



InterClinical Laboratories Newsletter

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Season's Greetings

Welcome to our final newsletter for 2012. We have enjoyed a full and productive year and it is all thanks to our wonderful practitioners who work with us using our mineral analysis testing as well as our professional product range. We are busy planning next year's projects as we continue to strive to meet your clinical needs at the highest possible standards.

In this newsletter, we have highlighted one of our most versatile and unique products; the *Dunaliella salina* marine phytoplankton used in Algotene®. Practitioners recommend this incredible wholefood natural medicine to patients

with a wide range of health issues and we wanted to detail just some of its special qualities here. As the Summer season approaches, we hope to provide this fundamental product for your clients' health and safety in the sun.

You can also find inside this newsletter a profile of our next additional element; Vanadium. To find previous additional elements from this series, please go to our website and click on the 'Newsletters' tab, then 'Newsletter Archive'

Most importantly, we would like to take this opportunity to thank you for your patronage this year. From all of us here at InterClinical Laboratories, we wish you a healthy, happy and safe festive season and a prosperous 2013!

Dunaliella salina: Enhance your patient's protection from sun damage and prepare them for summer

Summer is coming and Australia is a great place to enjoy the sun, but it is also at high risk for UV damage to the skin. Due to Australia's location and our proximity to holes in the ozone above Antarctica, we are exposed to higher UV levels throughout the day, particularly in summer. We need sun exposure to stay healthy, as it provides the natural source for Vitamin D, however we also need to find protection where we can.

Dunaliella salina is a unique species of phytoplankton. It is a remarkable single cell algae. Although it is an ancient wholefood, some would say it is the next big 'superfood' natural medicine. As far as summer-supplements go, you could say that this algae is made from sunshine. *Dunaliella salina* is grown in the warm salt lakes off the coast of north-western Australia. It thrives in high amounts of UV exposure. By growing in clean, mineral-rich, marine waters, this algae is able to grow into one of nature's richest, most bio-available sources of natural beta-carotene and mixed carotenoids.

Praised for its many evidence-based benefits, *Dunaliella salina*'s 'summer uses' are listed below.

Sun protection with *Dunaliella salina*

It is important to be aware that people who are repeatedly exposed to high levels of UV light are actually suppressing their immune system¹. UV damage creates a situation of oxidative stress in the body and can leave you more susceptible to degenerative disorders like cardiovascular disease, stroke, cataract, macular degeneration and of course, skin cancer. *Dunaliella salina* contains a wealth of antioxidant vitamins, minerals, essential fatty acids and proteins that contribute to the

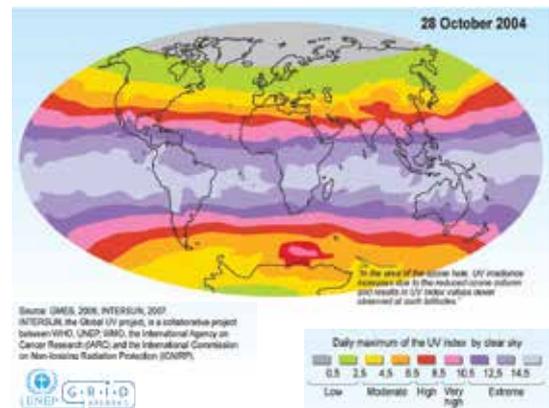
components of healthy skin cells².

In addition to these nutrients, it is the high amount of mixed carotenoids (in particular the beta carotene), which make it so protective against UV light. During its growth phase, *Dunaliella salina* is exposed to a high-UV environment and so it produces very high levels of the antioxidant beta-carotene to protect itself from its harsh growing environment³.

Dunaliella salina is an excellent source of safe and natural vitamin A, through the body's ability to convert beta-carotene to provitamin A, as required. In this way, the source of Vitamin A is a safe and non-toxic way to supplement with Vitamin A, even during pregnancy and lactation. Vitamin A is an essential nutrient for eye health and the immune system⁴.

Continued overleaf

The Global Solar UV Index (UVI)



This images indicates the levels of UV radiation at the Earth's surface. The higher the value, the greater the potential for damage to skin and eyes and the less time it takes for harm to occur.

Hair Tissue Mineral
Analysis Pathology

Nutritional, Herbal and
Natural Medicines

Practitioner Education

Research and
Development

Supplementing with beta-carotene is one of the ways you can protect yourself from UV damage, along with protective clothing, sunscreen and less hours in the midday-sun. A number of studies have found that elevated UV exposure reduces beta-carotene levels in the skin and that's why it is so important to be consistently replacing and rebuilding your beta-carotene levels. **In fact, high levels of beta-carotene and other mixed carotenoids in the body are believed to help increase our life-span potential** ⁵.

A study in 1998 revealed that supplementation with *Dunaliella salina* effectively raises the levels of beta-carotene in the skin⁶. When used in conjunction with vitamin E, beta-carotene helped to reduce erythema formation and also increased erythema suppression in the skin after UV exposure.

Natural and Synthetic beta-carotene are not the same

Beta-carotene comes in different forms or arrangements, called isomers. The natural beta-carotene source (as found in the *Dunaliella salina*) contains the 9-cis isomer and is one of nature's most powerful antioxidants. It also contains some all-trans isomers, which allow some of this beta-carotene to convert more readily into safe, non-toxic vitamin A.

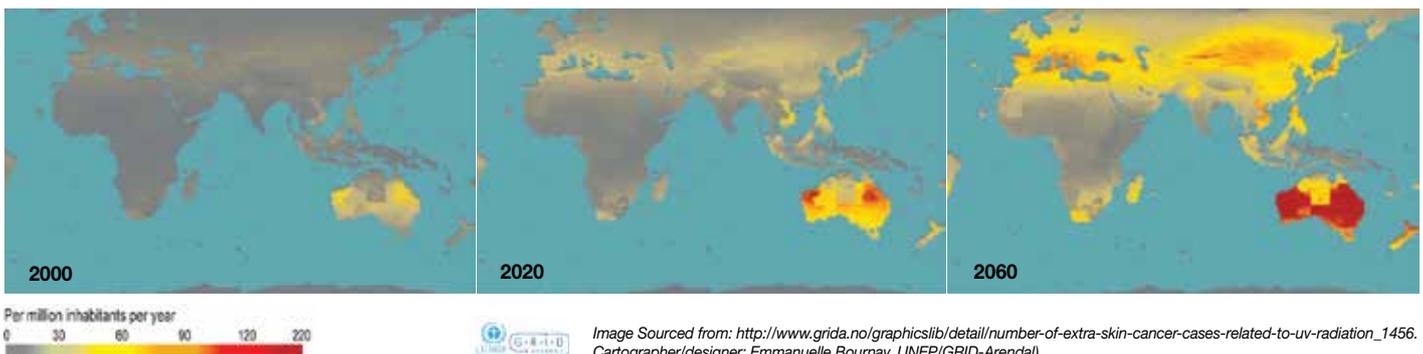
Synthetic forms of beta-carotene contains only the all-trans isomer, allowing it to readily convert to vitamin A, which is important for immunity and eye health, but in high doses has the potential for toxicity. It is for this reason that a natural beta-carotene source (which also contains the 9-cis isomer form) is safer and is a more potent antioxidant ⁷.

Metabolic Syndrome and those winter kilos

Even though we all know it can happen, winter still seems to be the time where we or our clients are prone to putting on a few extra kilos. Maybe it's the food choices, or perhaps the colder mornings discouraging us from getting out of bed for that early morning run. Whatever the reason, supplementing with antioxidants can help with weight loss goals in time for summer.

A study from 2009 details how dietary carotenoids in middle-aged to elderly men helped reduce prevalence of Metabolic Syndrome symptoms. In particular, high total mixed carotenoid intake (including beta-carotene, alpha-carotene and lycopene) was associated with lower waist circumference as well as visceral and subcutaneous fat mass⁸. This study also found

Number of extra skin cancer cases related to UV radiation



that participants also had lower measures of serum triglyceride concentrations. This highlights the way in which the natural beta-carotene in *Dunaliella salina* is able to help normalise high LDL oxidation in non-insulin dependent diabetes (NIDDM) patients⁹.

Antioxidants seek out and neutralise reactive oxygen species (ROS) where they are excessive. They also help to boost liver function which helps account for their detoxification abilities¹⁰. *Dunaliella salina* is naturally high in antioxidant compounds due to its high content of natural mixed carotenoids, and so has a profound ability to detoxify heavy metals and other toxins. Carotenoids are important fat-soluble antioxidants and have an affinity with lipid-detoxification pathways, via the liver. By aiding in detoxification and supporting the liver, this algae helps to support healthy fat loss in many people.

Too much sunshine, drinking, smoking, partying and late nights?

The warmer and longer nights can be a great time to socialise. Many businesses will have their Christmas parties, and this time of year there are often family events, New Year's parties and endless BBQ's in the sun. Sounds great! But after a while, the drinking, smoking, rich foods and late nights and general partying can certainly take their toll.

At this time, it would be good to recommend not only specific liver supplementation to help support and detoxify, but also a wholefood antioxidant which can be taken on a daily basis.

Fortunately, *Dunaliella salina* is both a liver support supplement as well as a whole food antioxidant. *Dunaliella salina* as an easily-digested, natural multi-nutrient supplement also helps to replace trace electrolyte minerals and essential fats which may be lost from too many party days/nights.

Energy can also be an issue for many clients (and practitioners). The macro and micro nutrients in *Dunaliella salina* are required by our body for energy production and cellular repair. As an example, this algae contains a high level of magnesium, which is important for energy production, nerve and muscle function and healthy cellular metabolism¹¹.

For more information about *Dunaliella salina* in health care applications, please refer to our monograph; available online via practitioner login, or email us for a copy.

Part Seven of HTMA and the Lesser Known Trace Minerals

Vanadium

23

V

Vanadium
50.9415

Chemical Structure

Vanadium is a rare, soft, ductile grey-white transitional mineral. It is classified as a trace mineral element. Vanadium is often combined with certain minerals and used mainly to produce alloy metals. It is harder than most metals and steels and resists corrosion by alkalis, hydrochloric acid, sulfuric acid, and salt water

due to a protective film of oxide on the surface.¹ The biological importance of vanadium, however, is largely unknown. A natural part of the regulatory system, it is believed to prevent cholesterol formation both in blood vessels and in the central nervous system and may assist to regulate blood sugar balance.²

Sources

Environment

Vanadium is only found bound in chemically combined form in nature and occurs in carbon containing deposits such as crude oil, coal, oil shale and tar sands. This element occurs naturally in about 65 different minerals and in fossil fuel deposits. Vanadium is abundant in most soils in variable amounts and it is taken up by plants at levels that reflect its availability. In biology, a vanadium atom is an essential component of some enzymes, particularly the vanadium nitrogenase used by some nitrogen-fixing microorganisms.³

Diet

The uptake of vanadium by humans mainly takes place through foodstuffs, such as buckwheat, soya beans, olive oil, sunflower oil, apples and eggs. Other food sources may include; whole grain breads and cereals, vegetable oils, nuts, root vegetables, parsley, fish, radishes, dill, lettuce and strawberries. The vanadium content of food depends on the soil in which it is grown. There is no Recommended Daily Intake (RDI) for vanadium, however, a daily intake of 10 to 100mcg is considered to be safe.⁴ Processed or refined foods may contain higher levels of vanadium than unprocessed foods, possibly because of contamination from stainless steel processing equipment.⁵

Absorption and Excretion

The average adult body contains about 100mcg of vanadium and it is found mainly in the blood, and stored in fat, organ tissues and bones.⁶ Vanadium absorption from food may be as low as 5 to 10 per cent with most being eliminated in the faeces. Vitamin C, chromium, iron, protein, chloride and aluminium may have an antagonistic effect and may reduce vanadium absorption.⁷ Vanadium exists in several forms, including vanadyl sulfate and vanadate, with vanadyl sulfate most commonly found in nutritional supplements.

Functions and Applications

In humans, vanadium may act as a co-factor for enzymes involved in blood sugar metabolism, lipid and cholesterol metabolism, bone and tooth development, fertility, thyroid function, hormone production and neurotransmitter metabolism.⁸

In commercial industry, most of the vanadium (about 80%) produced is used as ferrovanadium or as a steel additive. Mixed with aluminium in titanium alloys is used in jet engines and high speed air-frames, and steel alloys are used in axles, crankshafts, gears and other critical components. Vanadium alloys are also used in nuclear reactors.

Toxicity and Excess

Large amounts of vanadium ions are found in a few organisms, possibly as a toxin. The oxide and some other salts of vanadium have moderate toxicity.⁹ Vanadium can have a number of effects on human health, when the uptake is too high. When vanadium inhalation occurs through air it can cause bronchitis and pneumonia with acute effects such as irritation of lungs, throat, eyes and nasal cavities.¹⁰

There are no known effects of vanadium deficiency. An excess of vanadium is known to inhibit cholesterol formation as well some amino acids, or proteins.¹¹ Decreased hormone production and selective protein deficiency could occur with excessive accumulation of this element.¹² Vanadium antagonises the mineral chromium and sulphur amino acids and could lead to blood sugar disturbances.¹³ Although excess vanadium is known to inhibit the cholesterol synthetase enzyme, no benefit was found in lowering lipid levels in people suffering from hypercholesterolemia or ischemic heart disease.¹⁴ Vanadium is also antagonistic to vitamin C and haemoglobin synthesis.¹⁵

Vanadium toxicity produces symptoms similar to respiratory tract infections. It is also suspected to be a neurotoxin through increased free radical production of lipid peroxidation.¹⁶ Signs and symptoms of vanadium overexposure include; conjunctivitis, naso-pharyngitis, cough, laboured breathing, rapid heartbeat (tachycardia), lung changes, chronic bronchitis, skin pallor, greenish-black tongue and an allergic skin rash.¹⁷

Analysis in HTMA

Vanadium is analysed and measured in HTMA as an additional mineral element. In HTMA, low levels below 0.002 ppm, may not be of any clinical significance. The presence of elevated levels above 0.014 ppm may correlate with previous exposure from an external or environmental source. This may be of some clinical significance due to its antagonistic effect with other minerals including; manganese, chromium, chloride and iron.

All references available at: www.interclinical.com.au/newsletter.php

A Great Summer Recommendation!

Australia's nutrient rich super food supporting overall health and vitality!

Algotene® Red Marine Phytoplankton

Be vitalised, support healthy ageing and fight against oxidative stress in the body.

Algotene® is made from a special **Australian red marine phytoplankton**, called *Dunaliella salina*. *Dunaliella salina* is one of nature's most nutrient dense plants, yet is only a single celled organism. It contains a large array of nutrients, including vitamins, minerals, amino acids (protein) and essential fatty acids (EFA's).



Taken daily, Algotene delivers high levels of nutrients and antioxidants which support:

- Healthy eyes
- UV protection
- Vitality
- Healthy ageing
- Beautiful looking healthy skin
- Healthy immune system
- Natural detoxification processes

CERTIFIED ORGANICALLY GROWN

NATURAL MULTI-NUTRIENT SUPPLEMENT

Available from selected health clinics, health food shops and pharmacies.

Always read the label. Use only as directed.



Each capsule contains: *Dunaliella salina*, whole plant dried 500mg marine phytoplankton.

TRACE NURIENTS™ Digestive Aids

Evidence based nutrients for therapy



HCL Plus

To help maintain normal **gastric** activity

Contains a special combination of nutrients and herbs to help support and normalise gastric hydrochloric acid production.

Digestive-Zyme

To help maintain normal **pancreatic** activity

Carefully selected herbs and nutrients working synergistically to help support and normalise secretion of pancreatic digestive enzymes.

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