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Carnosine not only prevents the formation of the toxic AGE compounds, but is also an important protector of proteins. It protects against protein-protein, protein-lipid and protein-glucose cross-link formation, a process whereby proteins become stuck together and their function degraded. (The formation of such cross-links is deeply implicated in the development of cataract, hypertension and kidney failure in diabetic and other patients.)

Carnosine even has the ability to break damaging cross-links once they have formed. All this makes carnosine a very important anti-ageing nutrient indeed.

Where does carnosine come from? Unlike almost all the other micro- and phyto-nutrients we go on about, carnosine occurs exclusively in animal tissues; and specifically meat. As carnosine has so many anti-ageing effects, this has lead some to suggest that we should be more carnivorous – both green and black – has anti-cancer effects. This was recently reinforced by a joint American–South Korean study, led by the US Department of Agriculture, and published last month in the Journal of Agricultural and Food Chemistry (Friedman et al ’06). There is already a good deal of work that indicates that tea flavonoids, found in tea. Green tea contains 30 to 40 per cent of flavonoids, while black tea (green tea that has been oxidised by fermentation) contains between 3 and 10 per cent. But tea contains other good things too, including highly bioavailable polyphenols, and the unusual amino acid L-theanine.

The researchers looked at the effects of each of these in isolation, and then at the effects of a whole tea extract (which is what we drink) against a range of common cancer cell lines. These included breast, lung, prostate and colon cancer cell cultures; and in each case, the tea extracts killed large numbers of the cancer cells, with higher concentrations of tea killing larger numbers than weaker extracts.

“These findings extend related observations on the anti-carcinogenic potential ingredients of tea, and suggest that consumers may benefit more by drinking both green and black teas,” wrote lead author Friedman from the USDA. Other scientists have shown that the tea polyphenols can reduce the formation of certain carcinogens (d’Occhio et al ’06), but it is becoming abundantly clear that these valuable compounds can directly arrest and kill many cancer cells, and force others to redifferentiate; an important process that effectively renders them harmless.

These and other studies have led key researchers at the University of Leicester to recommend large-scale clinical trials of the tea flavonoids in the prevention of prostate and cervical cancers (Thomasset et al ’97). Given that tea is pretty safe – especially when compared to the highly toxic anti-cancer drugs currently used – I wholeheartedly agree with them. I would also point out that most soft drinks have little or no polyphenols, and many contain none of the anti-cancer compounds outlined above.

**Tea and Cancer**

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Vitamin D and Auto-Immune Disease

A new paper indicates that staying out of the sun may seriously damage your health. A fascinating article in the Journal of the American Medical Association reports on a survey of white US military personnel, in which higher levels of vitamin D were clearly and consistently linked to reduced risk of developing multiple sclerosis (Munger et al ‘06). The link was particularly strong in younger subjects, and those with the highest vitamin D levels were 62% less likely to develop MS than their colleagues with the lowest vitamin D levels.

The researchers were so struck by the apparently protective effects of vitamin D that they suggested that increasing the vitamin D levels in adolescents and young adults, for example by supplementation, could result in an important reduction in MS.

This is not only a personal but also a public health issue. MS is one of the most common neurological diseases in young adults, affecting some 2 million of them worldwide. And at the time of writing, the pharmaceutical establishment offers no cures for this debilitating and tragic illness; the drugs currently given to MS patients are not only ineffective but also highly toxic.

How very obtuse of us not to have noticed the glaringly obvious and long-known relationship between sunlight exposure and the risk of MS; and how stupid of us not to have moved on from this simple observation to recommending daily outdoor exercise – or, for those living in Northern Europe, vitamin D supplements. Sadly, children today are more likely to be exposed to sunlight than their parents did, and the medical profession have little faith in, or understanding of, vitamin D.

For example, Munger and her colleagues called for a new study among first-degree relatives of individuals with MS, said to be at higher risk of developing MS, to further investigate the potentially protective role of vitamin D. But at the same time, they concluded that it was still too early to use vitamin D supplements to prevent MS. This seems to me to be wildly over-cautious, given that vitamin D supplements are, unlike the MS drugs, cheap, safe – and increasingly, in circles where they are used, regarded as effective (Gille ‘06, Strand ‘06).

For the more sceptical among you, vitamin D supplements have already been shown to protect against MS in a mouse model (Nataf ‘96); and for the more scientifically-inclined, the mode of action has also been pieced together. Vitamin D is essential for the normal functioning of the immune system. When levels of D are too low, auto-reactive T-cells are formed – exactly those cells which cause the damage in MS. When levels of D are normalised, the balance of T cells is restored and autoimmunity is avoided (Hayes et al ‘97, Cantorna ‘06).


Strand R: personal communication, 2006

Vitamin K - what is it good for?

It has long been said that patients taking the blood thinning drug warfarin should not take vitamin K supplements, as these could, theoretically, neutralise the effects of the drug and thereby increase the risk of blood clots. Now, however, a fascinating study by researchers at the University of Rochester School of Medicine has shown that this is not the case. It was already known that a low intake of vitamin K was linked to unstable control of anti-coagulation, so this research, carried out at the University of Rochester, didn’t exactly come out of the blue. But what was surprising was how effective the vitamin K supplements were. They helped to stabilise clotting in over half of all the cases studied.

When different kinds of bacteria find themselves in the same environment, they may ignore each other, or support each other; but in many cases they will fight each other, competing for the same resources or living with the winner in a micro-Darwinian situation, and here – as in the larger world – the strongest survive.

There is good evidence that taking probiotic bacteria can help to build up a healthy digestive tract by suppressing the growth of ‘bad bacteria’, and now there is evidence that as far as probiotics are concerned, the digestive tract starts just around the corner.

Two studies have just been completed at the University of Florida in which probiotic bacteria were given in oral formulations to healthy young adults. In both cases there was a dramatic fall in the number of strains of bacteria which are common drug-resistant pathogens, caused by the use of antibiotics. Numbers of Campylobacter rectus, Porphyromonas gingivalis and Streptococcus mutans fell very significantly; in the case of Streptococcus mutans, levels of the bacteria were reduced to less than 1% of the pre-treatment values (1).

How do the probiotic bacteria achieve this victory over the disease-causing bacteria? They have a number of tricks up their tiny sleeves. For example, they stick fast to the teeth and gums, displacing pathogens from their docking sites (Haukioja et al ‘06). And they produce bacteriocins, peptide molecules which act as powerful antibiotics and kill off their bacterial rivals, but which have no effects on mammalian cells.

The company that sponsored the Florida research, Organics, is hoping to sell us probiotic toothpaste and other probiotic food supplements, as alternatives. You could, for example, eat live yoghurt, which – providing it contains the right probiotic bacteria – also reduces the numbers of pathogens, including those that cause dental decay (Capgras et al ‘05). This is not what you wanted to be really smart, you could put probiotic-derived bacteriocins into the toothpaste, the chewing gum and indeed any foods at all (O’Connor et al ‘06). Why might this be so? Because the bacteriocins are only effective when alive, whereas the bacteriocins are effective indefinitely.

Watch this space; the next generation of toothpastes are just around the corner.
Fish Oil - New benefits

A new study reports that fish oils can suppress the eorumation of adipocytes (fat cells), and may thus lead to reductions in body fat. Not what we have come to expect from an oil (eating oils or fats makes us fat, is the common wisdom, because they are so calorie-rich); but the omega-3 fatty acid in question, DHA, is not ordinary oil.

The research team, based at the University of Georgia, added DHA to cell cultures of human pre-adipocytes (cells that grow into adipocytes), at the same concentrations that occur in human plasma after a fish oil supplement. They found that DHA killed off significant numbers of the cells by triggering apoptosis (programmed cell suicide); reduced the accumulation of fat in those cells that survived; and promoted lipolysis, which is the breakdown of fat deposits. This combination of effects, the researchers said, would be expected to lead to weight loss; and indeed, previous studies had shown that fish oils fed to rodents do exactly this.

Verdict: very interesting. I would not rely on a fish-rich diet to make everyone slim, but this adds to all the other evidence that incorporating oily fish in the diet is good for your general health. The problem, however, is that fish stocks are running low, and there isn’t enough for everyone.

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It was already known that a low intake of vitamin K was linked to unstable control of anti-coagulation, so this research, carried out at the University of Newcastle, didn’t exactly come out of the blue. But what was surprising was how effective the vitamin K supplements were. They helped to stabilise clotting in over half of the cases studied.

As warfarin use is unpleasant and associated with a high risk of adverse effects (including potentially lethal haemorrhaging), anything that can help to make its effects more predictable, and perhaps cut down on the doses used, is a real breakthrough. Vitamin K supplements should also help to reduce the number of patient visits to hospital for monitoring, and that will be a blessing to many as well.

There are various forms of vitamin K available, but the available data suggest that the most effective is MK-7, a form of vitamin K extracted from fermented soybeans (natto), and sold in Norway and the USA as NattoK2. It is only available on the web at this time. This is due to the bone-headed new government policy is needed for sunlight exposure in order to make enough vitamin D.

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Review.

Strand R: personal communication, 2006


Probiotic Toothpaste?

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1 Commercial data, not yet published


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Protection from Garlic and Onions

A large scale epidemiological study on over 25,000 Italian and Swiss people has indicated that a high intake of garlic and onions was associated with significantly reduced risks of a wide-range of cancers. Almost 10,000 people with colorectal, ovarian, prostate, breast, renal, and palate cancer, respectively, were divided into four groups ranging from non-users to people who consumed one portion per day, with a portion defined as 80 grams of onion.

The researchers report that both onion and garlic were associated with significant reductions in the risk of all the cancers studied, with garlic in particular linked to a large risk reduction. Indeed, people with a 'high' of garlic had an associated risk reduction of 84% for cancer of the oral cavity and pharynx, 88% for oesophageal cancer, 56% for colorectal cancer, 83% for laryngeal cancer, 25% for breast cancer, 73% for ovarian cancer, 71% for prostate cancer, and 38% for renal cell cancer, compared to people with the lowest garlic intake.

People with in the highest intake group for onion (one or more servings per day) had an associated risk reduction of 36% for cancer of the oral cavity and pharynx, 57% for oesophageal cancer, 26% for colorectal cancer, 44% for laryngeal cancer, 10% for breast cancer, 22% for ovarian cancer, 19% for prostate cancer, and 31% for renal cell cancer, compared to people who did not eat onions at all. Recently also, the European Prospective Investigation into Cancer and Nutrition (EPIC), following 521,457 subjects in 10 European countries, reported that a diet rich in garlic and onions could protect against stomach cancer. An increase in the intake of onions and garlic of 10 grams per day (half an onion) was associated with a 30% reduction in the risk of intestinal gastric cancer.

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Carnosine not only prevents the formation of the toxic AGE compounds, but is also an important protector of proteins. It protects against protein oxidation, glycation and cross-link formation, a process whereby proteins become stuck together and their function degraded. (The formation of such cross-links is deeply implicated in the development of cataract, hypertension and kidney failure in diabetic and other patients.)

Carnosine even has the ability to break damaging cross- links once they have formed. All this makes carnosine a very important anti-ageing nutrient indeed.

But where does carnosine come from? Unlike almost all the other micro- and phyto-nutrients we go on about, carnosine occurs exclusively in animal tissues; and specifically meat. As carnosine has so many anti-ageing effects, this has lead some to suggest that we should be more carnivorous (Hipkiss ‘06); a dietary shift which undoubtedly reduce the excessive glymic load of the carb-rich diet that so many of us eat today. In terms of the Sunday lunch, this means more turkey, and fewer potatoes.

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