnificent Sun.

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Preface—Embracing the Sun

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The book touches every fiber within the matrix of human health, just as ubiquitous sunrays have touched the fabric of our complex existence since ancient times. **The sun's entire spectrum of irradiated wavelengths has enabled the development of all life on Earth, and life will be terminated without it.** The book's Appendix 6 proposes that the salubrious sun is "**the conductor in the symphony of living:**" Numerous crucial compounds are manufactured by our skin and brain in response to full spectrum visible, ultraviolet and infrared sunrays, all of which change in intensity throughout the day, causing various hormones, neurotransmitters, and immune messengers to crescendo and diminuendo-maintaining our metabolic harmony. The skin and brain are intimately interconnected since our earliest embryonic life, and together they orchestrate our responses to external stimuli. Solar energy, the initiator of life, is the most fundamental external stimulus, and the skin-the largest organ to absorb the entire spectrum of that energy-suddenly becomes an organ of great importance, once we understand the countless metabolic pathways stimulated within it whenever it is touched and penetrated by solar particles.

As a practitioner who has trained many physicians internationally to eliminate various skin lesions aesthetically and non-surgically, I have learned to appreciate the skin's most obvious functions and traits, but only in the last decade I've realized the skin's unique ability to keep us healthy, happy, and protected from disease, including skin cancer, with the indispensable assistance of the sun, as proven by science! Just read on to see for yourself. And if you're interested in the subject of skin cancer and skin health from a holistic, comprehensive, scientific perspective that will both surprise and empower you, just email clinic@ecopolitan.com to receive an article dedicated to the unorthodox skinny about skin growths and other skin conditions.

Whether you are a health seeker, scientist, layperson, academician, student, or doctor - you're embarking upon the most comprehensive and up-to-date scientific book ever written about the sun's health benefits. It's also the most holistic book about the sun. Dr. Sorenson and Dr. Grant have demonstrated their truth-seeking and pioneering spirit, and succeeded in restoring the sun to its ancient level of prominence as a resource for wellness and healing.

When my good friend Dr. Marc Sorenson introduced me to this new book and asked me to edit it scientifically and write a preface, I was intrigued, for two reasons:

First - the authors: **Marc Sorenson, Ed.D.** is an innovative educator, who has mastered the processes of teaching and learning; he is intimate with the necessity of repetition without excess, with the tools that sustain the reader's interest, and with the importance of attacking complex topics from multiple angles to successfully instill them in a student's mind. Marc truly embodies the term "doctor" -which derives from "teacher" in Latin. He has written several books, including a large compendium about general health and nutrition (*Mega Health*, 1993), written with wit and utilizing allegories and parables to penetrate the reader's mind; as well as a large book designed to enhance a person's vocabulary (*I Want to Have Words with You*, 2007), which is imbued with grace and humor, negating the drudgery and tedium we typically associate with memorizing word lists. To Dr. Sorenson, education is serious business! His descriptive, logically unfolding style creates a memorable educational experience. **William B Grant, PhD** is also a friend I greatly admire: For many years he has been swimming indefatigably and courageously against the mainstream's current perceptions of proper nutrition, diet, and vitamin D. As a scientist among scientists, he stands out for his original research and numerous contributions to our knowledge about vitamin D's benefits. His additions to the book elevate its scientific standing.

I am honored to support Marc and Bill's educational efforts.

Second, the book's topic resonated with my scientific respect toward Nature's complexity. Marc's excellent previous book, *Vitamin D3 and Solar Power for Optimal Health (2008)*, described vitamin D's benefits as a photoproduct of solar UVB exposure. It focused on the recent progress within academic circles, documenting vitamin D's incredible importance to our health. Yet, those circles may have relegated the sun itself, despite its temporal primacy, to a secondary entity whose main job is the production of vitamin D3 within the skin's epidermis.

This oversimplification might create the impression that vitamin D supplements equate with natural sun exposure and can replace it!

The study of nutrition has taught us to be humble: Nature is too complex and its myriad components too interrelated for any human to fully comprehend its nuances. A big mistake made by scientists has been the reductionist approach to natural systems, whereby a single element was isolated, synthesized, and sold as a replacement for the "real thing." Vitamin C, beta carotene, d-alpha-tocopherol, and other vitamins are all examples of this oversimplification of Nature: It took many years before we realized that all the bioflavonoids escorting vitamin C; all the other carotenoids; and all the isomers of vitamin E are crucial to health. Thus, they cannot be ignored to appease the vitamin manufacturers and scientists who have isolated just one of each family of nutrients, given it a name, and promoted it. Until we realized our errors and learned to respect Nature's complexity, we were bewildered by the inconsistencies in the performance of these single molecules. Today, vitamin D joins these isolated nutrients: The "Vitamin D decade"—that served as a catapult propelling us toward recognizing the importance of ultraviolet B radiation to health—is now giving way to the "solar decade." Soon we will all realize that isolating vitamin D for the purpose of "sun

supplementation" can only benefit those who are D-deficient, and that the holistic approach is far more scientific: Enjoying the entire spectrum of solar radiation gives us many exciting benefits that were stolen from us by the health authorities, which have been admonishing us to hide from the sun.

The book illuminates many of the crucial benefits we reap from the sun, above and beyond vitamin D production: Solar UVA, UVB and visible irradiation stimulates the release of cytokines (important immune modulators); it inhibits disorders associated with inflammation, thereby reducing the progression of most degenerative diseases; it supports cardiovascular health via nitric oxide release; and improves emotional and behavioral health by inducing serotonin and endorphin production. Full spectrum and infrared rays have always interacted with skin cells, triggering mitochondrial ATP (energy) production within them! Existence has evolved around the dance between the cycles of light and darkness – also known as the circadian rhythm. Our physiological pathways are intimately connected with the daily and seasonal changes in the composition and intensity of the solar spectrum: Sunrays – the eternal life givers – govern hormone secretion, libido, blood pressure, digestion, the immune response, sleep, mood, body temperature, and gene expression. When we obey nature's rhythm to obtain all the sun's "photo-nutrients" we can sleep better, cope more easily with stress, feel happier, and reduce the risk of most degenerative and life-threatening diseases. Our entire biology has been programmed to respond to the environmental cues of sunlight,

Embrace the Sun

Introduction and Overview

"Keep your face to the sun and you will never see the shadows."

—Helen Keller

Marc B. Sorenson, Ed.D.

The assault on the sun, which has increased in intensity for several decades, is one of the most heinous crimes yet perpetrated on humanity. It is another example of how humans—some misguided and others motivated by profit—often grasp a certain idea they believe will either protect the human race from a particular malady or produce a tidy profit. Unfortunately, by promulgating such ideas to the exclusion of all others, they cause a disruption of balance leading to death and destruction. The pendulum regarding sun exposure has swung so far to one side that many "health professionals" are now suggesting all people protect themselves completely from every single ray of sunlight and wear sunscreen all day, 365 days per year. This is, according to "balanced" scientists, contributing to the deaths of at least 336,000-400,000 Americans every year (references found in the main manuscript). The book will present the truth and thereby restore the balance for those suffering from the deception.

The sun has always been the giver of life. Unfortunately, an assault on the sun began many decades ago. Little by little, the myopic views of the anti-sun movement, which considered only the negatives of sun exposure, began to prevail, turning much of mankind against their friend, the sun. In the early 1900s sun exposure was considered very beneficial. Now, due to the money machine of sunscreen promoters, the sun has become "public-enemy number 1."

In 1936, sunscreens began to appear in the marketplace, which started the negative message regarding the sun, especially the portion of sunlight called ultraviolet light or UV light, which consists primarily of UVB and UVA spectra. But these chemical sunscreens blocked only the UVB portion of sunlight, the light responsible for vitamin D production; it did not block UVA light. UVB light also performs another important function: when the body has had enough sun exposure, it produces a feeling of heat on the skin, thereby warning us of the danger of overexposure. It tells us when to seek the shade.

Consequently, those who use sunscreen have been overexposed to UVA light by no fault of the sun. The sun gave us the perfect balance of light for good health, but mankind in his "wisdom" took that balance away. New research has shown that researchers were wrong in their theories, believing in the need to artificially control both UVB and UVA, **which is exactly what happens naturally when we seek the shade or cover up!** We never needed sunscreen to accomplish what nature guided us to do. It is interesting that the anti-sun argument, for decades, has become almost exclusively about skin health. This theory wholly neglected the myriad healthful

effects of sun exposure on other organs of the body, which benefits include, among others, cancer prevention, heart-disease prevention and mood enhancement. Now, the truth about the sun's healthful effects, including better skin health:

Did you know that as sunscreen sales have increased spectacularly, melanoma has also increased by about 3,000%? We must realize that the onslaught of advertising, designed to produce profits for sunscreen companies and their co-conspirators, have warped our perceptions. The health benefits of sun exposure are now well known among many scientists, but largely unknown for the general populace. The book will serve as a tool to take the truth to the world. The pendulum has swung too far to the negative, anti-sun side; we will now begin to bring it back to its rightful place, producing a balance, which will save millions of lives worldwide.

Sun exposure has profoundly decreased among the populace in the past century, while there has been an enormous increase in melanoma incidence. This fact alone should cause any rational person to rethink the message of sun avoidance. It also refutes the idea that humans should use sunscreen 365 days per year. This treatise will examine the aforementioned statements and accentuate this positive message: Sun exposure saves lives by preventing, mitigating and in many cases reversing diseases.

This is not another book on the benefits of vitamin D; that subject has been treated thoroughly by many authors and will continue to be researched. Nevertheless, vitamin D will often be mentioned, though little will be said about vitamin D supplementation. Supplementation detracts from the message that **sun exposure is superior to any of its photoproducts**. No one should erroneously assume, however, that this work is in any way meant to diminish vitamin D, since it is an exceptionally important photoproduct produced when the ultraviolet B (UVB) portion of sun exposure stimulates the skin. It is vital to human life, and when sunlight or sun lamps are not available to produce it, supplementation is a must, especially when a person is vitamin D deficient. Vitamin D supplementation can substitute for the vitamin D-producing aspect of sun exposure. However, there are additional health benefits of sun exposure that Vitamin D supplementation does not address, such as the production of nitric oxide, serotonin, endorphin and BDNF (a neuron growth factor and preventer of nerve death). Therefore, we have elected to omit reference to any studies regarding vitamin D supplementation.

As stated above, Vitamin D is certainly not the only beneficial photoproduct of the sun. However, there has been an unfortunate tendency for many writers and researchers to assume the only benefit of sun exposure is the production of vitamin D—an idea which is in error. We will expand upon the direct and remarkable benefits of sun exposure for various diseases and will consider other photoproducts, such as nitric oxide and endorphins, which are produced by human skin in response to sun—photoproducts that may reduce the risk of heart disease, cancer, multiple sclerosis, and myriad other disorders.

As an example, even erectile dysfunction may be relieved by nitric oxide.

Overview

In the first chapters of this work, we belie the idea that **regular or habitual** sun exposure is the cause of melanoma, and instead we present evidence that **regular or habitual** exposure impedes or prevents the development of that disease. In subsequent chapters, we will present the facts respecting other curative and preventive powers of the sun.

But first, to capture the reader's attention, we will present "headlines" which should have been written, based on overwhelming evidence from scientific research freely available to the world. We will then list many of the diseases associated with sun deprivation.

The Headlines:

Voluminous research in the past few years has proved the truth about the remarkable health benefits of the Sun. Why haven't you read these Headlines?

- Sun exposure in the U.S. has been reduced by 90% in the last 70-100 years, while the risk of melanoma has increased by at least 3,000%. Then how can anyone believe sun exposure causes melanoma?
- As in the US, while sun exposure in Europe has profoundly decreased, there has been a spectacular increase in melanoma.
- Many melanomas occur on the parts of the body that seldom or never see the sun, including inside and around sex organs, in the armpits, in the mouth, on the soles of the feet and on areas nearly always covered by clothing.
- Women who completely avoid the sun have an increased risk of breast cancer of 1,000%, compared to those regularly exposed to sun.
- Women in Spain who actively seek the sun have a reduced risk of hip fracture of 91%.
- Sunbathing can often reduce both systolic and diastolic blood pressure within an hour, and the effect lasts for about two more hours.
- Multiple Sclerosis is most prevalent in the northern part of the Northern hemisphere, but its prevalence virtually disappears in sunny equatorial climes.
- Selective serotonin reuptake inhibitors (SSRI) such as Prozac work by keeping serotonin in circulation. Sun exposure can increase the amount of serotonin in the circulation by 800% in one day without toxic side effects, and the sun is free.
- Regular, habitual sun exposure without sunscreens REDUCES the risk of melanoma.
- Outdoor workers obtain 3-10 times the annual sunlight exposure as indoor workers, yet they have lower incidences of melanoma. Why?

- Women with active sunbathing habits live longer.
- Women who avoid sun exposure have twice the risk of all-cause death over 20 years, compared to those who are actively in the sun.
- Chronic sun exposure is associated with a reduced risk of colorectal, breast, and prostate cancer.
- Regular exposure to UV leads to an almost complete disappearance of DNA damage where skin cancer has been initiated.
- There are 324 deaths associated with diseases of low sun exposure for every 1 death related to diseases of high sun exposure.
- UV radiation, from sunlight, is the best natural source of vitamin D. Vitamin D supplements alone are not an effective substitute for adequate sun exposure.
- Public health messages in the past 50 years, urging avoidance of sun exposure and the use of chemical sunscreens, have likely contributed to the rise in melanoma incidence.
- Chemical sunscreens have unbalanced Mother Nature, which is one reason why melanoma has INCREASED exponentially, accompanying the exponential increase in sunscreen sales during the past 30 years.
- DNA damage is reduced with a tan.
- Low blood levels of vitamin D are a major indicator of sunlight deficiency.
- If sunscreen is not re-applied every hour, it creates more skin damage than if one used nothing at all.
- Women who used sunbeds for 20 years had a 23% decrease in the risk for all-cause death.

To better understand the book, the reader should be familiarized with the different types of solar radiation:

Sunlight is the visible portion of the radiation emanating from the sun, with wave lengths extending from about 400 to 700 nanometers (a nanometer is one billionth of a meter). The invisible ultraviolet portion of the sun's radiation is called **ultraviolet radiation (UVR) or ultraviolet solar radiation** and is also known as **UV**. Its wavelength is shorter than the visible part of the sun spectrum and extends between 100 and 400 nanometers (nm), although solar UV reaching the earth's surface stops at 290 nm. That places it beyond the visual capacities of the human eye.

UVR is available year-round in the tropics and during part of the year farther north and south. UVR is also produced by artificial sources such as sunlamps, and phototherapy lamps. A photon

of light is the same no matter whether produced by the sun or an artificial source. This means there is no such thing as "artificial UV light"—a term you may often hear from the media.

To understand the history and function of the sun, one should know the differences between the types of ultraviolet light that are components of solar radiation. There are three main varieties of **UVR: UVA, UVB and UVC**. These are determined by wavelengths, measured in nanometers.

UVA has a wavelength of 315-400 nanometers and when contacting the skin can penetrate beyond the epidermis, or outer layer, into a deeper layer called the dermis. **UVA does not stimulate vitamin D production, but it does stimulate the production of nitric oxide**, which is vital for human health.

UVB has a wavelength of 280-315 nanometers, but solar UV reaching the earth's surface stops at 290 nm. UVB penetrates only the epidermis when it contacts the skin. **UVB stimulates the epidermis to produce vitamin D.**

UVC light has a wavelength of 100-280 nanometers and is filtered out by the Earth's outer atmosphere, including the ozone layer.

The following is a list of diseases and disorders diminished by regular, non-burning sun exposure:

- 18 Major types of cancer, (e.g. Melanoma, Prostate, more)
- Acute lower respiratory infection
- Anaphylaxis
- Anemia
- Anxiety
- Arthritis
- Asthma
- Athero-sclerosis
- Autoimmune diseases (e.g. MS)
- Bipolar disorder
- Breast-tissue density
- Chronic pain
- Cognitive decline
- Colds
- Craniotabes
- Crohn's disease
- Chronic obstructive pulmonary disease
- Cystic fibrosis
- Dental caries
- Eczema
- Electric light disease
- Epilepsy
- Erectile dysfunction
- Fibromyalgia
- Flu
- Heart disease
- Heart failure
- High Cholesterol
- Hypertension
- HIV/AIDS
- Compromised immune system
- Infectious mononucleosis
- Infertility
- Inflammation
- Inflammatory bowel disease
- Insomnia
- Intermittent claudication
- Kidney disease
- Leprosy
- Leukemia
- Low-back pain
- Metabolic syndrome
- Migraines
- Mood disorders
- Low muscle strength
- Multiple Myeloma
- Myopia
- Nursing home risk
- Obesity
- Osteoporosis and fractures
- Parasites
- Parkinson's disease
- Periodontal disease
- Peripheral artery disease
- Pre-eclampsia
- Psoriasis
- Rickets
- Schizophrenia
- Seasonal affective disorder (SAD)
- Sepsis, Septicemia
- Soft tissue injury
- Stroke
- Tuberculosis
- Ulcerative colitis

Vitamin D—a secondary focus of the book:

Please note: The term, "25(OH)D" refers to the circulating form of vitamin D, which has been created in the liver by converting either vitamin D produced in the skin by sunlight, or vitamin D from foods or supplements. It is also the form of vitamin D that is measured by standard vitamin D testing.

Our magnificent sun is a miraculous source of health for humans! It is the great healer and mood elevator, and can produce benefits in the physical, mental and psychological realms when used as God (or Nature, if you prefer) intended it.

There are many photoproducts produced in the human body due to sun exposure. Vitamin D is only one of those photoproducts. Although it is not the focus of the book, vitamin D is an exceptionally important product of sun exposure, and a short discussion of its relationship with the sun is in order.

Sunlight is the natural source of vitamin D, and it is the most important source. For most people, exposure of the skin to the sun provides approximately 90% of vitamin D production.²

Vitamin D from sunlight can be synthesized in the skin mostly around midday, from 10 am - 2pm, when the UV index is above 3 and the shadow of an object is shorter than its height. The UV index is a measure of the intensity of ultraviolet radiation B (UVB) from the sun, and is expressed as a number on a scale of 0-11, a higher number indicating a higher intensity. Exposure to the ultraviolet UVB portion of UVR is necessary to cause the skin to produce vitamin D.

When it comes to sun exposure, shorter exposures more frequently are best, and the more skin exposed, the greater the amount of vitamin D produced before burning. People should know their skin types to understand and determine how long they can be outside in direct sun before risking sunburn under different conditions.

Vitamin D produced in the skin from solar UVB exposure does not lead to vitamin D toxicity and is considered safe, as the body limits its own production.³ This is not true for vitamin D supplementation. However, when sun exposure is not available, supplementation will be necessary for those whose blood levels are deficient.

In the North American winter, due to the low angle of the sun, vitamin D cannot be produced through UVB sun exposure north of 35° latitude. The reason is that UVB rays are at an angle and are filtered out through the atmosphere. This is the same for the Southern winter, south of 35° latitude.

This also means you cannot produce vitamin D effectively during early morning or late afternoon/evening, even in summer or at low latitude locations (close to the equator) because the angle of the sun is too low at those times. The UVB rays should fall from a high angle and penetrate the atmosphere to reach earth (and your skin!). As stated, shadow length relative to height is the best way to determine if the angle of the sun is high enough. In addition, UVB does not penetrate glass;^{4, 5} therefore you cannot make vitamin D in your skin by exposing yourself to sunshine coming through windows.

According to the UK consensus statement, "Time required to make sufficient vitamin D varies according to a number of environmental, physical and personal factors, **but is typically short and less than the amount of time needed for skin to redden and burn.** Enjoying the sun safely, while taking care not to burn, can help to provide the benefits of vitamin D **without unduly raising the risk of skin cancer.**"⁶

Full-body UV exposure of 1 MED (minimal erythema dose), or the equivalent of being slightly pink 24 hours after exposure, will provide between 10,000 and 25,000 IU of vitamin D.⁷

The amount of exposure needed to achieve adequate vitamin D status depends on latitude, altitude, time of year and day, weather, other aspects of the environment, age, skin pigmentation type, clothing, activity, and the amount of skin irradiated.⁸

The surface area of skin exposed will influence the amount of vitamin D made after UVB sun exposure, and lying down exposes more skin than standing up.

Caveat

Now that we have presented information on vitamin D and sun exposure, we will add a caveat: Please do not conclude that just because vitamin D cannot be synthesized by the skin during winters, or during early morning or late afternoon, one should not try to obtain sunlight during those periods. The sun has marvelous effects at all times of day and at all seasons, and one should safely take advantage of it whenever it is available. **The complete book, we will cover extensively the benefits of sun exposure beyond vitamin D.**

What is a tan?

A tan, or natural photoprotection, is a darkening of the skin in response to sun exposure. The darker the skin, the more it absorbs light in the outer skin layer, and thereby protects the deeper layers. It is the body's natural response to sun exposure or other UV radiation such as that from tanning lamps. It is also the body's defense against skin damage. Tanning has been much maligned by those who want the population to avoid sunlight at all costs. Yet, a tan is highly protective against excessive sun exposure and subsequent DNA damage,⁹ especially when tanning is done regularly.^{10, 11} Tanning serves to acclimatize the skin to reduce risk of overexposure, but the inability to tan is a risk factor for skin cancer.¹²

About the Authors:

Marc B Sorenson. Ed.D.

Sunlightinstitute.org

Marc is a doctor of education (EdD) with a background in health. He and his wife, Vicki, founded one of the top health resorts in the world. During their 15 years at their health institute known as National Institute of Fitness, their clients lost approximately 110 tons of fat, two thirds of diabetic guests were free of medication in two weeks, and others recovered from high cholesterol, lupus, arthritis, migraines, hypertension, angina, arthritis, neuropathy, heart disease and allergies. The institute was ranked as one of the world's best destination spas and was featured in media throughout the U.S., and in Japan and Singapore.

His book Megahealth was a selection of the Literary Guild, Doubleday Book Club and Doubleday Health Book Club, where it was Book of the Month. He has also published several other books in the fields of health, human happiness, English vocabulary and vitamin D. He did meticulous research into hundreds of published papers on sunlight and health in order to write Vitamin D3 and Solar Power. It was published in the U.S. and in the Czech Republic and is now awaiting publication in Israel in Hebrew.

He was awarded the Money School of Boston recognition for Excellence in Nutrition writing—the only person so honored by the school.

He is a part-time professional speaker and has made presentations in many states in the U.S. and in cities in Japan, Canada, Mexico, and Italy. Dr. Sorenson has given more than 3,000 presentations on fitness, sunlight, nutrition and religion. His nutrition plan, like Dr. Grant's, is plant based.

He has appeared as a guest on many TV programs and has conducted his own radio show.

His hobbies include reading classic English literature and attending theater. His favorite activities include studying scripture, sunbathing, traveling with Vicki in Europe and Mexico, playing with the grandchildren and hiking on 13,000 foot Mount Wheeler near their Nevada ranch. He also enjoys entertaining his friends, such as Dr. Grant, at the ranch.

On the recommendation of Senator Orrin Hatch, a flag was flown over the United States Senate Building in honor of his contributions to the health and fitness of the citizens of the USA.

William B. Grant, Ph.D.

Sunlight, Nutrition and Health Research Center

Bill has a Ph.D. in physics from the University of California, Berkeley. He had a 30-year career in atmospheric sciences with an emphasis on laser remote sensing of atmospheric constituents such as ozone and aerosols. In the early 1990s, while living in Virginia, he led a project for the Sierra Club to determine the effect of acid rain and ozone on eastern U.S. hardwood forests. In that project he learned how to use the ecological approach, where populations are defined geographically and both health outcomes and risk-modifying factors are averaged for each population. He applied this approach in 1997 in a multi-country study in the seminal paper linking dietary factors such as fat and total calories to risk and cereals/grains and fish to reduced risk of Alzheimer's disease.

In 1999, after seeing the Atlas of Cancer Mortality Rates in the United States, 1950-94, U.S. National Cancer Institute, showing large geographical variations in cancer mortality rates, low for many types of cancer in the Southwest, high in the Northeast, he set about to try to explain the geographical variations. The seminal paper by the brothers Cedric and Frank Garland in 1980, proposing the UVB-vitamin D-cancer hypothesis based on the then map for colon cancer, provided the approach. The study raised the number of UVB/vitamin

D-sensitive types of cancer from five to 15 in a paper published in Cancer in 2002.

Dr. Grant retired from the NASA Langley Research Center in 2004 to pursue health studies full time, moving to San Francisco and forming the non-profit organization, Sunlight, Nutrition and Health Research Center (sunarc.org), for research and education regarding the roles of UVB, vitamin D, and diet in reducing the risk of chronic and infectious diseases. He has 260 publications on vitamin D listed at pubmed.gov, of which 93 also include ultraviolet exposure. He is a scientific advisor to GrassrootsHealth.net, VitaminDCouncil.org, and VitaminDSociety.org, and a frequent presenter at national and international vitamin D conferences.

He also has 36 papers on diet and chronic disease. His most recent papers on diet strengthened the evidence that animal products (meat, eggs, fish, and cheese and sometimes milk) are the most important dietary risk factors for many types of cancer as well as Alzheimer's disease. Based on his research on diet and chronic diseases, he strives to eat a whole-plant based diet with fish and some chicken. Due to limited solar UVB doses in San Francisco, he also takes vitamin D3 supplements to maintain his 25-hydroxyvitamin D concentration above 40 ng/mL, but also enjoys bird watching as a way to enjoy the out-of-doors and embrace the sun.