RESEARCH
CELT NATURALS **REVIEW**

Antioxidants, Sterols and Inflammation, a Natural Approach.

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Introduction:

Allergies, cardiovascular diseases, fibromyalgia, eczema, asthma and some of the other auto immune conditions are all diseases involving inflammation, and are frequently treated with pharmaceuticals.

This paper outlines the potential for the use of natural supplements to combat some of these modern day conditions.

Antioxidants, Sterols and Inflammation, a Natural Approach.

1. ANTIOXIDANTS

WHY "ANTI" OXIDANT

Most of you will have heard of antioxidants, but how many of you have wondered why it is necessary to have "anti"oxidants, when oxygen is essential to life?

The answer lies in the atomic structure of oxygen. As most of you know an atom consists of a nucleus and a series of outside rings, or shells, containing electrons. These rings are particularly stable when they contain specific numbers of electrons, 2, 8, 18, 32 to be precise. Oxygen only has 6 electrons in its outside ring, when it really needs 8 for stability.

So what does it do? It grabs two extra electrons from where ever it can. This leaves an atom or molecule one or two electrons short – it becomes a "free radical"; then it goes on the hunt to steal electrons from another atom or molecule, and so the process goes on and becomes a chain reaction – creating more "free radicals" in the process.

SOURCE and EFFECTS of FREE RADICALS

These free radicals can also be produced by the body's own metabolic process; sometimes the immune system creates them to neutralize viruses and bacteria. However they can also be spawned by environmental factors such as pollution of various sorts, and particularly radiation. If you think you are safe from radiation in this concrete building, then just check your cell, phone! You are also being bombarded by X-rays from your computer.

The problems with free radicals is that they can damage cell membranes through the oxidation of unsaturated fatty acids, and can also be perceived as toxins by the immune system, which can lead to shift towards a Th-2 allergic type response, and all the consequences of an overactive immune system. (1 ,2, 3,)

OXIDATIVE STRESS and INFLAMMATION

What is not so well known is that oxidative stress can trigger the production of Il-6, a pro-inflammatory cytokine (4). Among the factors that normally down regulate this cytokine are estrogen and testosterone, which decline after menopause.
Not surprisingly levels of Il-6 have been found to be elevated in older populations. This age associated rise of Il-6 has been linked to lymphoproliferative disorders, multiple myeloma, osteoporosis and Alzheimer's disease (5).
Epidemiological studies by the National Institute on Aging have linked elevated Il-6 levels with a high risk of death from cardiovascular disease, and with a high risk of mortality in a population based sample of "healthy" older persons. (6, 7) Elevated levels of Il-6 have also been linked to disability onset in older persons, possibly due to

a direct effect of Il-6 on muscle atrophy, and/or to the pathophysiologic role played by Il-6 in specific diseases. (8, 9).

The bottom line to all this, and one of the major points that I want to make today, is that Il-6 can play a very important role in disease progression, particularly in members of the older population.

PAIN and INFLAMMATION

Well, pain is often linked to inflammation; inflammation is linked to Il-6; Il-6 is linked to oxidative stress (4), so is it possible to alleviate pain through reduction in oxidative stress? – most of you were probably ahead of me at this point!!

Interestingly, in Pubmed there is documented research of cases of pain reduction through the use of antioxidant therapy. These cases involve chronic pancreatitis, prostatitis, asthma, and diabetic neuropathy, - all these involve inflammation and Il-6. (10, 11, 12, 13, 14,).

We are going to come back to Il-6 again later, but first, let's take a look at:

2. STEROLS.

WHAT ARE THEY, WHERE DO THEY COME FROM

Plant sterols are often referred to as "plant fats", when in fact chemically they are steroidal alcohols – I guess "steroidal alcohols" does not look too good on the label of a natural health supplement! The name sounds intimidating but if I tell you that they belong to the same chemical class as cholesterol and vitamin D they may sound a little more familiar. They are found in the membranes of most vegetables, fruit and nuts.

They are essential to the body, but like vitamin C, the body cannot synthesize them, they have to be ingested. There are number of sterols in the phytosterol family. The most commonly known are beta-sitosterol, campasterol, brassica-sterol, stigmasterol, and so on. The most important of this class is beta-sitosterol.

For many years, when our diet was mainly plants and vegetables, they were a natural part of our diet. However due to the modern processing of food modern diets tend to be deficient in sterols. Furthermore the absorption of the sterols that we do get in our diet is inhibited by the fact that our modern diets generally contain cholesterol, which inhibits the absorption of beta-sitosterol. The dramatic increase in autoimmune and immune related diseases maybe partly related to the absence of plant sterols in our modern diet, as these nutrients help to maintain a balanced immune system.

The main commercial sources of beta-sitosterol are soy (41), sugar cane, canola, and "the pristine forests". Allusion to the "pristine forests" has great marketing potential, but this source is actually the effluent from pulp mills, - not a source that I would choose for my family! (48). So in looking at sterols for therapeutic use I would be looking at beta-sitosterol from soy, sugar cane or canola.

The molecular structure of sterols, and particularly beta-sitosterol, is similar to that of other organic compounds produced by the body, in particular cholesterol, vitamin D, and testosterone to name a few – only the side chain varies.

ESTERS and STANOLS

You may also hear the terms “esters” and “stanols” associated with sterols. Sterol esters are products of sterols and organic acids, where the organic radical replaces the hydroxyl group.
Stanols are hydrogenated sterols, and not familiar to the body. Like hydrogenated oils, we do not know the long term effects

STEROLS in NUTRITION

Sterols are probably best known for their immune modulating properties.
The body’s response to environmental toxins and radiation is a shift to the Th-2 activity, with a consequent loss in Th-1 activity. Sterols can help to modulate this response (19). This Th-1/Th-2 balance is critical in the development of allergies, eczema and a series of other autoimmune conditions (20).

Sterols are also reasonably well known for their ability to block the absorption of dietary cholesterol. It is important here to be using “free sterols”, as opposed to esters whose effectiveness declines over a couple of months (18).

Stanols which are hydrogenated sterols can also block the absorption of cholesterol. However they are not familiar to the body and we do not know their long term effects. Perhaps more importantly they also block the absorption of all sterols, including the beta-sitosterol that is essential to the body.

The advantage of sterols over statins is that while statins block cholesterol production from the liver, (and also inhibit the production of CoQ 10), the sterols inhibit the absorption of the dietary cholesterol and leave the liver to control the body’s cholesterol levels naturally (21)

Sterols can also be very helpful to older men suffering from BPH, (22). Not only is this problem a social inconvenience, frequent night time visits to the bath room can result in sleep deprivation, which in turn can have an adverse impact on the immune system, and also result in fatigue and depression.

STEROLS and INFLAMMATION

Some exciting research is now showing that beta-sitosterol can inhibit the production of the Il-6 that we talked about previously as being a pro-inflammatory cytokine produced by oxidative stress.(23, 24).

You may recall that epidemiological studies by the National Institute on Ageing have linked elevated levels of IL-6 with increased risk of death from cardiovascular disease (6,7).

Il-6 has also been linked with disease progression in the older population in a number of diseases, rheumatoid arthritis, multiple myeloma, osteoporosis, Alzheimer's, CVD and mortality in general. (5, 6, 7, 8, 9, 25, 26, 27).

So Il-6 is certainly a cytokine whose production you would want to minimize.

In addition to minimizing Il-6, Sterols can also stimulate production of an anti-inflammatory cytokine Il-10 (23).

Il-10 has been associated with inhibition of inflammation (23, 28, 29, 30), and what is perhaps particularly important, the inhibition of atherosclerotic lesions and blocking atherosclerotic events (31, 32).

Il-10 has been referred to as an "Immunologic Scalpel" for atherosclerosis, and is under investigation, and in a few cases is at the stage of clinical trials, for therapy for a variety of chronic diseases. These include rheumatoid arthritis, inflammatory bowel disease, psoriasis, and multiple sclerosis (33, 42).

So, what are the potential applications of**:**

3. COMBINED ANTIOXIDANT / STEROL THERAPY

Probably two of the most prevalent conditions confronting those involved in health care are allergies and fibromyalgia. They both involve oxidative stress and inflammation (43, 44, 45, 46).

ALLERGIES

A double blind, randomized, placebo controlled trial at the University of Guelph (24) has shown that a patented combination of antioxidants and sterols containing beta-sitosterol, (Immuno300), can reduce Il-6 by an average of 35%, and the basophils that release the histamine by an average of 25%. Not surprisingly this antioxidant/ sterol combination has been found in many cases to be effective in alleviating seasonal allergies.

FIBROMYALGIA

Research by Bagis, Tamer at the University Medical School at Mersin in Turkey (34), and by Fulle, Mecocci at the University of Perugia in Italy (35), found associations between oxidative stress and fibromyalgia, and between oxidative stress and chronic fatigue.

As in many cases fibromyalgia also involves pain and inflammation, it is not surprisingly we are hearing of more and more cases where the symptoms of fibromyalgia and chronic fatigue are being alleviated with a combination of antioxidants and sterols.

Another area of major concern in the healthcare field is the cardiovascular system..

CHOLESTEROL / CARDIOVASCULAR SUPPORT

It is well known that “free sterols” can inhibit the absorption of cholesterol. It is important here to focus on the “free sterols” as opposed to sterol esters which only work for a limited time (18), or stanols that not only inhibit cholesterol absorption, they also inhibit the absorption of the beta-sitosterol that the body needs and cannot make for itself. So it is important to be looking at “free sterols” for cholesterol reduction.

Not only can “free sterols” inhibit the absorption of cholesterol, they can also reduce the levels of the inflammatory cytokine Il-6, which has been associated with CVD and hypertension (26, 27.).

Il-6 can also be inhibited by antioxidants, as it is triggered by oxidative stress (4).

A randomized double blind placebo controlled trial of a patented antioxidant/sterol mixture, (Immuno300), at the University of Guelph showed an average reduction in LDL of 15%, and an average increase of HDL of 9%. It also showed an average reduction in Il-6 of 35%.

When you couple this with substantial increases in Il-10 (23), with it’s association with the prevention of atherosclerotic events (29, 30, 31, 32, 33), you realize that this natural way of providing cardiac support can have many advantages over statins, not least is the fact that you do not interfere with the function of the liver and it’s production of CoQ-10. As a bonus it may also reduce C-reactive protein (47).

BPH

I think that we have already mentioned the use of this combination for BPH (22). I can assure you from personal experience that it is far and away the most effective product on the market for reducing urinary retention, and consequently night time visits to the bathroom that can be a major interruption to a good night’s sleep.

The antioxidant component can also help to prevent the development of prostatitis (12). Urologists in Germany have been using plant sterols to treat enlarged prostates for over twenty years. As side effects, you will also find that your patients will have lower cholesterol levels, and get fewer flu’s and colds!

Generally speaking physicians have found that this antioxidant/sterol combination can be very helpful in alleviating the symptoms of many autoimmune disease such as eczema, psoriasis, rheumatoid arthritis, asthma, etc (42).

4. WHY IMMUNO300 ?

There are several reasons for using Immuno300.

First, it is very important to reduce the oxidative stress within the body. Immuno300 contains Enzogenol, a very powerful broad spectrum antioxidant derived from the bark of selected pine trees, which contains over 2,000 different flavonoids - probably the most comprehensive complex of natural antioxidants yet discovered.

The patented extraction process, developed by the University of Canterbury in New Zealand, uses only pure water, which ensures that significant groups of antioxidants are harvested, and not lost as in the conventional solvent based process. There are also no problems arising from solvent residues.

Secondly, in order to inhibit Il-6 and promote Il-10, Immuno300 incorporates “free sterols” derived from soy. That is sterols free of the esters, whose effects can be attenuated over time (18), and also free from stanols which are the hydrogenated sterols that block the absorption of all sterols, including the beta-sitosterol.

Thirdly is the inclusion of a proprietary blend of amino acids, enzymes and peptides designed to facilitate the absorption and retention of the sterols and antioxidants. As far as I know no other manufacture of sterol products has paid attention to the issue of absorption and retention of the sterols. And this is important as sterols normally are difficult to absorb and only stay in the body for a short period of time.

Fourthly, I am sure that some of you are waiting to ask me if sterols are actually steroidal alcohols, then what happens to them when they hit stomach acid ?

That is a very good question, and the question is equally relevant to the antioxidants, as they also have hydroxyl groups in their molecular structure. The answer is that they would turn into sterol esters, which you may remember only work for a limited period of time.

So, how do we prevent that? Well, as far as I know, Immuno300 is the only product containing encapsulated sterols that is enteric coated, so that the capsules pass through the stomach acids and dissolve in the alkaline environment of the small intestine. This ensures that the sterols and antioxidants pass through the stomach without being destroyed, and also facilitates the absorption and retention of both the sterols and the antioxidants.

This is really a technical achievement. As far as I know, we are the only company that enteric coats two piece vegetable capsules containing sterols to ensure the absorption, probably because it is a very difficult process with a large wastage. The spraying process is a very difficult, too much and the whole batch turns into a soggy mass, too little and the enteric coating is not effective. The drying process is again critical, too slow and the capsules dissolve and you are left with a soggy mess again, too fast and the capsules crack during the bottling process. There can be a very large wastage if you do not get it just right.

5. THE LAST WORD

As a final word, one of the things that really amazed me when I first started this journey into the natural health field was when I discovered that people with multiple personalities showed different symptoms in different personalities.

There is a classic case mentioned by Depak Chopra in his book “Quantum Healing” where this man is diabetic in one personality, but when he changes personality his blood sugars return to normal. In another personality he is allergic to orange juice and will burst out in hives. But when he changes personality all the hives disappear.

Another case was a patient of Bernie Siegel, who had to sleep with three pairs of glasses by her bedside, as she was never quite sure which personality she would wake up in.

This tells me the power of the mind – and if you do not believe me, just think about the placebo effect!! The power of the mind is incredible powerful, and the biggest threat to our immune system comes from stress. There is no simple answer to this, but laughter, good friends, exercise and sleep can help. It is important to find time for relaxation and to find a sense of peace, to find your own path up the mountain, whether this is through music, running, ski-ing, or particular religious practices. The important thing is to climb the mountain. (49).

The issue should not be traditional or complimentary treatments, but trying to stack he odds in your favour by using all the resources available, traditional and complimentary, physical and spiritual, as you feel appropriate. It starts with you taking control.

For further information please call :

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(Immuno300 is a patented product of Celt Naturals, a subsidiary of Celt Corporation**).**

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Alan Fergusson and Jack Davidson are the founders of Celt Naturals and the Developers of Immuno300™.

Alan was educated at Durham University, England were he graduated with an honors degree in physics. With a background and keen interest in nuclear physics, Alan joined the Nuclear Power Division of a major engineering company. Subsequently he was responsible for Operations Research activities within major corporations in Africa and Canada. More recently Alan has focused on research in the area of natural supplements.

Alan enjoys the outdoors, and has spent many enjoyable hours hiking and camping in the mountains of Alberta. One of his passions is downhill skiing, and he was an active "ski host" at Nakiska, the site of the 1988 Olympics, for ten years. He believes that a strong immune system helps the body to combat many of the chronic diseases we see so much of today.

Jack was also educated in the U.K. and graduated with a degree in engineering from Imperial College, London. Since then he has worked with a number of major companies with interests in various parts of the world. His personal interests include athletics, cross country skiing and especially long distance running.

Jack has competed in many running events at an international level, including over 30 marathons. He has always had a keen interest in maintaining a healthy lifestyle. More recently he has specialized in the areas of health foods and supplements, with a special focus on the immune system.

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Please feel free to contact Bio Pathica Ltd on 01233 636678

"MAKING A DIFFERENCE"

Many new and innovative products evolve from personal needs, and Immuno300 is a very good example.

Immuno300 was developed as a natural support for the immune system. It is used by Alan and Jack and their families to support their immune systems, and to help to protect them from the serious diseases that seem to be gaining prevalence in to-days society

From the conception of Immuno300 we have had two primary aims:

To provide a product using the highest quality ingredients available,

And above all, to help to improve the quality of life for people experiencing debilitating diseases, for then we can truly say:

"we have made a difference".

Alan and Jack.

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