

## Selenium and cancer

### A Mineral to prevent cancer?

The American FDA published an announcement on its web site in early 2009 stating that 'Selenium may reduce the risk of certain cancers' adding that 'Some scientific evidence suggests consumption of selenium may reduce the risk of certain cancers'.

This is indeed a breakthrough for this natural mineral. The conservative FDA supporting a natural compound for cancer prevention?

With some just cause: Also in early 2009 German scientists from St. Josef's Hospital in Wiesbaden presented their findings on selenium, concluding that selenium blood levels were significantly lower in men with benign prostate hypertrophy or prostate cancer. (*Acta Oncologica*)

In another study (*Molecular Nutrition and Food Research, 2009*) experts suggest selenoproteins have powerful antioxidative and anti-inflammatory effects that could make them important in preventing prostate and colorectal cancers.

Then in the March 2009 edition of *Clinical Cancer Research* researchers from Penn State College of Medicine showed that isothiocyanates found in cruciferous vegetables (like cabbage, cauliflower and kale) when combined with selenium supplementation became even more potent in treating melanoma.

'Selenium deficiency is common in cancer patients, including those diagnosed with metastatic cancer', said lead researcher Professor Gavin Robertson.

Importantly in the prostate cancer studies, as in the melanoma research, a protein Akt3, driven by oestrogen, develops. There are no drugs to stop it, and Akt3 causes the cancer to develop, according to Robertson. 'Selenium is known to destabilise Akt3', he adds.

This means that selenium doesn't just help prevent cancers, it possesses the ability to fight them too.

### The background

Selenium is a mineral we are only just learning about. It was not even discovered as an essential nutrient until 1979 and only in 1990 was an RDA recommended. It is now known to work with vitamin E and Glutathione Peroxidase to help protect the body's tissues from free radical damage. Selenium and vitamin E seem to have a 'magnifying effect on each other. Selenium also appears to be anti-viral and anti-bacterial in its actions.

Selenium has two other effects that may well play a role against cancer. Firstly, it protects the body against the increasing problem of toxic metals, e.g. mercury, cadmium and arsenic. This is particularly relevant in the case of mercury, which pollutes our bodies via local coastal fish, fillings in our teeth and vaccines. The FDA in the USA in 2001 identified that 83 of the 100 most common vaccines used mercury as the carrier - by asking nicely they have reduced this to 73!!

Secondly, selenium levels affect your hormones - in particular, the thyroid hormone, from which it removes the iodine. This has a knock-on effect to all of your hormones.

Various studies have looked at the blood selenium levels of people from different parts of the globe and the conclusion is invariably that low levels are linked to higher cancer rates.

In 1984 researchers at the University of Kuopio in Finland looked at 8,000 women and men who were interviewed and blood samples stored. In the following years 128 men developed cancer. When their blood was compared to those without cancer it was found to be deficient in selenium - in fact those with the lowest levels were three times more likely to develop cancer. This was especially true for cancers of the blood and colon.

A second study by universities all over the USA looked at 11,000 people across 5 years. 111 of the participants developed cancer and again their selenium levels were much lower than healthy people tested. In this research the cancers most noted were again those of the gastrointestinal tract, but also prostate cancer. By contrast

selenium does not appear to influence breast cancer rates - the Harvard Medical School study on 62,000 nurses was inconclusive.

Males appear to have a slightly greater selenium requirement. It is lost in the semen and concentrates in the testes and seminal ducts.

One of the most important cancer trials was undertaken by the Nutritional Prevention of Cancer Study Group, (Effects of Selenium Supplementation for Cancer Prevention in Patients with Carcinoma of the Skin, Larry Clark *et al* - JAMA, 1996) and utilised a 0.5gm high-selenium brewers yeast tablet providing 200 mcg of selenium per day. 1312 patients participated. This study showed that there was no effect on skin cancers in the group taking selenium, but a 52 per cent reduction in total cancer mortality, a 17 per cent reduction in all cause mortality, a 37 per cent reduction in total cancer incidence, a 46 per cent reduction in lung cancer incidence, a 58 per cent reduction in colon cancer incidence and a 63 per cent reduction in prostate cancer incidence. And this is in a group of patients in the United States where selenium intake from the diet is approximately 2-3 times higher than that in the UK and Europe in general.

Much work has also been done with the population of China where there are both selenium rich areas and selenium deficient areas. Research there suggests that selenium has a 20 per cent positive effect on cancer risk.

In the USA 1993 China study, the group taking vitamin E, beta-carotene and selenium showed more than 30 per cent less cancers. In the French seven year SUVi Max study with 17,000 participants the male group taking vitamins C, E and beta-carotene, plus zinc and selenium reported 37 per cent less deaths from cancer.

Currently Dr. Margaret Rayman, from Surrey University, a world expert in selenium is involved in the Precise study. Given a 5 star rating by the Medical Research Council, this is a major European trial (involving 35,000 participants Europe-wide) investigating the effect of supplementation on cancer at different doses. Funding is an issue at £2 million but hopefully will be sorted out one day.

### Recommended Daily Levels And Supplementation

The official RDA is around 55 micrograms. It is felt that levels around 200 micrograms are probably beneficial but above that there is concern. At 900 micrograms there is proven toxicity, which manifests itself in dermatitis, hair loss and diseased nails.

Selenium yeast is the form of selenium used in the recent and most encouraging cancer trials, although usually this is not a live yeast. Someone who has a massive yeast overgrowth problem might need to stay away from yeast for a while, but this should not affect everyone.

Selenium yeast provides selenium compounds similar to those found in cereals, so closely resembles a food, which is ideal for a food supplementation (approx. 50% of the selenium compounds found in yeast comprise of selenomethionine). Seleno-methionine is another organic form and, whilst inorganic forms such as selenite and selenate are not naturally found in foods, they have been found to produce higher levels of glutathione peroxidase quicker. This is only one selenium dependant enzyme in the body and there are 35 or more selenoproteins that have been identified to date which all rely on selenium for their function. Bioavailability studies have shown that the inorganic forms of selenium are less bioavailable than organic forms.

### Eating The Vitamins

Try Brazil nuts, wholemeal bread, sunflower and pumpkin seeds, free-range eggs, skinless chicken breast, tuna fish, onions, wheat germ, tomatoes and broccoli. There is even a selenium-enriched form of garlic, which is giving strong anti-cancer results. ☺

Alternatively you can supplement: [click here](#) to review the Natural Selection 'Product of Choice'.



At last - the definitive, research-based book on how to build a diet to help beat cancer. [Click here](#) to read about it. ☺ Source Chris Woollams Newsletter – 27 February 2010