More support omega-3 may protect against colorectal cancer

22/11/2006 **– A diet rich in omega-3 polyunsaturated fatty acids (PUFAs) could reduce the risk of colorectal cancer by 85 per cent, suggests a new study from Japan.**

But high consumption of saturated fatty acids (SFAs) could increase the risk by a whopping 700 per cent, said the researchers from the Aichi Cancer Center Hospital and Nagoya University Graduate School of Medicine, Nagoya.

"We could clearly show decreased and increased risks for colorectal cancer related to PUFAs and SFAs compositions in erythrocyte membranes, respectively," wrote lead author, Kiyonori Kuriki in the journal *Cancer Epidemiology, Biomarkers & Prevention* (Vol. 15, pp.1791–1798).

Omega-3 has been identified as one of the super-nutrients taking the food and supplements industry by storm. Much of its healthy reputation that is seeping into consumer consciousness is based largely on evidence that it can aid cognitive function and may help protect the heart against cardiovascular disease.

But one area in which the evidence is controversial is the fatty acid's role in reducing the risk of cancer.

The new research investigated the link between the fatty acid compositions of red blood cell membranes (erythrocytes) for 74 people with colorectal cancer (cases) and 221 healthy controls free from cancer. The controls were matched by age and sex.

Dietary intakes were assessed for fish, fat and fatty acid intake, and while no link between meat, fish, fat, and fatty acids in general was observed, the researchers do report a significant association between the docosahexaenoic acid concentration in the blood cell membranes and a reduced risk of the cancer (74 per cent reduction between the highest and lowest concentrations).

Similar beneficial associations were observed for arachidonic acid (AA) and PUFA concentrations, as measured by an accelerated solvent extraction and gas-liquid chromatography (GLC) – risk reduction of 68 and 85 per cent, respectively, between the highest and lowest concentrations.

Negative associations, indicating an increase in the risk of colorectal cancer, were observed for red blood cell membrane concentrations of SFA (720 per cent increase) and palmitic acid (546 per cent) and between the highest and lowest ratio of SFA/PUFA concentrations in the cell membrane (845 per cent).

The researchers did not study the underlying mechanism, but Kuriki and co-workers suggest that their results challenge with the theory that DHA inhibits the arachidonic acid (AA) cascade that has been linked to cancer formation and cell proliferation.

Metabolism of fatty acids produces compounds called prostaglandins, which can be either pro- or anti-inflammatory. The prostaglandins derived from omega-3 fatty acids are said to be anti-inflammatory and may protect against the development of cancer, while prostaglandins derived from omega-6 fatty acids, like AA, are proposed to be pro-inflammatory.

"Further research is needed to investigate the discrepancy between our findings and the generally accepted role of the AA cascade," said the researchers.

The potential protective benefits of omega-3 fatty acids against cancer was the subject of a review, published in January 2006 in the *Journal of the American Medical Association* (Vol. 295, pp. 403-415).

Researchers scrutinized 38 studies published between 1966 and October 2005 that investigated the purported link between omega-3 and different types of cancer and met certain criteria. The studies had to describe the effects of omega-3 fatty acid consumption on tumour incidence, be prospective cohort in design, and be conducted on a human population.

Despite finding 65 estimates of association across 20 different cohorts for 11 different types of cancer and six different ways of assessing omega-3 consumption, only eight of these were found to be statistically significant.

Three studies showed decreased risk of breast cancer with omega-3 consumption, one for colorectal cancer, one for lung cancer and one for prostate cancer. But for each type there were also significant associations for decreased risk, and more estimates that did not identify any association.

Indeed, commenting at the time, Josephine Querido, science information officer at Cancer Research UK, said: *"The jury is still out as to whether eating more omega-3 fatty acids will reduce your risk of developing cancer."*

A study published in the June issue of the *Journal of the National Cancer Institute* (Vol. 97, no 12) concluded from data from 1 million participants in the European Prospective Investigation into Cancer and Nutrition (EPIC) trial that people eating less than 14g of fish a day were 40 per cent more likely to develop colorectal cancer than those eating more than 50g per day.

However the researchers were unable to differentiate between fatty fish, which contains the majority of omega-3 fatty acids, and other fish.