Dichloroacetate: a novel anti-cancer agent

Investigator: Dr Anneke Blackburn, Cancer Metabolism and Therapy Laboratory, John Curtin School of Medical Research, The Australian National University

Grant awarded: $50,000

There is a continuing need to develop improved therapeutic strategies to avoid drug resistance and toxicity associated with currently available anti-cancer agents. Dichloroacetate (DCA) has recently been proposed as a new and non-toxic anti-cancer agent that acts via a novel process of altering cancer cell metabolism. The laboratory has previously shown the ability of DCA to inhibit the growth of metastatic breast cancer in vitro and in rats. This project will continue our fundamental investigations into the action of DCA alone and also support new studies on the interactions of DCA with other currently used anti-cancer drug combinations.

The researchers have now shown that DCA can stop the growth of existing breast cancer in mice, and are currently investigating in detail whether DCA is killing the cancer cells or just stopping them from growing. DCA alone does not eliminate the breast tumours, however, they have found that it can enhance the ability of some chemotherapy agents to kill cancer cells. They will now investigate, in human breast cancer cells grown in vitro, the ability of DCA to promote cancer cell death after treatment with the chemotherapy combinations currently used for the treatment of breast cancer.

These studies will help us determine the most effective way to make use of the anti-cancer properties of DCA in breast cancer patients to improve therapeutic outcomes.

PUBLICATIONS

Sun RC, Fadia M, Dahlstrom JE, Parish CR, Board PG, Blackburn AC. (2010) Reversal of the glycolytic phenotype by dichloroacetate inhibits metastatic breast cancer cell growth in vitro and in vivo.*Breast Cancer Res Treat.* 120(1):253-60.