

Sun Care Decoded

**Answers to Questions
You Didn't Know to Ask**



By Michael J. Russ
with Peter Zahner

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Sun Care Decoded: Answers to Questions You Didn't Know to Ask, by Michael J. Russ

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www.SunCareDecoded.com

www.PureSunscreen.com

About Michael J. Russ

Michael J. Russ is an author, speaker, sun care expert, and founder of puresunscreen.com. He is a passionate advocate for using certified natural skin care and pursuing a healthy and energetic life. His credits include numerous radio interviews, blogs, and articles about natural sun care and how anyone can use basic life tools to transform their life to experience more happiness and fulfillment.

Michael currently owns and operates two companies. As an author, Michael has also written, produced, and published five other audio and eBooks, along with many articles that convey ideas, concepts, and techniques you can immediately employ to actively create the passion, love, optimism, happiness and success you deserve in your life.

Other book titles by Michael J. Russ (www.YourMutatio.com)

Powerful Sales: Manage Your Energy, Achieve Your Goals (audio book)

Powerful Self-talk: Change Your Self-Talk, Change Your Life (audio and eBook)

Design Your Life: Using Self-Talk to Design Your Life One Day at a Time (audio book)

Smart College Career Moves: What You Can Do Now to Make Yourself More Marketable Later (audio and eBook)

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Comments about Sun Care Decoded:

“The sun is the ultimate source of all life on Earth, and an important factor in human health in a variety of ways. This book is an excellent reference to help you best utilize this tool for maintaining your own optimal health and the health of our environment.”

-Ty Vincent, M.D., author of **Think Outside the Pill Box**

<http://astore.amazon.com/puresunscom-20/detail/147725515X>

*In **Sun Care Decoded**, Michael Russ elegantly explains the importance of sunlight, vitamin D, and balanced sunlight protection. Michael also teaches us about the dangerous toxicities and deficiencies caused by typical sunscreens. What you don't know can hurt you the most - trust Michael Russ will get you up to speed with information every human should know.*

Dr Peter Bongiorno, N.D., LAc, author of **How Come They're Happy and I'm Not?**

<http://www.innersourcehealth.com/DrPeter.aspx>

“Ultraviolet (UV) rays from the sun cause inflammation and damage of the skin cells by oxidation so it makes sense to use antioxidants to protect the skin. In addition, reflecting UV rays away from skin cells seems healthier to me than absorbing UV rays with chemicals.”

Gary R. Epler, M.D., author of **Fuel for Life: Level-10 Energy**,

<http://www.eplerhealth.com/>

“Finally, a concise to the point explanation about the truths of sunscreens. A must read for anyone concerned about skin protection” – Dr. Michelle Brown, JD AP

Introduction

For several decades, people with fair skin have sought a way to enjoy maximum time in the sun without suffering the damaging effects of overexposure. Although there is no dictionary definition for *sun care*, in our view, *sun care* encompasses the things you do to help prevent your skin from becoming damaged during sun exposure. The most immediate form of sun damage we seek to prevent is sun-stressed skin or sunburn.

Sunburn occurs during extensive sun exposure when skin is severely stressed by free radicals, also known as reactive oxygen species (ROS). Free radicals accumulate on your skin when it's exposed to direct and indirect (reflected) ultraviolet (UV) light. For a great number of people with fair skin, there are periods when preventing sunburn is a huge challenge. If you have medium to dark skin, your daily and long-term challenge isn't avoiding sunburn or sun damaged skin, it's making sure you get enough sun exposure to optimize your body's natural production of vitamin D. Vitamin D is an essential steroid hormone the body produces when your skin is exposed to ultraviolet light. As you will soon see, there are several distinct differences between the chemical and physical sunscreens available to you. Some are obvious, while others are very difficult to understand and spot. The most obvious difference is the way chemical and physical sunscreen active ingredients filter sunlight. This distinction will give you the greatest benefit, because it alleviates your confusion about what to look for when choosing a sunscreen.

We are not proponents of chemical sunscreen because we view their chemicals, and the way they function, as harmful to your body. Solid university studies have shown how chemical active ingredients used in sunscreens contribute to skin aging and non-melanoma skin cancer.

As you might have noticed, the largest share of the sunscreen market is chemical. Chemical sunscreens are inexpensive to produce, which translates into greater profitability. Confusion and paralysis is commonplace when people stand in from of the wall of sunscreen at their favorite store. In Australia, the highest SPF allowable for sale is 30. In EU countries, the maximum allowable SPF is 50+.

This book is our attempt to decode all things sun care, so you better understand sun care and sunscreen and are able to interact with sunlight in a

comprehensive way that is highly beneficial to your long-term health.

The topic of sun care is intricate and subjective. The information we provide is delivered in a question and answer format to allow you quick and easy access to accurate information in a way that is easily actionable. Many of the questions were submissions to our website from people seeking information to help them make the right sun care decisions.

We have attempted to severely limit the amount of technical language in an effort to help everyone understand this complex issue of sun care. Unfortunately, some of this language was absolutely necessary for information to be correct. We are not medical professionals, and we don't claim to be. Our mission is simple—put out the information and let you decide how you want to use it to maintain your overall health.

We fully intend to dispel a few time-honored sunscreen beliefs, as well as:

- Outline the root cause of the sun-stressed and sun-damaged skin.
- Reveal how easily sunscreen can compromise your immune system.
- Let you in on why a one-size-fits-all approach to sunscreen isn't for everyone.
- Present an effective sun care strategy that is safe and healthy for all skin types.
- Outline the what, when, how, where, and why of sunscreen use.
- Answer a host of questions about sun care you never thought to ask.

The sun is not something you should fear. It is a valuable resource that, when used with intention, can help you remain healthy. By intention, we mean actively engaging with the sun after fully understanding your body's tolerance or limits for sunlight. Each skin pigment has a unique tolerance and ability to tan. A tan is not a sign of skin damage. It is your skin's response (melanin production) to help protect itself from harsh UV light. Skin stress—pink to red and tender skin—is your skin's way of telling you it is losing the battle to protect itself and that additional actions need to be taken to ensure its skin cells don't incur further free radical damage.

We are passionate advocates for using only certified natural sun protection because evidence has clearly shown that traditional chemical sunscreen fails to perform in a way that supports your skin's natural ability to protect itself.

We also advocate that a lifelong sun protection plan should involve three pillars.

- Nutrition
- Certified natural antioxidant focused sunscreen
- Sun protective clothing

With these three pillars, you can rule the sun and your health.

For over 10 years, we have been actively involved in formulating and promoting MelanSol® Certified 100% Natural Skin Care. This book is a natural extension of our educational efforts. We hope it gives you more clarity about sun care and reveals our passion for helping you live a life filled with joy, passion, love, incredibly good health, and fun in the sun.

Chapter 1

Sunscreen Basics

Sunscreen is the number one way people protect their skin from overexposure while spending time in the sun. Because the issue of sunscreen is so complex and widely misunderstood, it's a great place to begin our dialogue.

Sunscreen has been around for so long and is so readily available that people simply assume it is safe and healthy. The cries to use sunscreen in order to prevent skin aging and skin cancer reach their highest level each summer, when people are most prone to overexpose themselves. If you use a high enough SPF, all will be fine, right? Not necessarily. The concept of sunscreen has many twists and turns that contradict decades of commonly accepted truths.

What is sunscreen?

Sunscreen is best defined as a lotion or oil that contains any combination of FDA-approved sunscreen *active ingredients*. These ingredients either absorb or reflect ultraviolet radiation when applied to the skin. The important words to remember here are *active ingredients*. The Food and Drug Administration (FDA) has approved the following 17 active ingredients for use in sunscreen. As you can see, each chemical active ingredient also goes by several other names as well.

<u>UV filter</u>	<u>Other Names</u>
p-Aminobenzoic acid	PABA
Padimate O	OD-PABA, octyldimethyl-PABA, σ -PABA
Phenylbenzimidazole sulfonic acid	Ensulizole, Eusolex 232, PBSA, Pars HS
Cinoxate	2-Ethoxyethyl p-methoxycinnamate

Dioxybenzone	Benzophenone-8
Oxybenzone	Benzophenone-3, Eusolex 4360, Escalol 567
Homosalate	Homomethyl salicylate, HMS
Menthyl anthranilate	Meradimate
Octocrylene	Eusolex OCR, 2-cyano-3, 3-diphenyl acrylic acid, 2-ethylhexyl ester
Octyl methoxycinnamate	Octinoxate, EMC, OMC, Ethylmethoxycinnamate, Escalol 557, ethylhexyl-paramethoxycinnamate, Parsol MCX
Octyl salicylate	Octisalate, 2-Ethylhexyl salicylate, Escalol 587
Sulisobenzone	2-Hydroxy-4-Methoxybenzophenone-sulfonic acid, 3-benzoyl-4-hydroxy-4-methoxybenzenesulfonic acid, Benzophenone-4, Escalol 577
Trolamine salicylate	Triethanolamine salicylate
Avobenzone	Butyl methoxy dibenzoylmethane, BMDBM, Parsol 1789, Eusolex 9020, Escalol 517
Ecamsule	Mexoryl SX, Terephthalylidene Dicamphor Sulfonic Acid
Zinc Oxide (ZnO)	
Titanium Dioxide	

*Approved in EU but not approved by FDA: Tinisorb M, Tinisorb S, Mexoryl

XL, Uvinul (T 150, A Plus), Uvasorb HEB, Parsol SLX

Factoid: All sunscreens are classified by the FDA as *over-the-counter drugs* because they have a medical function, not because they contain FDA-approved active ingredients.

Where did sunscreen come from?

In 1922, Karl Eilham Hausser reported that sunburn in human skin was caused by a certain part of the sun's ultraviolet spectrum, between 280 and 315 nanometers¹. Sunscreen active ingredients filter out the portion of the ultraviolet wavelength that stresses skin and causes sunburn. The first commercially produced sunscreen in the US used PABA, benzyl salicylate and benzyl cinnamate as active ingredients to absorb high percentages of the sun's ultraviolet light on the skin.

Eugene Schueller, the founder of L'Oreal, is credited with inventing the first commercially produced sunscreen in 1936. Schueller was soon followed in 1938 by Franz Greiter, who created Gletscher Crème' or Glacier Cream².

In 1944, Benjamin Greene patented a sunscreen called Red Pet Vet. His patents were later bought by Coppertone and sold under the *Coppertone Girl* and *Bain de Soleil* brand names.

Are there different forms of active ingredients?

Yes. There are two different forms of active ingredients—*chemical* and *physical* (naturally occurring). Each country in the world approves its own list of active ingredients, however, as the list of active ingredients above showed, the (FDA) has approved 17 active ingredients for use in sunscreen. Fifteen are chemical and two are physical (able to be naturally sourced). The FDA-approved physical active ingredients are *zinc oxide* and *titanium dioxide* and appear at the bottom of the list shown.

What part does the FDA play with regard to sunscreen?

According to current FDA rules, any formula that contains approved active ingredients and is labeled as a sunscreen is considered a *sunscreen* (FDA over-the-counter drug) and must adhere to its sunscreen regulations for manufacturing, testing, and labeling.

A sunscreen can use just one or any combination of approved active

ingredients. FDA regulations state that the *active ingredients* must appear in a separate box at the top on the back label.

Factoid: The FDA does not actually approve or disapprove of a sunscreen's ingredients and makes no determination as to a sunscreen's overall safety or ability to protect your skin. This includes the additional *inactive ingredients* that make up the remaining ingredients in the formula—the emulsifiers, stabilizers, colors, fragrances, preservatives, etc. The FDA only outlines the rules and regulations that must be followed in order to make an FDA-compliant sunscreen. Each country has separate rules and regulations for sunscreen compliance.

In order to make the best determination about which form of active ingredients are right for you, we must decode the differences between chemical and physical active ingredients.

Chemical Active Ingredients

How do chemical active ingredients work?

Chemical active ingredients filter UV light energy by absorbing it through a *chemical reaction of heat*. This chemical heat reaction is the reason chemical sunscreens feel like they are heating up after being applied to your skin.

What are the characteristics of chemical active ingredients?

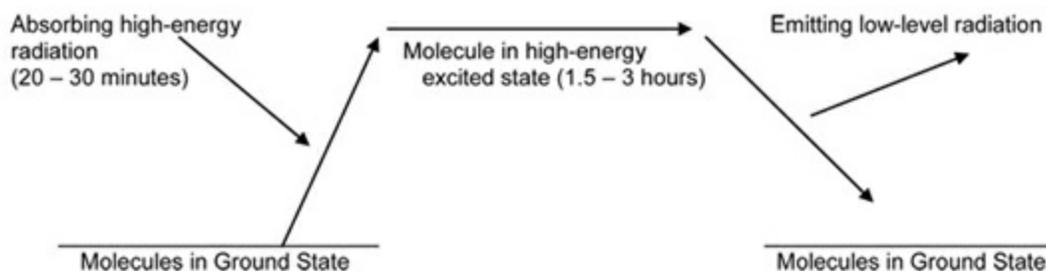
1. They have to penetrate the skin in order to function by absorbing energy from UV radiation.
2. Their molecules react to UV radiation. Most of them are photo-unstable. They degrade in UV light after some time and, as a consequence, produce free radicals with high risk of photosensitization.

Why are we told to apply sunscreen 20 to 30 minutes before sun exposure?

Sunscreens that use chemical active ingredients need to be applied 20 to

30 minutes before exposure to UV light because these chemical ingredients need this amount of time to ramp up to full absorbing capacity.

If you expose your skin to direct or indirect (reflected) UV light before chemical active ingredients have reached their full ability to absorb, your skin could experience stress or even sunburn, especially if it is during the heat of the day. The next diagram illustrates the life cycle of a chemical active ingredient.



(Shaat, 1990)

Diagram explanation: *UV-radiation makes the molecule jump from the ground state to a higher-energy excited state. During this movement, the chemical UV-filter absorbs high UV radiation energy. Returning to the ground state, the molecule emits lower radiation energy. Since it cannot destroy this energy, it has to convert the chemical energy, which is normally released as free radicals.*

Why should sunscreens with chemical active ingredients be re-applied every few hours?

Sunscreens that rely on chemical active ingredients to filter sunlight are only capable of maintaining level protection for a short period. As the above diagram shows, chemical active ingredients eventually become unstable and decay.

In order to ensure they continue absorbing UV light, the chemical active ingredients in the sunscreen, must be re-applied at least 20 -30 minutes before the previous application begins to lose its ability to absorb. Although several sunscreen manufacturers have re-worked their chemical active ingredients to maintain maximum levels for up to 3 hours, as a rule, you should re-apply them

every hour and a half. You should also reapply any sunscreen after exiting water.

Are there any negative side-effects associated with this release of low-level energy?

Yes. As shown in the above diagram, when chemical active ingredients begin to decay and lose their effectiveness, the UV energy they have absorbed is released as low-level energy. This energy release causes the formation of reactive oxygen species or free radicals. A 2006 University of California Riverside sunscreen study³ showed how three commonly used chemical active ingredients produced free radicals under strict laboratory conditions in less than 60 minutes, without exposing them to sunlight.

Why is it important to minimize free radicals and the damage they cause?

Free radicals form on your skin each time it is exposed to direct and indirect sunlight. The free radicals react with other molecules and produce damage to the fats, proteins, and DNA of the cells. You experience this damage as the destruction of collagen and elastin that can lead to excessive wrinkles, skin aging, and DNA mutations that develop into non-melanoma skin cancer, like basal and squamous cell carcinoma.

Physical or Natural Active Ingredients

How do physical or natural active ingredients work?

Physical active ingredients lie on top of skin and filter sunlight by reflecting or scattering UV light, rather than by absorption. Physical active ingredients are not absorbed into your skin. The only two active ingredients available in a physical or natural form are *zinc oxide* and *titanium dioxide*.

Do physical active ingredients need to be applied 20 to 30 minutes ahead of sun exposure?

No. Physical active ingredients begin to reflect or scatter UV light the moment they are applied, which increases the likelihood that they will be used properly and protect more fully.

Do physical active ingredients vary in quality?

Yes. There are varying grades of zinc oxide and titanium dioxide. Their impact on skin-friendliness, efficiency, and safety varies. Basically, both active ingredients are safe, hypoallergenic, and effective against UVB and UVA rays with zinc oxide superior in the UVA spectrum.

Uncoated physical particles have shown some photo-catalytic activity (reaction to UV radiation). Because of this reactivity, it is important for the surface of the particles to be treated with a coating material. Additionally, in order to protect against unwanted free radicals that could form as a result of the reactivity, the zinc oxide and titanium particles should then be formulated into a rich antioxidant-focused sunscreen formula (Antioxidants: Natural vitamin E, green tea, melanin, etc.).

When zinc oxide and titanium dioxide particles have a coating material, there is a significant impact on the functional efficiency—UV shielding, photostability, and dispersibility in a sunscreen formula.

Factoid: The FDA does not require a sunscreen to disclose specifics about the physical active ingredients being used in a sunscreen. At present, it is completely voluntary.

How can I know whether physical sunscreens ingredients are completely natural?

Independent certification is here! As of 2013, the Natural Products Association (NPA) is the only organization in the US that certifies natural products. They award their NPA *Natural Seal* to personal care products that meet their independent scrutiny. Under the program guidelines, a manufacturer must submit their entire formula for review and certification. To date, only a handful of sunscreens and moisturizers have been awarded the Natural Seal. All MelanSol® 100% Natural Skin Care products have been awarded the NPA Natural Seal.

Do zinc oxide and titanium dioxide particles vary in size?

Yes. The term *particle size* or *pigment size* is only used in connection with physical active ingredients—zinc oxide and titanium dioxide. There are *non-nano* particles (above 100nm-- nanometers) and *nano* particles (less than

100nm--nanometers). Several studies in Europe and here in the US have shown that the nano-sized zinc oxide pigments do not penetrate the skin.

Zinc oxide is the most effective UV filter and covers the whole spectrum UVB, UVA-1, and UVA-2. Physical active ingredients are better than chemical active ingredients because they are infinitely photostable (they don't break down when they come into contact with UV light) and have very low risk of making your skin photosensitive.

Nano-sized zinc oxide and titanium dioxide particles are more transparent and less visible on your skin than *nano*-sized particles. Visibility on the skin also depends very much on the concentration of the said ingredient in a formula.

Sunscreens and Water

Are sunscreens waterproof?

No. There is no such thing as a waterproof sunscreen. The term *waterproof* is a marketing term that is no longer allowed by the FDA. *Water resistant* is the FDA-approved term to describe how a sunscreen reacts in water. To make a water-resistant claim, your sunscreen must pass a 40- or 80-minute test for resistance to water. After a sunscreen passes the test, FDA regulations state that the designation must appear on the front label as follows:

Water Resistant or **Water Resistant**

(40 minutes)

(80 Minutes)

Factoid: The FDA test for water resistance is static. Because the vigorousness of activity in water can vary, it is recommended that you always reapply any sunscreen after exiting water.

Sources:

¹Roelandts, Rik. 2007. "History of Human Photobiology." In *Photodermatology*, edited by Henry W. Lim, Herbert Hönigsmann, and John L.M. Hawk, 1-13. Boca Raton, FL: CRC Press.

²RandomHistory.com

³http://www.faculty.ucr.edu/~christob/ROS_paper_2.pdf

Chapter 2

What's the SPF?

Understanding the Sun Protection Factor (SPF)

When we mention the word *sunscreen* in conversation, one of the first questions people ask is “what’s the SPF?” Unfortunately, the Sun Protection Factor is one of the most misunderstood aspects of sunscreen, allowing manufacturers to use this to their advantage and design a confusing array of sunscreens with SPF’s from 2 to 100. What we know for sure is that it is virtually impossible to put together a viable sun care plan without truly understanding what the SPF means.

What does SPF mean?

The *Sun Protection Factor (SPF)* is a numerical representation of how much ultraviolet B (UVB) light a sunscreen can filter.

Factoid: The SPF has nothing to do with filtering UVA light. Sunscreen has to undergo a different test to determine how effective it is at filtering UVA light.

According to the US Environmental Protection Agency (EPA), which also weighs in on the subject of sunscreen, the SPF is the amount of sunburn protection a sunscreen can provide an average user when used correctly. For example, an SPF 30, the most commonly recommended SPF, can filter 97% of Ultraviolet B (UVB) light.

What is one SPF?

Each increment of *Sun Protection Factor*, also called one SPF, is equal to the amount of time a person can spend in the sun, *without sunscreen*, before he or she experiences the effects of sunburn. This amount of time will vary from person to person, depending on their skin pigmentation. Darker skin pigmentations have a higher capacity to filter ultraviolet light.

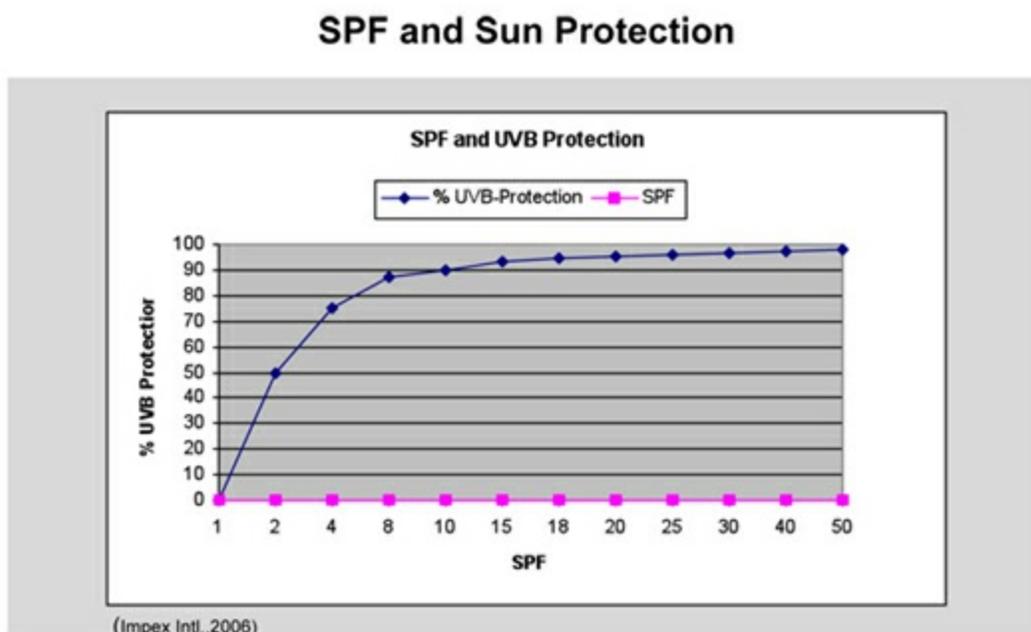
Is the SPF a general concept?

No. The SPF is specific to each person because everyone has a different

skin pigmentation and tolerance for sunlight. Using the above definition, let's say you are able to spend 30 minutes in the sun, without sunscreen, before experiencing the initial effects of sunburn. This 30-minute period would be equal to one SPF for you, which means you should be able to apply an SPF 30 and be protected from sunburn for a period 30 times longer than your personal SPF of 30 minutes or 15 hours. In real life, taking this literally would prove to be quite painful if you have fair skin that easily burns.

Does doubling the SPF mean double the UV protection?

No, it doesn't. The SPF scale is not linear. As the SPF number increases, the amount of increased UV filtering becomes less and less. The next chart illustrates this point.



As you can see, the above diagram reveals an increase in UV filtering of only 1% when you go from an SPF 30 (97% filtering) to an SPF 50 (98% filtering). If we were to extend this chart all the way to an SPF 100, the increase in UV filtering would only be a paltry 1% or 99% filtering. What you don't see illustrated in this chart is the percentage of increase in potentially harmful chemical active ingredients required to achieve a 100 SPF sunscreen.

The problem we want to highlight is how higher SPF numbers can easily lull you into a false sense of security, leading to unnecessary overexposure. Contrary to what some people believe, no sunscreen is capable of blocking

100% of UV radiation.

Focusing only on the SPF draws your attention away from other factors that should be considered before buying sunscreen, such as the percentage of chemical active ingredients they contain.

Below we have illustrated a real-world comparison between the percentage of UV protection and the amount of active ingredients (chemical or physical) required to achieve a desired specific SPF. These sunscreens actually exist on store shelves. All but one of the sunscreen SPF's described below are from sunscreens made with chemical active ingredients. We thought highlighting these facts would serve as an excellent way to make a point about the percentages involved.

<u>Percentage of UV Filtering</u>	<u>Percentage of "active ingredients" Required to achieve the SPF</u>
MelanSol® Certified Natural SPF 30: 97%	10% mineral titanium dioxide
Natural Sunscreen Brands (Popular brand name chemical sunscreens)	20% to 27% zinc oxide
SPF 30: 97%	20.8% chemicals
SPF 45: 97.7%	26.8% chemicals
SPF 50: 97.9%	30% chemicals
SPF 70: 98.7%	31.8% chemicals
SPF 100: 99%	39% chemicals

Our view is that sunscreen should be selected based upon your intent for its use and your skin's tolerance for sun exposure, not because some person, company, or organization recommends you to select a specific SPF number. In our chapter on vitamin D, we discuss the best way for you to determine your skin's tolerance for sunlight, a key component for putting together a healthy sun care plan.

Chapter 3

Chemical Sunscreens—Know the Risks

The most readily available sunscreens on the market rely on chemical active ingredients to absorb UV light. They are produced by recognizable manufacturers who have dominated the market for decades and invested millions pushing their message that *sunscreen lotions and sprays are safe to use to protect your skin from sunburn, skin aging, and skin cancer*.

This message is supported by the vast majority of the medical community, the FDA, organizations, and foundations. We see their message as one sided and misleading. It has been able to continue because very few people, including medical professionals, understand exactly how sunscreen works and the risks they present. Sunscreen is simply an over-the-counter drug.

The point we want to make is that traditional sunscreens, which use chemical active ingredients, have risks that are not being discussed openly. We will present them so that you can decide for yourself.

We submit that sunscreens relying on chemical active ingredients are obsolete and have longer-term risks that outweigh any perceived benefit derived from using them and that certified natural sunscreens should play a greater role in skin protection. Here are a few reasons why we feel this way.

#1 Chemical active ingredients contaminate your body.

Your skin is the largest organ of your body, and it is a recognized fact that what you put on your skin can pass through and enter the bloodstream. When it comes to using chemical sunscreen, a 2006 University of California Riverside study¹ revealed that 1% to 2% of three commonly used sunscreen chemical active ingredients—Benzophenone-3, Octyl methoxycinnamate, and Octocrylene—were absorbed into the body after being applied to skin.

Ever-popular spray sunscreens, regardless how convenient, give new meaning to the term *contaminating your body*, by giving harmful chemicals an even better delivery system to enter the human body—through the eyes, nose, and mouth.

Physical active ingredients—zinc oxide and titanium dioxide—represent safer and healthier forms of UV protection. They are naturally occurring, can be obtained in a *certified natural* form, and lie on top of your skin. They do not require a chemical reaction to filter UV light, and they do not penetrate your skin.

#2 Chemical active ingredients have certain side effects.

According to safecosmetics.org, there are 25 cancer-causing and thyroid-, endocrine-, and hormone-disrupting chemicals in everyday skin care and personal care products, such as toothpaste, deodorant, soap, shampoo, cosmetics, moisturizers, and sunscreen. Their research revealed an average of 16 of these chemicals in women and 12 of them in men on any given day.

In 2003, the Centers for Disease Control (CDC) conducted a study to assess exposure to BP-3 in a representative sample of the US general population over 6 years of age². They sampled 2,716 urine samples, collected as part of the 2003–2004 National Health and Nutrition Examination Survey. They detected BP-3 in 96.8% of the samples tested. (See our chapter on Sun Protection Factor (SPF) for a more in-depth explanation of SPF.) We have reprinted the chart from Chapter 1 because it has the side effects of each active ingredient listed in the right-hand column.

<u>UV filter</u>	<u>Active Side Effect</u>
p-Aminobenzoic acid	Produces Reactive Oxygen Species
Padimate O	PABA derivative. Controversial active because after absorbing UV rays, the active may indirectly produce DNA damage
Phenylbenzimidazole sulfonic acid	Produces Reactive Oxygen Species
Cinoxate	Linked to carcinogenicity. No longer commonly used in sunscreens.
Dioxybenzone	Derivative of Benzophenone
Oxybenzone	In 2006, a study showed that oxybenzone was photo carcinogenic; had a destructive effect on DNA whenever it was exposed to light. Estrogenic activity
Homosalate	Undergoes some degradation in sunlight; estrogenic activity

Menthyl anthranilate	
Octocrylene	In 2006, a study showed that oxybenzone was photo carcinogenic; had a destructive effect on DNA whenever it was exposed to light. Strong allergen (contact dermatitis)
Octyl methoxycinnamate	Degrades over time when exposed to sunlight, therefore, not the most photostable. Estrogenic activity.
Octyl salicylate	Undergoes some degradation in sunlight. Belongs to the group of salicylates (Homosalates). Estrogenic activity.
Sulisobenzene	Absorbed by the skin so its safety use in sunscreen is questionable. Strong allergen (contact dermatitis, photoallergic).
Trolamine salicylate	Chemical similar to aspirin
Avobenzene	Very photounstable; degrades in light
Ecamsule	
Zinc Oxide (ZnO)	Physical filter O.K., Photostable; less likely to cause irritation
Titanium Dioxide	Physical filter O.K., Photostable; less likely to cause irritation

#3 Chemical active ingredients contribute to premature skin aging.

UV skin damage, also referred to as photoaging damage, is caused by free radicals that form on your skin when it's exposed to UV light. This is the kind of skin damage that sunscreens relying on chemical active ingredients claim to protect you from.

News Flash!!! The previously referenced study by University of California Riverside¹ proved beyond a doubt that the three sunscreen chemical active ingredients they tested actually *caused* the development of Reactive Oxygen Species (ROS). Reactive Oxygen Species is the scientific term for *free radicals*.

ROS cause sunburn and skin aging, damage to skin cells, and DNA mutations in skin cells that cause non-melanoma skin cancer—basal cell and squamous cell carcinoma—two of the most diagnosed forms of skin cancer in

the US. Of the people we've spoke with over the years, aside from preventing sunburn, one of the top reasons they told us they wear sunscreen is to help prevent skin aging and skin cancer. Many are mortified when we show them how chemical sunscreens do the complete opposite of what people have been led to believe.

#4 Sunscreen chemical active ingredients have been identified in women's breast milk in two separate studies.

Two separate studies by Margret Schlumpf and her team of researchers at the University of Zurich³ confirmed the existence of five popular chemical active ingredients in mothers' breast milk. They also discovered and confirmed that these sunscreen chemicals exhibited endocrine-disrupting activity.

#5 Inactive ingredients in chemical sunscreen have issues too.

So far, we have confined our discussion to sunscreen chemical active ingredients. The additional ingredients that make up the rest of a sunscreen formula are called *inactive ingredients*. They act to stabilize the active ingredients; create the texture, color, and smell they want to achieve; and preserve the formula.

These additional chemical ingredients could be completely harmless; however, many of them have been linked to skin irritation, allergies, and disrupting thyroid, endocrine, and hormonal systems. You want to avoid parabens, alcohols, glycols, formaldehyde, synthetic preservatives, fragrances, and colors. As a rule of thumb, if you can't understand or pronounce the ingredients, don't buy the product.

Are spray sunscreens safe?

In our view, they are not. Spray sunscreen is an excellent example of how the sunscreen industry has responded to the main sunscreen complaint—the goopiness factor. Sprays might seem like an innovative idea, however, there are harmful side effects anytime you launch chemicals into the air.

Spray sunscreens are often applied incorrectly, providing protection that is entirely inadequate. When the chemicals they contain are given flight, they linger in the air to more easily gain entry into your eyes, nose, and mouth. What we see most often is how many people downwind of spray sunscreen receive

no protection, yet they experience all of the negative side effects, without their express consent. Many a complaint has been lodged at resorts because of their use around pools and on beaches. We foresee a future where these resorts will ban spray sunscreens because compensating angry guests with complimentary lunches and other amenities will outweigh the cost of allowing them.

An issue of *Consumer Reports* recently warned parents about the dangers of spraying sunscreen around children's face—echoing our concerns about how dangerous it is for sunscreen chemicals to have easier access to the body.

One of the biggest reasons to cease using spray sunscreen is their negative effect on the environment. Their airborne chemicals adhere to plants that animals eat, and they get washed into oceans, lakes, streams, and rivers for wildlife to ingest.

One Woman's Story

A young mother called one day to thank us. Unfortunately, her painful story is being played out all over the country on people with sensitive skin. This young woman said she had contracted a severe skin condition that would not go away, regardless of anything she did. She tried various over-the-counter remedies and prescriptions from various physicians and dermatologists, all to no avail.

After one doctor's biopsy proved to be negative, she was able to get an appointment with a university dermatologists close by. She was overjoyed when the dermatologist was able to put a name on her constant irritation—*severe contact dermatitis*. A condition where the skin becomes red, sore, or inflamed after direct contact with a particular substance.

After asking about her skin care habits and discussing the current mix of skin care products she was using, the dermatologist said her skin irritation was likely due to coming into contact with two synthetic preservatives commonly used in a host of brand-name sunscreens, moisturizers, and other skin care products. She said she was alarmed at how products she had used for years could suddenly seem to rebel against her skin. The synthetic preservatives her dermatologist was referring to are phenoxyethanol and methylisothiazolinone. Two words you wouldn't want to have to say in a hurry.

This dermatologist said when she stopped using products that contained the two preservatives, her condition would likely clear up, which it did. She

also recommended she switch to natural forms of sunscreen and moisturizer from now on to ensure her sensitive skin would not experience such irritation again. This is when she found MelanSol® 100% Natural Skin Care and said she experienced clear healthy skin again.

¹Kerry M. Hanson, Enrico Gratton, Christopher J. Bardeen, Sunscreen Enhancement of UV-Induced Reactive Oxygen Species in the Skin, Free Radical Biology and Medicine (2006), doi:10.1016/j.freeradbiomed.2006.06.011

http://www.faculty.ucr.edu/~christob/ROS_paper_2.pdf

²Environ Health Perspect. 2008 July; 116(7): 893-897. Published online 2008 March 21. Doi: 10.1289/ehp.11269 PMID: PMC2453157. This is an Open Access article: verbatim copying and redistribution of this article are permitted in all media for any purpose.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2453157/>

³Schlumpf study--

http://www.nrp50.ch/fileadmin/user_upload/Dokumente/chimia.2008.345.pdf

Chapter 4

Babies, Children, and Sunscreen

We can all agree that children are precious, should be handled with great care, and don't really have the option of selecting the products that are applied to their skin. When selecting a sunscreen, parents have hundreds of options and many end up defaulting to what's most convenient, readily available, and reasonable in cost—spray sunscreen. Parents automatically assume all sunscreens are safe—because they would not be for sale if they were unsafe.

Should there be more conversation about the safety of traditional baby sunscreen?

Yes. When we explain how sunscreens work and the dangers associated with using them on infants and children, parents are shocked and wonder why the information was never disclosed to them. It is not the fault of doctors. They are not supposed to be an expert on the topic of sunscreen. Doctors are highly trained health professionals you visit when something is wrong with your health, such as after the sunscreen has caused skin irritation. As a parent, it is up to you to find out all you can about sunscreens and other skin care products you intend to use on your child. This book is designed to help you ask the right questions.

Are sunscreens for babies and children safe?

Our view is that traditional baby sunscreens are not as safe as you are being led to believe. Two things are very puzzling to us. First, that high concentrations of chemical active ingredients are being used in sunscreens (classified as over-the-counter drugs) specifically targeted toward infants and children. And second, that there is zero conversation about it.

An overwhelming number of parents we've spoken to over the years sincerely believed a higher Sun Protection Factor (SPF) provided more sun protection for their child. We view this misconception as the reason why many brand-name baby and children's sunscreens have Sun Protection Factors

significantly higher than SPF 30. The rule of thumb you want to keep in mind when it comes to traditional brand-name sunscreen is this: The higher the Sun Protection Factor (SPF), the higher the concentration of harmful chemical active ingredients. We site these two examples of baby sunscreen we found.

1. A well-known brand of Baby Sunscreen SPF 70+ with a concentration of sunscreen chemical active ingredients as high as 37%. Among the chemical active ingredients was oxybenzone, also known as benzophenone-3 (BP-3)—one of the three sunscreen active ingredients mentioned in the University of California Riverside study we highlighted in Chapter 2 on sunscreen risks. Oxybenzone has been linked to endocrine disruption, photoallergic reactions, cell damage, and hormone disruption. It has also been associated with a high absorption rate through the skin and with creating a pathway whereby other chemicals can penetrate the skin.
2. Another brand-name Baby Sunscreen SPF 50 had a 27.5% concentration of chemical active ingredients. This sunscreen used three chemical active ingredients—homosalate, octinoxate, and octisalate—that exhibit estrogenic activity.

The *higher is better* marketing approach with sunscreen is very misleading. For instance, an SPF 30 sunscreen will filter 97% of UVB light, while an SPF 100 will filter 99% of UVB light. The minor 2% increase in UV light filtering doesn't warrant subjecting your skin to the significant increase in chemical active ingredients it takes to achieve an SPF of 100. Keep in mind that the chemicals we are referring to are only the *active ingredients* and don't include the additional *inactive ingredients*—the chemical fragrances, colors, and synthetic preservatives that make up the rest of the sunscreen formula. *Certified* all-natural sunscreens are safer, healthier, and provide more diverse sun protection for babies and children alike.

What is the best sunscreen for babies and children?

Advances in all-natural sunscreens have rendered traditional sunscreen obsolete, although you wouldn't know by looking at the sunscreen section of your local store. The most technologically advanced sunscreens are certified

100% natural, safer (100% chemical-free active and inactive ingredients), and provide more comprehensive protection against sunburn, skin aging damage, and non-melanoma skin cancers through their use of bioactive antioxidants.

How can I be assured a natural baby sunscreen is really natural?

There is a new classification of sunscreens on the market called *Certified Natural*. The ingredients in these sunscreens have been independently certified natural by the Natural Products Association of the USA. The **Natural Products Association** (NPA) awards its *Natural Seal* to those sunscreens that have met its stringent qualifications for receiving the Natural Seal.

Once the complete sunscreen formula has been submitted for certification, the NPA makes sure each and every sunscreen ingredient (including the active ingredients), and the way it was processed, is truthfully natural. No program in the US is as comprehensive for assuring a product is natural.

You can find a list of sunscreens that have been awarded the NPA Natural Seal by visiting the link that follows. MelanSol® is one of the few brands with a complete line of sunscreens that have been certified, including one for baby.

<http://www.npainfo.org/NPA/Custom/PersonalCareProducts.aspx>

What can we do to protect our children as they play in the sun?

There is no one best way to protect your child. Your sun care plan should be comprehensive and include the three pillars of protection: nutrition, sunscreen, and protective clothing. You must be mindful of the importance of combining protected and unprotected exposure to ensure your children maintain healthy skin and a healthy immune system.

If your child is going to experience lengthy sun exposure, where the risk of sunburn is high, we suggest you incorporate three things into your sun care plan:

Set aside time for unprotected sun exposure—this can help your child maintain a healthy immune system. (See our chapter on vitamin D for more information on arriving at an appropriate time period for

unprotected exposure and our antioxidant chapter to better understand how they can help prevent skin damage during casual unprotected sun exposure.)

Use certified all-natural sunscreen—after unprotected sun exposure, apply a certified all-natural sunscreen that combines bioactive antioxidants with reflective mineral sunscreen active ingredients, like titanium dioxide and zinc oxide, to provide premium skin protection. Make sure to focus sunscreen on areas most prone to sunburn—face, arms, hands, chest, shoulders, back, feet, and front and back of the neck.

Have sun-appropriate clothing on hand—sun-protective clothing will stop further exposure to UV light—wide brim hats, long pants, and long sleeve shirts, and shoes that completely cover the feet are all appropriate clothing to wear during extended periods of sun exposure.

Should we apply sunscreen to our children every day?

Maybe not. If short periods of outdoor activity pose no risk of sunburn, a topical application of certified natural bioactive antioxidants within a nourishing and hydrating moisturizer and sun-focused nutrition (see our antioxidant chapter) can be better moves than defaulting to sunscreen every day for three reasons:

1. Natural topical bioactive antioxidant technology and antioxidant-focused nutrition can do a better job of protecting skin from free radicals that accumulate on skin during short periods of sun exposure throughout the day.
2. A sunscreen's SPF filters sunlight and prevents sunburn but has little capacity for protecting skin from cellular damage caused by free radicals. Preventing cellular damage requires a combination of antioxidants and sunscreens that complement each other, resulting in superior photo protection (sun protection).
3. Short periods of unprotected sun exposure are a great time for the body to produce vitamin D.

What areas of the body should I emphasize protecting most?

Dermatologists we spoke with said 85% of the non-melanoma skin cancer (basal and squamous cell carcinoma) they see on patients occurs between the upper arms and the tips of the fingers and from the chest to the top of the head. One dermatologist even told us he sees 5% to 10% of these cancers on eyelids because people go to the beach or pool and close their eyes while laying in direct sun, without protecting these areas. These are the areas we suggest you focus on most, especially by using all-natural sunscreens around your eye area—MelanSol® sunscreens are safe to use around your eyes because they don't irritate and burn your eyes.

Until sunscreens became prevalent, parents would just let their children go outside and play. There was never any overriding fear about whether it was safe to expose children to sunlight. Yes, there was an occasional sunburn or two; however, parents quickly learned appropriate time limits for sun exposure.

Chapter 5

Sunscreen and Ultraviolet Light

When it comes to sun care, having an awareness of the sun's ultraviolet light is important. If you desire to have a deeper understanding of this topic, we have provided several resources at the end of this chapter.

What is ultraviolet light?

The sun emits three forms of ultraviolet rays that cannot be seen by the human eye—UVA, UVB, and UVC. These rays appear on the electromagnetic spectrum and radiate around you every day.

The UVC wavelength is the shortest, ranging from 100nm to 290nm (nanometers).

The UVB wavelength is a bit longer, ranging between at 290nm and 320nm.

The UVA wavelength is the longest, ranging from 320nm to 400nm.

What are the benefits of ultraviolet light?

Your body needs exposure to UVB light in order to produce (synthesize) vitamin D, an essential steroid hormone that boosts your body's immune system, builds and maintains strong bones, and helps your body fight disease.

What are the risks associated with exposing skin to UV light?

Your main risk comes from the effects of overexposure—exposing your skin to UV light for periods longer than it is capable of protecting itself. For someone with fair skin, the danger associated with overexposure is much greater than for someone with medium to dark skin. Here are the risks commonly associated with different forms of ultraviolet light.

UVA light:

- 100% intense from sunup to sundown.
- Capable of reaching deeper into your skin. This deeper penetration causes free radicals to form on a deeper level and contribute to sunburn, skin cell damage, and DNA mutations to skin cells that can lead to skin cancer.

- Can penetrate window glass

UVB light:

- Only reaches the surface layer of skin.
- Intense when the sun is cresting in the sky—usually between 11 a.m. and 3 p.m.
- Sunscreen use blocks your body's production of vitamin D because it blocks UVB light.
- Stimulates tanning (melanin production). Too much exposure to UVB light causes the formation of free radicals that can lead to sunburn and skin aging.
- Can't penetrate glass

UVC light:

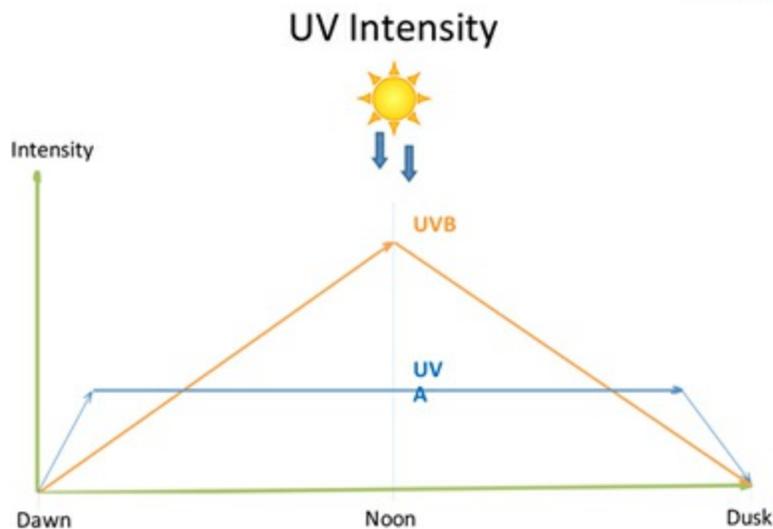
- Usually fails to penetrate the earth's ozone layer and has no effect on your skin.

What is the number one mistake people make when encountering UVA light?

Their greatest mistake is not paying attention to their skin. Your skin will always give you signs—shades of redness and tender skin—when it has experienced enough sun exposure. Having an awareness of when you have had enough is crucial to protecting your skin from overexposure that can lead to sunburn and longer-term skin damage.

The diagram below illustrates how UVA remains fairly constant through the day as compared to UVB.

The intensity of UVB starts out very low at dawn, gradually increases until midday when the sun is overhead, then gradually decreases in intensity as the afternoon progresses. The peak sun hours are between 10 a.m. and 2 p.m., when the UVB intensity is highest. As compared to UVB, UVA remains fairly constant from dusk until dawn.



What is the greatest miscalculation people make when encountering more intense UV light in a climate than their skin is used to?

They mistakenly believe a high SPF sunscreen will equalize their skin with the environment. There is no way their skin can acclimate to the more intense UV light during a short vacation.

How can you determine whether a sunscreen is capable of filtering UVA light?

In 2013, the US FDA implemented new rules for testing and labeling sunscreen. They required all sunscreens to be tested for their effectiveness at filtering UVA radiation. Those sunscreens that passed the new FDA test would be able to label their sunscreen as being ***Broad Spectrum***. What the FDA test fails to do is establish a ratings scale that shows consumers how effective one sunscreen brand is versus another at protecting skin from UVA light. Our view is that this missing rating component renders the test incomplete and of no real use to consumers.

Is the US FDA test for a sunscreen's ability to filter UVA light used anywhere else in the world?

No. The test used by the rest of the world is more comprehensive and has a ratings scale of low, medium, and high to let consumers know how well a particular sunscreen filters UVA light. The test is called the Persistent Pigment Darkening Test (PPD test). This test results in a UVA Protection Factor Rating

(UVA-PF) when the sunscreen's UVA protection levels are at least 1/3 of the stated SPF on the product. This is the EU logo showing compliance with testing requirements.



In the US, testing under EU guidelines for UVA effectiveness is voluntary and usually done because the products are also sold outside of the US. Several all-natural sunscreen brands have chosen to have their products tested under EU guidelines and passed with high ratings for UVA protection. These brands include MelanSol®, Lavera, and Badger.

Should people with darker skin approach the sun's ultraviolet light differently?

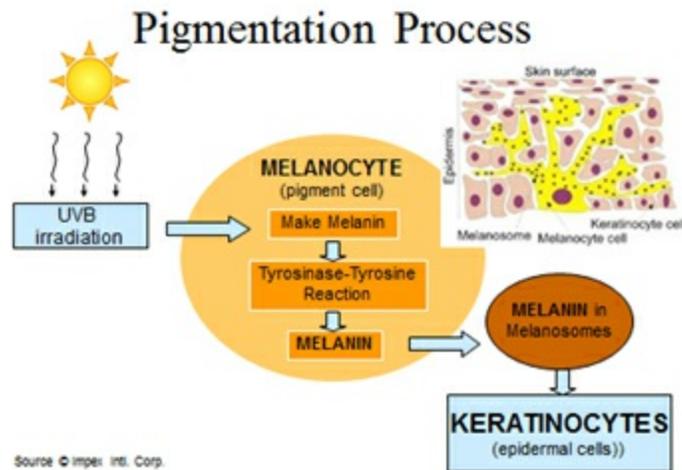
Yes. People with varying degrees of dark skin pigment should keep two things in mind.

1) Dark skin pigments have a higher capacity to filter UVA and UVB light than fair skin, due to the existence of more melanin in the skin. The darker your skin, the greater your melanin protection. This higher filtering capacity is very much like what sunscreen does, so the use of high SPF sunscreens isn't as beneficial as it is with fair skin during lengthy periods of sun exposure.

2) Because darker skin pigments filter a high degree of UVB light, more unprotected sun exposure is necessary for the body to produce the same level of vitamin D as someone with fair skin. According to James Dowd, MD, author of *The Vitamin D Cure*, 95% of people of color are vitamin D deficient as a result.

How does UVB light help skin produce a tan (skin pigment)?

The diagram below shows how protective melanin (tan) is produced by melanocyte pigment cells when skin is exposed to UVB light.



How many skin types are there?

There are six different skin types. The next chart outlines the *general* guidelines we refer to for clients who are purchasing MelanSol® 100% Natural Sunscreen. It is followed by actual pictures of people who have one of the six skin types listed. Individuals with each skin type should use sunscreen that is designed to provide the best protection for their skin type, their proposed activity, and the period of time they intend to be exposed to sunlight. Keep in mind that these are only general guidelines.

Skin types and recommended MelanSol® products

Skin Type*	Sunburn Tendency	Tan Tendency	Skin, Hair, and Eye Color	Recommended MelanSol® Product
I	Always burns	Never tans	Fair skin (extremely sensitive), freckles, blond or red hair, blue or green eyes	100% Natural Sunscreen Lotion SPF-30
II	Always burns	Sometimes tans	Fair skin (very sensitive), blond hair, blue or green eyes	100% Natural Sunscreen Lotion SPF-20(**)
III	Sometimes burns	Always tans	Caucasian skin (sensitive), usually blond to dark hair, green or brown eyes	100% Natural Sunscreen Lotion SPF-20(**)
IV	Rarely burns	Always tans	Mediterranean, Hispanic, Asian, olive skin (moderately sensitive), dark hair, brown eyes	100% Natural Sunscreen Lotion SPF-10
V	Almost never burns	Tans deeply	Middle Eastern, Latino, Indian, light-skinned blacks (minimally sensitive)	100% Natural Sunscreen Lotion SPF-10
VI	Never burns	Deeply pigmented	Markedly pigmented black skin (not sensitive)	100% Natural Moisturizing and After Sun Lotion

(*Source: Fitzgerald, 1975) ** Visiting areas closer to the equator might require using the next higher SPF. For sporting activities and playing in water, fair skin should use the SPF-30.

The next picture depicts the six skin types described above. Again, please keep in mind that these depictions are general and serve only as a basic guideline for where to begin your sun care plan. The time of exposure, activity involved, geographic location, and degree of previous sun exposure are all subjective factors that come into play when deciding which sunscreen to use.



Chapter 6

Antioxidants—The Sun Protection Secret

What are antioxidants?

Antioxidants act as cell protectors that counteract the damaging, but normal, effects of oxidation in tissues. Antioxidants are naturally found in plants, fruits, and vegetables and act to prevent *free radicals* from damaging cells.

What are free radicals?

Oxygen, an essential element for life, can create damaging by-products called *free radicals* during normal cellular metabolism. *Free radicals*, also called *reactive oxygen species*, are chemically active atoms or molecular fragments that have a charge due to an excess or deficient number of electrons in the outer shell.

Free radicals attack the fats, protein, and DNA in our cells and break down the elastin and collagen in our skin. This process promotes sunburn, acceleration in skin aging (excessive wrinkles, sagging skin, and sun spots), and the development of non-melanoma skin cancer, such as basal and squamous cell carcinoma.

How are free radicals connected to sunburn, skin aging, and skin cancer?

Each time you expose your skin to direct or indirect sunlight, free radicals form in your skin. Although everyone has some degree of antioxidant protection to counteract their continued accumulation, *sunburn*, also referred to as *oxidative stress*, occurs when the accumulating free radicals exceed your body's natural ability to keep them under control.

Skin aging is the effect of continuous free radical damage, non-melanoma skin cancer being the most advanced form of damage, when free radicals have mutated the DNA of your skin cell.

Where can I get antioxidants?

Antioxidants can be taken *orally* through food and supplements, or applied *topically* via sunscreens and moisturizers like MelanSol®, that contain strong bioactive antioxidants.

Why is it important to use antioxidants during sun exposure?

Sunburn, skin aging, and non-melanoma skin cancer, like basal and squamous cell carcinoma, are the result of varying degrees of free radical damage, so it's important to focus on using antioxidants to boost your body's natural protection.

Can I get my antioxidants orally?

Foods that have exceptionally high concentrations of *carotenoids* and *antioxidants* have been shown to increase your skin's ability to protect itself from UV damage. According to Suzanne Landry, author of *The Passionate Vegetable* (www.suzannelandry.com), four foods with the highest capacity of antioxidants per serving are small red beans, wild blueberries, red kidney beans, and pinto beans. For a complete list of foods ranked for their concentration of antioxidants, please visit the following link:

http://en.wikipedia.org/wiki/List_of_antioxidants_in_food

Two supplements with super high concentrations of antioxidants can be found in *astaxanthin*, derived from a red algae grown in Hawaii, and *Astaxanthol*, a signature formula developed by Mitchell A. Fleischer, MD. For more information about either of these formulas, visit the following links:

Astaxanthin—<http://en.wikipedia.org/wiki/Astaxanthin>

Astaxanthol—<http://progressivelabs.com/product.php?productid=17147&cat=250&page=1>

Can I find natural antioxidants in skin care products?

Although there are hundreds of skin and sun care products that contain some form of synthetic or natural antioxidants, be it soy, vitamin C, coffee, green tea, vitamin E, etc., the vast majority of these antioxidants are ineffective free radical protectors because they lack a high level of bioactivity on the skin—the capacity to constantly capture and/or eliminate the infinite amount of free radicals that accumulate on your skin.

In the late 1990s, Peter Zahner, as part of developing a chemical-free

sunscreen that would keep his non-melanoma skin cancer from returning, invented a bioactive combination of 100% natural antioxidants that acted synergistically when applied to skin. At the time, antioxidants weren't even being used in sunscreen. Unfortunately, as people have become more aware of the importance of antioxidants, synthetic and lesser bioactive forms of natural antioxidants are being included in sunscreen and moisturizer formulas, not because they are effective, but to boost their marketability.

How do antioxidants help protect skin from sunburn, premature aging, and non-melanoma skin cancer?Antioxidants help prevent free radicals from damaging skin cells by binding with them before they can do any harm. The higher an antioxidant's capacity to capture and eliminate free radicals, the greater the free radical protection you receive.

For example, Bio-Melanin, one of the highly bioactive natural antioxidants used in MelanSol® sunscreen, is extracted from the fruit of the date palm and has a dark brown pigment. The pigment, or melanin, protects the fruit from intense solar radiation in the desert environment. Bio-Melanin acts like your body's own melanin to protect your skin by safely neutralizing free radicals. Studies have concluded that Bio-Melanin and green tea counteract the adverse biological effects of UV radiation and protect against the effects of both UVB and UVA rays via its photo protective effect on human skin and its polyphenolic antioxidant contents. Bio-Melanin and green tea inhibit UV-induced erythema response in the skin (redness reaction). Bio-Melanin is a dynamic free radical scavenger and has a 1,000 times greater capacity than natural vitamin E for capturing and terminating free radicals.

Can combining antioxidants with sunscreen active ingredients help prevent sunburn?

People are under the impression that sunscreen active ingredients, aside from absorbing or reflecting sunlight, also prevent free radical damage that can lead to skin aging and skin cancer. Unfortunately, they do not perform this function. As previously stated, only antioxidants that are highly bioactive can perform this function, so their inclusion in a sunscreen formula is essential if it is to provide complete UV protection. In such a formula, natural active ingredients safely reflect or scatter high percentages of UV light, while natural antioxidants control accumulating free radicals.

Is there any proof that sunscreens with bioactive natural antioxidants offer better UV protection?

Yes. A groundbreaking 2003 university study, published in the *Journal of the American Academy of Dermatology*, said, “Sunscreens are useful, but their protection is not ideal because of inadequate use, incomplete spectral protection, and toxicity. Skin naturally uses antioxidants (AOs) to protect itself from photodamage. This scientific review summarizes what is known about how photodamage occurs; why **sunscreens—the current gold standard of photo-protection—are inadequate**; and how topical AOs help protect against skin cancer and photo-aging changes.” The university study reviewed vitamin C, vitamin E, selenium, zinc, silymarin, soy isoflavones, and tea polyphenols and said, “**Their topical use may favorably supplement sunscreen protection and provide additional anti-carcinogenic protection.**” (J Am Acad. Dermatol 2003; 48: 1-19. To view the full report, visit www.PureSunscreen.com.)

Our view is that an effective, comprehensive sun care/vitamin D philosophy should include using highly bioactive topical antioxidants, like the synergistic combination contained in the MelanSol® 100% Natural Skin Care, together with antioxidant-rich foods and super-antioxidant supplements, such as astaxanthin and Astaxanthol.

Because Astaxanthol is one of the most innovative super-antioxidant supplements available and uniquely positioned to complement MelanSol® moisturizers and sunscreens, we have asked its formulator, Mitchell A. Fleisher M.D., D.Ht., D.A.B.F.M., to explain Astaxanthol in deeper detail. His indepth explanation appears at the end of this book.

Chapter 7

The Vitamin D–Sunscreen Paradox

In our view, a serious health issue is getting little attention or discussion in mainstream America—vitamin D deficiency. A growing number of forward-thinking experts in the traditional and natural healthcare field are sounding the alarm about the connection between vitamin D and a strong immune system that can fight colds, fatigue, influenza, and a wide array of other conditions and diseases.

This chapter is not about giving medical advice; our goal is to elevate awareness about the importance of vitamin D to your overall health and how sunscreen contributes to immune deficiency by blocking your body's ability to produce vitamin D. At the end of this chapter, we have provided highly credible resources we feel will be able to give you all of the additional information you need about vitamin D.

What is vitamin D?

Vitamin D, is actually a steroid hormone your body naturally produces (synthesizes) when your skin is exposed to sunlight.

According to Mitchell A. Fleisher, M.D., D.Ht., D.A.B.F.M., Dc.A.B.C.T. Homeopathic Family Medicine & Nutritional Therapy (www.alternativemedcare.com), *Vitamin D3, cholecalciferol, is a critically important nutrient that is much more than just a vitamin. It actually acts as a steroid hormone involved in multiple physiological pathways essential for health and well-being, including mineral and bone metabolism, and normal cardiovascular, neurological and immune system function. Adequate levels of vitamin D3, i.e., greater than 50 nanograms per millimeter, help prevent bone loss (osteopenia and osteoporosis), atherosclerotic heart and blood vessel disease, Alzheimer's disease, several different forms of cancer, as well as being the very best prevention for viral influenza.*

Where can I get vitamin D?

The two sources of vitamin D are:

- Exposure of your skin to sunlight
- Vitamin D3 from supplements and diet

Which way of getting vitamin D is more beneficial?

There is a significant difference between the two different ways of getting vitamin D.

Vitamin D from the sun: The vitamin D your body naturally produces when your skin is exposed to sunlight can be stored by your body until it is needed. During the summer months, when ultraviolet B (UVB) light levels are high, the vitamin D your body produces is stored in your cellular tissues, so your body can tap in to it during the winter months, when the sun's levels of ultraviolet light are lower and your body is less able to synthesize vitamin D. Also, vitamin D from the sun *does* influence your mood.

Vitamin D from Supplements and diet: The most important issue here is that your body doesn't store the vitamin D you get through supplements and diet, so you must get more every day. Also, vitamin D3 you get from supplements and diet *does not* influence your mood.

Why is vitamin D so important?

Vitamin D supports the proper function of cells. According to the *Vitamin D Council* (www.vitamindcouncil.org), there is a connection between low vitamin D levels and colds and flu, bone health, asthma, rickets, multiple sclerosis, fatigue, depression, Type II diabetes, preeclampsia, colorectal cancer, other cancers, and more.

If vitamin D is so important, why isn't it talked about more often?

We can't say for sure; however, one of our main goals is to illuminate the conversation so that you are much more aware of how your body's vitamin D level is affecting your daily health. We also want to sound the alarm about how excessive sunscreen use prevents your body from producing the vitamin D it needs to keep you healthy. What's not surprising is how the message about vitamin D deficiency is very much at odds with the staggering amount of resources devoted to selling sunscreen and a consistent message from the medical community, the FDA, and various organizations to wear lots of

sunscreen.

Who is most at risk of having low vitamin D levels?

Large segments of the U.S. population are very much at risk. In his groundbreaking book, **The Vitamin D Cure**, James Dowd, M.D., writes *Current statistics from the Centers for Disease Control and Prevention tell us that more than half of the general population is vitamin D—deficient regardless of age. And about 70 percent of elderly Americans and 90 percent of Americans of color are vitamin D—deficient. Add to the mix people who are overweight or obese because of dietary imbalance or inactivity, and the totals are staggering.*

What should I do to make sure I don't fall prey to vitamin D deficiency?

What you can do is become intimately familiar with your number—your body's level of vitamin D3. Ask your doctor to test your body's level of vitamin D3. If your insurance won't pay for it, do it anyway. It will be the best money you have ever spent. Once you know your number, you can put together a plan that involves sun exposure, diet and supplements to give your body the best defense against many of the illnesses that plague our society today.

Shouldn't I avoid the sun?

The short answer is no. The pervasive message that the sun is bad, that you should fear it, and that you should wear sunscreen with an SPF 15 or greater every day or suffer skin aging and skin cancer later is the absolute wrong message. The mental and physical health benefits you receive from getting vitamin D from sun exposure far outweigh the negative consequences of exposure.

We are not advocating that you abuse the sun. It is entirely possible to have your cake and eat it too when it comes to enjoying the sun. When you are mindful of your need for unprotected sun exposure, are aware of your skin's tolerance for sunlight, use appropriate clothing when necessary, and keep mental tabs on your time in the sun, a healthy balance is easily achievable. It's not rocket science—just plain common sense.

If you are into sports that require spending time in the sun, an antioxidant focused certified natural sunscreen that meets your needs is always advisable

during sun exposure in excess of what your skin can handle.

Shouldn't I use sunscreen every day?

No, not if you want your body to have any chance of producing vitamin D. The Sun Protection Factor (SPF) gauges just how much UVB light it prevents from reaching your skin. For example, if you use an SPF 30 sunscreen, you are blocking 97% of available UVB light spectrum. In a Swiss newspaper interview, Prof. Dr. Annette Bischoff-Ferrari, a member of the Medical Faculty of the University of Zurich, said, *We know that with a sunscreen protection factor of 6 and more the body is unable to produce (synthesize) any vitamin D.*

As we detailed in our chapter about sunscreen, there is a mountain of evidence that details the unhealthiness of the sun-absorbing chemical active ingredients, synthetic preservatives, colors, and fragrances traditional sunscreens contain. If you have to use a sunscreen, why not use a certified natural sunscreen that bathes your skin in natural bioactive antioxidants? It's a safer, healthier, and more protective option with no negative consequences.

Won't I increase my risk of getting skin cancer if I get too much sun?

Not necessarily. When sun exposure is approached with intention, awareness, and common sense and then combined with natural internal and topical bioactive antioxidants, like those used in MelanSol® 100% Natural Skin Care, the sun becomes your greatest resource for building and maintaining a top-notch immune system. And your skin will be healthy and look fantastic as well.

The question we ask time and time again is, *why haven't skin cancer rates decreased as sunscreen use has increased?* It could be because people's awareness has increased, leading to more doctors' visits and more diagnosis. It could also be because traditional sunscreen use has exploded. The chemical active ingredients these sunscreens contain contribute to the development of non-melanoma skin cancer.

If the sun is so great, why do so many organizations tell us to use sunscreen every day to protect our skin?

The quick answer would be--follow the money. The sun-protection

industry is worth billions, and people respond more to a message about what they should avoid. The various organizations, doctors, and companies that continuously tell you to use sunscreen every day or risk suffering the consequences of advanced skin aging and skin cancer have a point—if you have fair skin and *if* you intend to expose your skin to sunlight for extended periods without using common sense or regard for your skin's tolerance for sun exposure.

What can I do to make sure I get my vitamin D while also protecting my skin?

Being aware of what causes skin damage and knowing your skin's limitations during sun exposure gives you the power to take control of your skin's health. Resorting to high SPF sunscreen is not the answer because it gives you a false sense of security, often leads to over-exposure, and blocks your body's ability to produce vitamin D.

What's the best way to determine my sun exposure limits?

Every skin pigment has different limitations during sun exposure. Do you know your limits? The best way to find out is by exposing your skin to sunlight, *without* sunscreen, during the heat of the day for the purpose of determining when your skin begins to experience the first signs of stress—pink skin or, in the case of medium skin pigments, tender skin. Once you know this period of time, you should, as a rule thumb, only expose your unprotected skin to sunlight for half this period (in order to avoid sunburn). This is also the formula for determining your personal SPF (see our chapter on SPF). Once you know approximately how long you can remain in the sun before experiencing sunburn, you can use this period to safely get your vitamin D. It is important to conduct this test in the area where you live or plan on getting the majority of your vitamin D.

How can I increase my natural skin protection during unprotected sun exposure?

You can increase your body's natural sun protection in two ways: by increasing your skin's production of melanin (skin pigment or tan) ahead of lengthy sun exposure and by applying or consuming topical and oral antioxidants.

Increasing your skin's melanin production isn't difficult, if your skin is capable of tanning. In fact, as UV levels rise coming out of winter, and as you casually expose your skin to sunlight, your skin's melanin production kicks in naturally.

Boost your skin's protective capabilities and keep your skin healthy and unharmed by eating antioxidant rich foods, adding beta-carotenoids to your diet, and taking super-antioxidant supplements, like astaxanthin (Hawaiian red algae) and Astaxanthol (see a more complete explanation of Astaxanthol in our chapter on antioxidants).

Topically, bathing your face and body with powerful natural antioxidants, like those found in MelanSol® 100% Natural Moisturizer while exposing your skin to sunlight can help prevent free radical damage. The thing to remember is that you should only expose your skin to sunlight for periods that fall within your normal limits for sun exposure, as outlined previously.

For more complete information about antioxidants and how they can help protect your skin during sun exposure, please see our chapters on antioxidants and Astaxanthol.

If I have darker skin, are my vitamin D needs different than someone who has fair skin?

Yes. People of color (medium to dark skin pigmentat ion) already have a built-in sunscreen—their melanin or skin pigment. Darker skin filters sunlight, which protects it against sunburn and skin aging. This enhanced natural protection is also a huge disadvantage when it comes to the synthesizing vitamin D. Because darker skin pigments do the job of a sunscreen, filtering high percentages of ultraviolet light, they require longer periods of sun exposure than fair skin to synthesize the same amount of vitamin D. This is the main reason why people of color should use sunscreen only when the intention is to stay in the sun for an extended period of time. Below is our Skin Type Chart again for your reference. It includes our guidelines for people of color.

Skin types and recommended MelanSol® products

Skin Type*	Sunburn Tendency	Tan Tendency	Skin, Hair, and Eye Color	Recommended MelanSol® Product
I	Always burns	Never tans	Fair skin (extremely sensitive), freckles, blond or red hair, blue or green eyes	100% Natural Sunscreen Lotion SPF-30
II	Always burns	Sometimes tans	Fair skin (very sensitive), blond hair, blue or green eyes	100% Natural Sunscreen Lotion SPF-20(**)
III	Sometimes burns	Always tans	Caucasian skin (sensitive), usually blond to dark hair, green or brown eyes	100% Natural Sunscreen Lotion SPF-20(**)
IV	Rarely burns	Always tans	Mediterranean, Hispanic, Asian, olive skin (moderately sensitive), dark hair, brown eyes	100% Natural Sunscreen Lotion SPF-10
V	Almost never burns	Tans deeply	Middle Eastern, Latino, Indian, light-skinned blacks (minimally sensitive)	100% Natural Sunscreen Lotion SPF-10
VI	Never burns	Deeply pigmented	Markedly pigmented black skin (not sensitive)	100% Natural Moisturizing and After Sun Lotion

(*Source: Fitzgerald, 1975) ** Visiting areas closer to the equator might require using the next higher SPF. For sporting activities and playing in water, fair skin should use the SPF-30.

How can I benefit from getting the proper amount of vitamin D?

According to Ty Vincent, M.D., author of **Think Outside the Pillbox, Vitamin D3**, also referred to as *cholecalciferol*, is vital to immune function both in terms of immune defense and immune tolerance. In regards to immune defense, vitamin D has been shown to dramatically improve resistance to infection from both bacteria and viruses (colds and flu), as well as defending against and killing many types of killing cancer cells within the body. In the case of immune tolerance, vitamin D has been shown to significantly improve both allergies and autoimmune diseases of many different varieties, including, multiple sclerosis and rheumatoid arthritis.

As we stated earlier, sunscreen directly impacts your immune system because it blocks the most important ingredient for synthesizing vitamin D—UVB light. This direct connection is the reason we have included a dialogue about vitamin D in a book about sun care.

The conversation about the sun needs to be more about having a symbiotic relationship than one about fear, avoidance, and using copious amounts of sunscreen. People in our society lead a more sedentary lifestyle,

spend more time indoors than out, and fear going outside because their medications make their skin more sensitive to sunlight.

We have spoken to hundreds of people over the years who fear going outside because they firmly believe it is the worst thing they can do for their skin. These fears, and the actions they lead to, are not only overblown, but also downright harmful to your overall health. A British study¹ concluded that UVB light was actually instrumental in the prevention of Melanoma, a deadly form of skin cancer. Although more research is necessary, what we now know is that the sun is more important to our health than we are being led to believe. In fact, your long-term health depends on it!

At the end of this chapter, we have listed several excellent books about vitamin D and a link for the Vitamin D Council. Get the facts and make your own decisions. These resources go into great depth about the great benefits of vitamin D and will certainly increase your understanding of the health crisis you face if you fear and avoid sun exposure or use sunscreen every time you expose your skin to sunlight.

We can only come to one conclusion: the health benefits of exposing our skin to the sun far outweigh the message of skin aging and skin cancer that is continually pounded into our heads by those who financially benefit from this message. This line of thought is echoed by Dr. Marc Sorenson, author of **Solar Power for Optimum Health**, who during a radio interview said, *The message about avoiding the sun is counter to maintaining optimum health*. The key is to approach and use the sun with great respect.

Where can I find out more about vitamin D?

Here are some of the best resources we have found about vitamin D and its impact on the body:

The Vitamin D Council website—www.vitamindcouncil.org

The Vitamin D Solution, a book by Michael F. Holick, Ph.D., M.D.

How Come They Are Happy and I Am Not, a book by Dr. Peter Bongiorno, ND, Lac

(The connection between Vitamin D deficiency and depression)

<http://www.drpeterbongiorno.com/books.htm>

Solar Power for Optimum Health, a book by Dr. Marc Sorenson
<http://www.vitaminddoc.com/bkproducts.html>

The Vitamin D Cure, a book by James E. Dowd, M.D.
<http://www.drjamesdowd.com/>

¹British study--[Br J Dermatol](#). 2009 Sep;161(3):630-4. doi:
10.1111/j.1365-2133.2009.09299.x. Epub 2009 Jun 9., and
<http://www.ncbi.nlm.nih.gov/pubmed/19519827>

Chapter 8

Quick Sun Care Q & A

Q. What is the cause of sunburn?

A. Each time you expose your skin to direct or indirect sunlight, free radicals form in your skin. *Sunburn*, also referred to as *oxidative stress*, occurs when the accumulating free radicals exceed your body's natural ability to neutralize them. The pink and red skin you experience is your skin cells filling with blood, a sign that they are under tremendous stress.

Early skin aging is the result of continuous free radical damage, non-melanoma skin cancer being the most advanced form of damage, when free radicals have mutated the DNA of your skin cell.

Q. Why should I use sunscreen?

A. Sunscreen filters the UVA, UVB, and UVC light spectrum. If you intend to expose your skin to sunlight for an extended period, sunscreen filters a high percentage of the sunlight you encounter, which will allow you to remain in the sun for a longer period.

Q. What kind of sunscreen provides the best overall protection?

A. By far, the best overall sun protection is provided by sunscreens that combine natural physical active ingredients, such as zinc and titanium dioxide, with potent combinations of natural bioactive antioxidants to counter the development of free radicals that age skin and cause non-melanoma skin cancer.

Q. What other ways can I protect my skin during sun exposure?

A. You can also build up your internal protection by eating antioxidant and beta-carotene-rich fruits and vegetables and taking supplements rich in super-antioxidants, such as astaxanthin or Astaxanthol. Wearing long sleeve shirts and long pants that block UV light, enclosed shoes, and hats with wide brims should also be part of your sun care plan.

Q. What is the number one mistake people make when encountering UV light?

A. Their greatest mistake is not paying attention to the way their skin reacts in sunlight. Your skin gives you signals—varying shades of redness and tender skin—when it has reached its tolerance for sun exposure. Being alert to these warning signs and heeding them is crucial to protecting your skin from overexposure that can lead to sunburn and longer-term skin damage.

Q. What miscalculation do people make when encountering more intense UV light in a climate that their skin isn't used to?

A. Mistakenly believing high SPF sunscreen will equalize their skin with a more severe UV environment. There is no way your skin can acclimate to a more intense UV light during a short vacation.

Q. Can wearing sunscreen help prevent skin cancer?

A. There are two distinctly different forms of skin cancer—*melanoma* and *non-melanoma*.

Melanoma skin cancer is a lethal form of skin cancer. Its direct cause is still unknown. As of this writing, a British study¹ concluded that an absence of exposure to UVB light may be a contributing factor to its development. That may have something to do with vitamin D, which is produced by the body when skin is exposed to UVB light. Sunscreen blocks the body's ability to produce vitamin D.

Non-melanoma skin cancer—basal cell and squamous cell carcinoma—manifests through cellular DNA mutations as a result of free radical damage. Potent natural antioxidants as part of an all-natural sunscreen formula are crucial because they act to neutralize free radicals before they damage skin cells.

Q. What is “certified natural”?

A. The Natural Products Association (NPA), located in the USA, has a *Natural Seal* certification program that provides independent certification of natural products' ingredients. A manufacturer must surrender its complete formula to the NPA. The NPA then gets a certification from each ingredient

supplier to assure that the ingredient, and the way it was processed before being formulated into the product, is completely chemical free. The NPA is the only organization in the US to certify natural product ingredients.

Q. Why do sunscreens burn your eyes?

A. When sunscreens burn your eyes, the main culprits causing the burning are the chemical active ingredients used to absorb UV light. These active ingredients ignite into a chemical reaction of heat when applied to your skin. This reaction causes the burning when they get into your eyes. Other chemicals in these sunscreens can also cause burning in your eyes. These chemicals include alcohol, parabens, glycols, synthetic preservatives, colors, and fragrances. Certified natural sunscreens, like MelanSol® and others, cause no burning sensation in your eyes.

Q. Does the FDA approve sunscreens?

A. The FDA does not approve products. A product only has to be compliant with FDA regulations. As of 2013, new FDA rules and regulations for testing and labeling sunscreens will go into effect, causing all to comply.

Q. Are sunscreens safe for the environment?

A. The only environmentally safe (reef safe) sunscreens are those that are *certified natural*. The vast majority of the sunscreens sitting on the shelves of brand-name retailers and convenience stores contain chemical active ingredients that pollute oceans, lakes, rivers, and streams.

An Italian university sunscreen study revealed that 4,000 to 6,000 metric tons of chemical sunscreen washes into the world's oceans each year and can bleach coral in about four days. Chemical UV filters behave, in most cases, like strong estrogen and have demonstrated hormone activity in lab tests. We advocate using only *certified natural* sunscreens when engaging with nature in any way. (Italian study reference: *Danovaro, R et al. (2008) Sunscreens cause coral bleaching by promoting viral infections. Environmental Health Perspectives, 116: 441-447.*)

Q. Should pregnant and breast feeding women use sunscreen?

A. A percentage of everything you put on your skin enters your body, so

pregnant women should not use chemical sunscreens because of the chemical active and inactive ingredients they contain. We advocate that pregnant women should avoid all chemical skin care, especially sunscreen and use only certified natural sunscreens when UV protection is required.

Two separate University of Zurich studies confirmed the presence of five different sunscreen chemical active ingredients in mother's breast milk. A summary of the breast milk study we are referring to can be found at the following link:

http://journalclub.tox.ncsu.edu/linked_files/fall_05/schlumpf_04.pdf

Q. How is sunscreen different from sunblock?

A. As per FDA regulations established in 2013, sunscreens can no longer be identified as a *sunblock*, because the term overstates their effectiveness.

Q. What are the healthy benefits of certified natural sunscreen?

A. Certified natural sunscreens focus on protecting your skin from overexposure to UV light without the use of chemical active or inactive ingredients. They rely exclusively on mineral active ingredients zinc oxide and/or titanium dioxide, which lay on top of your skin to reflect or scatter UV light.

The newest generation of certified natural sunscreens is certified by the Natural Products Association (NPA) and additionally contain large doses of natural bioactive antioxidants (MelanSol®) to control free radicals that cause sunburn, skin aging, and non-melanoma skin cancer.

Q. How should sunscreen be applied?

A. Generously! A rule of thumb is one ounce of sunscreen per person for the entire body, during lengthy exposure. The most effective way to get an even application is by applying the sunscreen to your fingertips, rubbing your hands together for even distribution, and then applying it to the various areas of your body that you desire to protect.

Q. Why do they instruct us to apply sunscreen 20 to 30 minutes before sun exposure?

A. The vast majority of sunscreens on store shelves contain chemical active ingredients. Because these ingredients use a chemical reaction of heat to absorb UV light, they need 20 to 30 minutes for the reaction to reach its full absorbing capacity. If these sunscreens are applied after arriving at your desired location, as is the case with sunscreen sprays, no UV light will be filtered for at least 20 to 30 minutes. If this occurs during the heat of the day, in a geographic location where UV rays are really intense, a person with fair skin could experience sunburn before the sunscreen starts working.

Q. Are there any sunscreens that start protecting immediately after they are applied?

A. Contrary to what is required to be put on the sunscreen back label, sunscreens that have zinc oxide and/or titanium dioxide as active ingredients work immediately after application. There is no need to apply these sunscreens 20 to 30 minutes before sun exposure.

Q. Why do I have to re-apply sunscreen?

A. *Sunscreens* that list chemicals as their active ingredients need to be re-applied because these chemicals are unstable and begin to decay in a few hours. They need to be re-applied to keep the process of absorption going while you are still exposed to sunlight. They should also be re-applied after exiting water and after washing or wiping them off.

Certified natural sunscreens that list zinc oxide and/or titanium dioxide as their sole active ingredients lay on top of your skin and should be re-applied after exiting water and after they are washed or wiped off.

Q. What is a “free radical”?

A. Free radicals, also referred to as reactive oxygen species (ROS), are charged molecules formed when skin is exposed to UV rays. They are also formed when chemical compounds like chemical active ingredients used in traditional sunscreen are activated by UV light energy (breaking its double bond to produce two free radicals).

Free radicals attack healthy cells and react with other molecules, damaging collagen and elastin, fats, proteins, and the DNA of the cells. The most immediate form of free radical damage you experience is sunburn. Over time, free radical damage is revealed as wrinkles, premature skin aging, sunspots, and non-melanoma skin cancer.

Q. What is an antioxidant?

A. Antioxidants act as cell protectors and are capable of counteracting the damaging, but normal, effects of oxidation (free radical generation) in tissues. Antioxidants counteract free radicals by binding with them before they can damage skin cells.

Q. What is Bio-Melanin?

A. Melanin is an antioxidant naturally present in the skin to protect it from sunlight damage. The antioxidant Bio-Melanin used in the MelanSol® formula is real date phytomelanin, a dark brown pigment, extracted from the fruit of the date palm. Melanin protects the date fruit from intense solar radiation found in the desert environment. Bio-Melanin, a dynamic *super* antioxidant and free radical scavenger, has a 1,000 times greater capacity than vitamin E for capturing and terminating free radicals.

Q. What are nano particles?

A. Nano-size particles or pigments are smaller in size than 100 nm (nanometer). Several studies in Europe and here in the US have shown that the nano-sized particles do not penetrate the skin. Zinc oxide is the most effective UV filter and covers the whole spectrum: UVB, UVA-1, and UVA-2.

Q. Is the vitamin E used in skin care products all the same?

A. No. The most natural and most effective form is *vitamin E- mixed d-tocopherol*. This form of vitamin E is much more bioactive (having a greater ability to capture free radicals on your skin) than any other form. Natural vitamin E also stays in your system for a longer period of time. In most sunscreen and skin care products, the synthetic form *dl-alpha tocopherol* is used, a form that is much less capable of fighting free radicals that develop on your skin.

Q. Is UPF or SPF clothing better than regular clothing?A. There is no doubt that Ultraviolet Protection Factor (UPF) and Sun Protection Factor (SPF) clothing give your skin a higher degree of protection against ultraviolet light. Stringent testing standards assure you are getting what you pay for. If you have fair skin and spend a lot of time in the sun-- boating, working, gardening, etc., using UPF/SPF clothing has its benefits. Aside from their increased ability to filter UV light, this clothing is technologically designed to be lighter, provide more comfort, keep you cool, and wick away moisture.

Because this high tech clothing can tend to run on the expensive side, we recommend assessing your needs, then adding a piece or two to your wardrobe that will give you the most bang for your buck. For example, having a long sleeve white shirt that converts to a short sleeve shirt above the elbows gives you two shirts in one. Pants that perform the same protective function by converting to shorts are also available.

Although there are technologically sound reasons for using UPF & SPF sun protective clothing, don't sweat it if your wardrobe doesn't include them. Your skin will not suffer any more damage by wearing what you have now. Stick to light colored long sleeve shirts and long pants in light summer fabrics, wide brim hats that shade your face and ears, and shoes that can completely cover your feet on hand and you'll be just fine.

Here is a great resource for learning more about sun protective clothing.

http://en.wikipedia.org/wiki/Sun_protective_clothing

Q. Can sunburn still occur on a cloudy summer day?

A. Yes! The intensity of ultraviolet light is not blocked by clouds. If you intend to expose your skin to the sun on a cloudy summer day for a lengthy period, we recommend applying certified natural sunscreen and having appropriate sun protective clothing on hand.

Q. Is there organic sunscreen?

A. No, for the following reasons:

- Products labeled "organic" must contain a minimum of 95% organic ingredients (certified), and the remaining 5% must comply with certain restrictions, including no genetically modified

organisms (GMO). US Department of Agriculture regulates the term “organic” and provides for certification that agricultural ingredients have been produced under conditions that enhance the ecological balance of natural systems. The concentration of the active ingredients in natural sunscreen products that are either titanium dioxide or zinc oxide are more than 5%. These ingredients are natural source pigmented mineral. They are “natural” but not “organic” as per this definition. A few organic ingredients in a sunscreen do not make a product “organic.”

- The term “natural” is not regulated, and there isn’t any enforceable standard. The Natural Products Association (NPA) has set up a Standard and Certification for Natural Personal Care Products. The NPA awards its Natural Seal only to those sunscreens that have met its stringent qualifications (ingredients that come or are made from a renewable resource found in nature (flora, fauna, mineral), with absolutely no petroleum compounds, NO artificial colors, flavors, preservatives, or other chemical additives). The NPA makes sure that each ingredient (including the active ingredients), and the way the ingredients are processed, are truthfully natural.
- Only a product that carries the “Natural Seal” on the packaging offers a guarantee that the product, as such with all its ingredients, is truthfully natural and safe for humans and the environment.

¹British study source: <http://www.ncbi.nlm.nih.gov/pubmed/19519827#>,
<http://www.ncbi.nlm.nih.gov/pubmed/19519827>

Chapter 9

The MelanSol[®] Story

The greatest inventions in history were intuited because of some form of challenge or adversity that needed to be overcome. Sunscreen was not originally conceived to give people the opportunity to tan or wear fewer clothes in warmer climates. It was invented to help prevent light skin from being damaged after extreme exposure to heightened levels of ultraviolet light in high altitude and tropical areas.

Sunscreen is simple in concept. It's defined as any formula containing FDA-approved *active ingredients* that filter specific segments of the UV light spectrum, either by absorbing the sun's heat energy or scattering and reflecting its light.

The first commercial sunscreen was invented in 1922, and in spite of the facts about how skin damage occurs and studies exposing how chemical active ingredients are ineffective at preventing photo aging skin damage (free radical damage), there had been no significant innovation in sunscreen until Peter Zahner's antioxidant discovery.

Peter suffered from basal cell and squamous cell carcinoma skin cancer and desperately wanted to do something that would prevent him from having surgery year after year. In spite of his dermatologist's recommendation to use high Sun Protection Factor (SPF) sunscreen to prevent its return, his skin cancer did return.

Not unlike many people, Peter spent a lot of time running around the countryside of Switzerland and traveling to tropical areas during his younger years. Unfortunately, many years later, he discovered that having too much fun in the sun can have negative consequences.

Peter's increasing frustration with having frequent surgery to have skin cancer removed led him to look deeper into why his problem persisted and what, if anything, could be done to stop it from returning.

His investigation revealed a trend—skin cancer rates had risen in areas where there was excessive sunscreen use. He thought this was partly because sunscreen users were being lulled into a false sense of security, extending their

time in the sun because they were confident sunscreen would prevent their skin from being damaged.

The light bulb went off in Peter's head when he realized his sunscreen was contributing to the progression of his non-melanoma skin cancer by generating the same harmful free radicals on his skin as those that developed when it was exposed to UV light.

The antioxidant innovation that formed the foundation of his line of moisturizer, sunscreen, and sunburn relief emanates from a well-known fact—skin-damaging free radicals can be neutralized by natural antioxidants that have a high capacity for capturing and eliminating free radicals. All Peter had to do was find a combination of natural antioxidants with bioactivity—the ability to work continuously throughout the day to protect skin cells from free radical damage.

As necessity is assuredly the mother of invention, Peter eventually discovered the right combination of natural antioxidants and included them in his line of sunscreen, moisturizer, and sunburn relief formulas that go far and beyond the protective abilities of traditional sun care products. He named his brand MelanSol® and had all of the ingredients he uses certified natural by the Natural Products Association.

Peter is often asked why he formulates sunscreens with Sun Protection Factors (SPF) between 10 and 30. He doesn't see sunscreen as a one-type-fits-all concept. During extended UV exposure, someone with fair skin would need more UV light filtering—SPF 20-30—than someone with a darker skin pigmentation—SPF 10.

Another question Peter is asked is this: *Why are there so many ingredients?* In all, he includes 26 assorted natural ingredients. His answer is a simple one. Many of the ingredients perform functions that support skin health during and after sun exposure, such as hydration, nourishment, anti-inflammatory, conditioning, rejuvenation, and helping skin repair. Other ingredients support the stabilization and preservation of the skin care formulas.

What Peter was not prepared for were the additional benefits people tell him his formulas provide, which include peace of mind from knowing you are doing something healthy for your body, no eye irritation of any kind, knowing you are not negatively impacting the environment, and skin care formulas that allow people with UV light sensitivity to experience sun again in a positive way.

Peter's MelanSol® Sunburn Relief Gel is a formula that helps skin recover from sun exposure, sunburn, and various forms of skin irritation. Mother's also tell us it's perfect for baby's sensitive skin.

Chapter 10

Michael J. Russ: My Story

People are always amazed that I am an African American in the sun care business. What never ceases to amaze me, however, is how many misconceptions people have about sunscreen. People really don't understand the intricacies of sunscreen and are often dumbfounded by the sheer number of choices available to them and confused about which one is right for them. This issue is compounded when you have medium to dark skin.

There is very little conversation about how people of color should interact with the sun, which probably accounts for the high rates of vitamin D deficiency among this segment of the population. Before I became involved with the MelanSol® brand of all-natural sunscreen and moisturizer, I was just as misinformed about sunscreen and, as I would come to find out, vitamin D deficient. When I became aware of the importance of vitamin D and had my doctor test for it, I discovered my vitamin D level was 30ng (nano-grams). I was shocked because doctors I've interviewed on our radio show said you should have a minimum vitamin D level of 50ng to fight colds, influenza, and disease. My vitamin D deficiency forever changed my relationship with the sun. It went from being something I avoided or put up with, to a tool I actively used to build and maintain a healthy immune system.

When I was in my mid-20s, I would vacation in Hawaii for a week or two every year. I never used sunscreen, never experienced sunburn, and would turn three shades darker before coming home. Now, years later, when I go to the tropics, Hawaii, Mexico, Brazil, the Caribbean, or any location closer to the equator, certain areas of my body are at risk of being sunburned by the intense UV levels until my skin's melanin production kicks in to protect me. While at home in north Florida, MelanSol® certified natural moisturizer is my only skin protection.

My situation is not unlike that of any other person of color, whatever the pigmentation—or anyone with an ability to tan—who wants to have a good time in the sun at home or when visiting a sunnier region of the world without getting burned.

Like most people on vacation, I find that the areas of my body most at risk are my chest, back, and upper thighs, which usually don't see the light of day for many months at a time. In these areas, although my skin's production of melanin can be robust, it's just not been stimulated yet via exposure to sunlight. I am often asked how I protect my skin during a transition to a hotter climate.

When transitioning to hotter climates, where I intend to spend more time in the sun, I keep two things in mind:

1. Expecting my skin to fully acclimate to a harsher sun in a tropical environment is unrealistic. It can often take several months for this to happen.
2. My skin has the melanin to protect itself. I must be patient and smart about how I reveal less frequently exposed areas of my body until my skin's production of melanin in those areas has been ramped up.

With these points in mind, my MelanSol® sunscreen protocol is usually as follows:

- A. A month ahead of leaving, I increase my daily intake of the Astaxanthol® antioxidant formula and antioxidants in my diet, to build my internal skin protection, and begin to expose areas of my body that don't normally see the light of day to sunlight for short periods, to stimulate melanin production.
- B. After arriving at my destination, for the first two days, I am careful about the amounts of time I reveal to sunlight the areas of my body that see the least sun back home. I limit that exposure to about an hour and a half. During these periods, I use a higher sunscreen SPF than I normally would, like MelanSol® SPF 20. After day three, I can usually decrease to an SPF of 10.
- C. On the areas of my body that have developed a higher level of tan (melanin production) due to constant exposure back home, I apply MelanSol® SPF 10 (90% UV reflection) until this skin acclimates to the higher intensity of UV light, after which, I switch to MelanSol® certified moisturizer, which contains the bioactive antioxidants my skin needs to prevent skin damage.

D. I always have a light colored long sleeve shirt, usually thin cotton or linen, on hand to use when walking around the resort and a long billed light colored golf hat is always on my head.

I hope my sun care protocol serves as an example of how easy it can be to put together a sun care plan for you and your family; a little bit of awareness and effort in the short term, can save your skin from being damaged in the long-term. Everyone wants to have good looking skin. It doesn't take much to achieve it, once you have a daily sun care routine that honors your skin and uses the sun to build and support a vibrant immune system.

Chapter 11

ASTAXANTHOL: Powerful, “Internal” Sun Protection by Mitchell A. Fleisher, M.D., D.Ht., D.A.B.F.M.

ASTAXANTHOL is a uniquely designed, nutraceutical formulation that is an extremely potent, highly bio-available, broad spectrum, anti-inflammatory complex that provides significant, anti-aging protection for the brain, eyes, heart, blood vessels, joints, skin, and all cells, tissues and organs from injury by free radical-induced oxidative stress, especially that produced by toxic chemicals and ultraviolet (UV) solar radiation.

The active ingredients, **astaxanthin** and **Seanol-P**, are extremely powerful carotenoid and bioflavonoid lipophilic (fat soluble) antioxidants, respectively, which easily penetrate into all body cells, and serve to both prevent and repair free radical-induced oxidative stress damage to the infrastructure of the brain, heart, and all vital organs, joints, and skin. It will help protect the eyes from UV solar radiation and preserves visual acuity. **Gamma-Linoleic Acid (GLA)** is an omega-6 essential fatty acid that is very important for helping to control inflammation and support healthy skin.

ASTAXANTHOL also represents a new, highly effective form of “internal” sun protection.

Many commercially available sunscreens contain potentially toxic chemicals, such as retinyl palmitate or retinol, which when exposed to sunlight may exhibit photo-carcinogenic (pro-skin cancer) properties that can damage the skin more than protect it.

Topical sunscreens can also inhibit the production of the critically important anti-cancer nutrient vitamin D3 (cholecalciferol) by preventing the activation by sunshine of the metabolic pathways in the skin. Vitamin D3 is produced by UV solar activation of its precursor 7-dehydrocholesterol, which occurs naturally in the skin of animals.

ASTAXANTHOL does not block sunlight from activating vitamin D3 production. Instead, it prevents and repairs free radical-induced oxidative

stress generated by UV solar radiation by protecting the skin from within.

How It Works:

Astaxanthin is the most potent, lipophilic, carotenoid antioxidant found in nature. It is more powerful than beta-carotene, alpha-tocopherol, lycopene, and lutein, other members of its chemical family. A primary source is the microalgae *Haematococcus pluvialis*. When its water supply dries up, it must protect itself from ultraviolet radiation. It produces astaxanthin as its survival mechanism, which serves to protect the algae from lack of nutrition and the intense solar UV radiation.

Astaxanthin is readily soluble in lipids, so it incorporates into all cell membranes.

Astaxanthin exhibits extremely powerful, free radical scavenging activity, and helps to protect all cells, organs and body tissues from oxidative stress damage and inflammation. Astaxanthin is a potent UV-B (solar ultraviolet light) absorber and reduces damage to the chromosomes, genes, and DNA inside cells.

Astaxanthin is a very potent, natural anti-inflammatory agent. It has been shown to suppress several different inflammatory mediators, including tumor necrosis factor alpha (TNF-a), prostaglandin E-2 (PGE-2), interleukin 1B (IL-1b), and nitric oxide (NO).

Astaxanthin is 65 times more powerful than vitamin C, 54 times more powerful than beta-carotene, and 14 times more powerful than vitamin E.

Astaxanthin is far more effective than other carotenoids at singlet oxygen quenching, a particular type of free radical oxidation. The damaging effects of UV solar radiation, and various organic toxins, are caused by this less-stable form of oxygen. Astaxanthin is 550 times more powerful than vitamin E and 11 times more powerful than beta-carotene at neutralizing singlet oxygen free radicals.

Astaxanthin crosses the blood-brain barrier and the blood-retinal barrier (whereas, beta-carotene and lycopene do not), which brings antioxidant and anti-inflammatory protection to the brain, central nervous system, and eyes, and reduces the risk for Alzheimer's disease, dementia, cataracts, macular

degeneration, and blindness.

Human clinical research studies involving common inflammatory disorders, e.g., carpal tunnel syndrome, tennis elbow (lateral epicondylitis), exercise-related joint soreness, and rheumatoid arthritis, demonstrate the effectiveness of astaxanthin:

- Carpal tunnel syndrome (CTS), a common, repetitive stress injury: CTS is a debilitating condition of the wrist that manifests as numbness, pain, and sometimes paralysis of the hand and fingers. A study by the Health Research and Studies Center found eight weeks of astaxanthin supplementation resulted in significant pain reduction, both in terms of severity and duration, leading researchers to conclude that astaxanthin might be a viable alternative to surgery.
- Tennis elbow (lateral epicondylitis): caused by inflamed tendons, tennis elbow results in pain and decreased grip strength when gripping something with your hand. Another study by the Health Research and Studies Center involved giving patients with tennis elbow an eight-week course of astaxanthin. The treatment group showed a 93% improvement in grip strength, as well as decreased pain.
- Post-exercise joint soreness: In 2001, Dr. Andrew Fry of the University of Memphis studied the effects of astaxanthin on healthy individuals who trained with weights, who would typically experience exercise-induced joint soreness. Dr. Fry gave young male subjects astaxanthin for three weeks, during which time they performed strenuous workouts. He then re-evaluated them for knee pain. The placebo group experienced post-training knee soreness lasting up to 48 hours after their workouts. However, the treatment group who received astaxanthin exhibited no increase whatsoever in knee joint soreness following workouts. [Fry, A. (2001) “*Astaxanthin Clinical Trial for Delayed Onset Muscular Soreness.*” Human Performance Laboratories, The University of Memphis, Report 1, August 16, 2001.]
- Rheumatoid arthritis (RA): After receiving astaxanthin supplementation for eight weeks, RA patients showed a 35% improvement in pain levels, as well as a 40% improvement in their ability to perform range of motion and daily activities [*Journal of the American College of Nutrition.* 21(5): Oct, 2002.]

A recent study of astaxanthin's neuroprotective capacity was done at Nagoya University in Japan. Human brain cells were subjected to an oxidative stress-induced neuronal cell damage system. Significant protection was demonstrated in cells pre-treated with astaxanthin. In addition, pre-treatment with astaxanthin inhibited the generation of reactive oxygen species. The authors concluded, "The neuroprotective effect of astaxanthin is suggested to be dependent upon its antioxidant potential and mitochondria protection; therefore, it is strongly suggested that treatment with astaxanthin may be effective for oxidative stress-associated neuro-degeneration and a potential candidate for natural brain food."

Astaxanthin has also been demonstrated to contribute to cancer chemoprevention and antitumor activity in animals and humans, as well as to improve male fertility and preserve the cosmetic properties of the skin via protection from sun damage.

The most recent study of astaxanthin's neuroprotective capacity was published in the British Journal of Nutrition, which assessed the efficacy of astaxanthin supplementation in the prevention of dementia. The 12-week study included a total of 30 middle-aged and senior participants who were assigned to receive either 6 or 12 mg astaxanthin or placebo daily. The results revealed that after 12 weeks, those who consumed astaxanthin had markedly lower levels of PLOOH (free radical compounds that accumulate abnormally in the red blood cells and are thought to contribute to dementia). Levels of PLOOH were 40 and 50% lower, in the 6 and 12 mg groups, respectively, compared with no significant change in the placebo group. Based upon these findings, the researchers concluded that astaxanthin reduces levels PLOOH, which may lower the risk of dementia.

Another recent study examined the effect of astaxanthin supplementation in overweight and obese adults. The study included 23 adults with BMI of greater than 25 who were randomly assigned to receive either 5 mg or 20 mg of astaxanthin daily for three weeks. Oxidative stress biomarkers were measured at baseline and then again one, two, and three weeks after astaxanthin supplementation. At the end of the study, it was found that both groups saw marked increases in levels of the body's own antioxidant defenses, as well as significant decreases in biomarkers of oxidative stress. Although plasma concentrations of astaxanthin were higher in the group receiving 20 mg

per day, there were no significant differences in levels of biomarkers between the two groups. These findings suggest that 5 mg of astaxanthin may provide beneficial protection against oxidative stress in overweight and obese adults.

Seanol-P (SeaPolynol, *Ecklonia cava* extract) is the most powerful and long-acting natural antioxidant now known. Unlike virtually all of the land-based, “hydrophilic” (water-soluble) polyphenols, including catechins and EGCG from green tea extract, anthocyanosides from bilberry and blueberry extracts, proanthocyanidins from grape seed and pine bark extracts, etc., the effectiveness of Seanol-P is, in part, due to the fact that these sea-based, polyphenol-phlorotannin extracts contain large amounts of “lipophilic” (fat-soluble) and “hydrophobic” (water-insoluble) compounds. This gives Seanol-P the unique ability to be easily absorbed into and concentrated in all the cells of the body and also pass through the blood-brain barrier, thereby helping to protect and improve brain function, memory and mental clarity. In addition, the “lipophilic” (fat-soluble) properties of the special polyphenols in Seanol-P allow it to remain in the body of humans and other mammals up to 12 hours, in contrast to the very short, 30-minute half-life of the “hydrophilic” (water-soluble) land-based polyphenol sources. The ORAC score for antioxidation potential (8,300) of Seanol-P is significantly higher than most known land-based polyphenols. Phlorotannins are known to be potent antioxidants and anti-inflammatory agents that help to prevent and alleviate inflammatory and degenerative disorders of the central nervous system (CNS) and the entire body.

Seanol-P is rich in lipophilic polyphenol/phlorotannin complexes possessing long-lasting, extremely potent antioxidant, anti-inflammatory properties and is the result of over 14 years and more than \$35 million of focused developmental funding and research.

In addition, the lipophilic polyphenol/phlorotannin complexes in Seanol-P have a very long half-life, remaining in the mammalian metabolism up to 12 hours, as opposed to the brief, 30-minute half-life of the hydrophilic, land-based polyphenols. The ORAC score of Seanol-P for antioxidation potential of 8,300 units are significantly higher than those of most known hydrophilic, land-based polyphenols.

Depending upon the medical application examined, the in-vivo potency

of Seanol-P tends to be from 100 to 1,000 times more than a similar quantity of land-based polyphenols, resulting both from its higher antioxidant potential, as well as its 24 times greater metabolic half-life.

As a result of over 14 years of in-vitro, in-vivo basic science and human clinical research, Seanol-P has been proven to provide the following cardiovascular metabolic benefits:

1. Uniquely strong antioxidant scavenging of lipids, calcium and cholesterol, as well as free radicals from the cardiovascular system, thereby lowering the risk of cardiovascular events and stroke, lowering cholesterol levels, and reducing vasculitis-induced (inflammation of blood vessels) neuropathy.
2. Strong anti-plasmin inhibition effect, i.e., normalizes vascular blood flow, thereby lowering blood pressure and increasing arterial blood flow.
3. Strong elastase agonist effect, thereby increasing the flexibility of the vascular system and helping normalize blood flow and blood pressure.
4. Significant anti-inflammatory effect, by inhibition of the Nf-kB inflammatory pathway, which also serves to normalize blood glucose levels and lead to statistically significant re-establishment of insulin sensitivity in the pancreas, thus helping to prevent diabetes and its complications.

In another study, subjects were advised to ingest 6 capsules daily (3 capsules 2 hours before lunch, 3 capsules 2 hours after dinner) for eight weeks. Each capsule contained 100 mg of Seanol-P. Seanol-P improved all of the cholesterol parameters, along with reducing triglyceride levels.

Gamma-Linolenic Acid (GLA) is an omega-6 fatty acid that is found mostly in plant-based oils, and is especially concentrated in borage seed oil.

From GLA, the body forms dihomo-gamma-linolenic acid (DGLA), an anti-inflammatory omega fatty acid. DGLA is the precursor of the [prostaglandin](#) PGH₁, which in turn forms PGE₁ and the [thromboxane](#) TXA₁. PGE₁ has a role in regulation of [immune system](#) function. TXA₁ modulates the pro-inflammatory properties of the thromboxane TXA₂, thereby serving to help

control systemic inflammation.

GLA has been demonstrated to reduce inflammation in the joint and skin tissues, to significantly reduce pain in rheumatoid arthritis, to help control dermatitis, and preserve the moisture and smooth texture of the skin.

Recommended Indications:

- Help protect the brain, eyes, heart, blood vessels, joints, skin, and all cells, tissues and organs from injury by free radical-induced oxidative stress
- Help protect the eyes from UV solar radiation, and preserve visual acuity
- Help control common inflammatory disorders, e.g., carpal tunnel syndrome, tennis elbow (lateral epicondylitis), exercise-related joint soreness, and rheumatoid arthritis
- Help contribute to cancer chemoprevention and antitumor activity
- Help improve male fertility via enhancing healthy sperm function
- Help reduce free radicals in red blood cells and thereby possibly help prevent dementia
- Help optimize blood lipid (cholesterol and triglyceride) levels by decreasing VLDL and LDL cholesterol, as well as Lipoprotein A, and concomitantly increasing protective HDL cholesterol
- Help improve cardiovascular function via vasodilatation, hypotensive (blood pressure lowering) effects and enhancement of peripheral blood circulation
- Help protect against arteriosclerosis and atherosclerosis (hardening of the arteries), cardiovascular disease, cerebrovascular disease (stroke) and hypertension
- Help preserve the cosmetic integrity of the skin via protection from toxic chemicals, sun damage, and inflammation

Recommended Dosage:

One to two capsules daily, before or with meals, to support normal inflammation.

When used as an “internal” oral sunscreen to help prevent sunburns, take three to four vegi-capsules daily, depending on the duration and intensity of sun

exposure, and the fairness of the skin; the fairer the skin, the more that is necessary.

Astaxanthin is available from Progressive Labs, Inc., at (800) 527-9512. Use #7876 to order it for yourself and your family.

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