

PRESS RELEASE

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TALKING CELLS MAY HELP PREVENT CANCER

Researchers at the University of Hawaii have found out exactly how pigments in yellow, red and green vegetables, known as dietary carotenoids, can prevent cancer. They reported today (Tuesday 20 July) that these carotenoids stop tumour growth by restoring communication between cells. By keeping cells 'talking' to each other, they may also prevent cancer from developing in the first place.

Speaking at BioScience2004 in Glasgow, Dr John Bertram showed that dietary carotenoids increased the activity of a molecule called connexin 43. This molecule forms small channels between cells and, by doing so, connects virtually all cells in the body. Through these channels, cells exchange nutrients and many vital signals that ensure normal cellular growth.

Most tumour cells have lost this ability to communicate and, as a result, have isolated themselves from their normal neighbours. Treatment of normal mouse cells with carotenoids prevented the formation of cancer by cancer-causing chemicals and increased communication in these cells. When Dr Bertram treated three different types of human tumours with carotenoids, communication between cells was restored and the tumour cells behaved more normally, both in culture and when grown in laboratory animals.

He found that another cancer preventive agent, retinoids (derived from vitamin A), could also increase connexin 43 activity, especially when combined with carotenoids. "This is a

new mechanism whereby tumour growth can be interrupted. Connexin 43 may be a potential new target for cancer treatment,” said Dr Bertram.

Maintaining efficient communication between cells may also be how carotenoids and retinoids stop cancer forming in the first place. “Prevention is always better than cure,” he continued. “And prevention of cancer should be a priority goal for health care professionals.” Studies have shown that up to 70% of human cancer is preventable and 40% of this can be attributed to diet. Carotenoids have been repeatedly identified as important components of a healthy diet. People who consume large amounts of carotenoid in their diet tend to have a lower risk of cancer and heart and eye diseases.

Although carotenoids are available as supplementary tablets, Dr Bertram recommends that people should get their carotenoids by eating carotenoid-rich fruits and vegetables. Carotenoids typically do not dissolve well in water and are not readily absorbed by the body. In collaboration with Hawaii Biotech Inc., Dr Bertram has developed new versions of carotenoids that are water-dispersible and can increase connexin 43 activity in animals.

These new compounds can also be given by injection into a vein where they can protect against heart damage in experimental animals after an artificial heart attack. “We are also developing them for clinical use in prevention of cancer, chronic liver disease, eye disease, and damage to the heart due to short of blood supply,” Dr Bertram said.

“The new development will allow rapid and more complete absorption of carotenoids when taken by mouth. This could offer a significant advantage in future cancer prevention studies,” he concluded.

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Notes to Editors

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