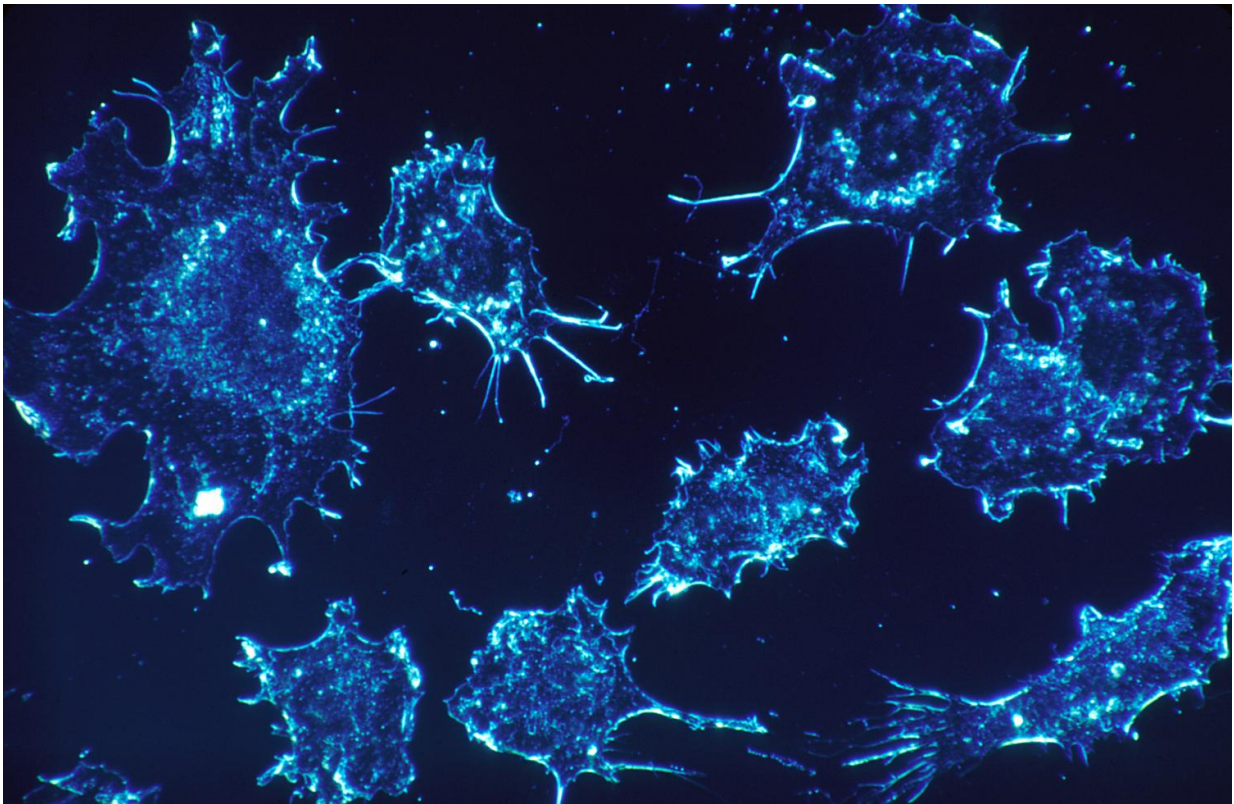


Decongestant 'highly effective' at starving cancer cells

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Cancer cells. Credit: Dr. Cecil Fox, National Cancer Institute

Cancer researchers seeking non-toxic alternatives to harmful chemotherapy are reporting a highly significant result for a humble cold remedy. N-Acetyl cysteine (NAC) is routinely used as a dietary supplement and as a decongestant given to children to ward off a cold.

Now, clinical trials in the US indicate the cheap, over-the-counter drug, is a first rate inhibitor of the tumour stroma, a cell compartment which is fundamental to the spread of cancer. The results, published in *Seminars in Oncology*, confirm a long-held theory that [cancer cells](#) are being sustained and strengthened by the presence of MCT4, a protein which 'brings them' energy, in the form of lactate, from neighbouring [cells](#).

Patients taking high dosages of NAC saw their levels of the 'transporter' protein fall by more than 80%, drastically reducing the ability of the cancer cells to feed off neighbouring cells.

Professor Federica Sotgia of the Biomedical Research Centre at the University of Salford, UK, said, "In cell cultures in the laboratory, we had seen a near complete reduction in MCT4, but to achieve such a substantial result in [breast cancer](#) patients is extremely exciting indeed."

The team, which includes Professor Michael Lisanti, of the University of Salford and US-based Ubaldo Martinez-Outschoorn, MD, conducted a 'window trial' on 12 patients awaiting surgery for breast cancer at The Sidney Kimmel Cancer Center (Thomas Jefferson University), in Philadelphia.

Patients were given maximum daily dosages of the over-the-counter drug for three weeks between diagnosis and surgery. Tumour tissue biopsies were then taken before and during surgery and key biomarkers, including MCT4 and K167, were measured post-surgery. K167 levels fell by 25% and MCT4 levels were reduced by approximately 80%.

"High levels of stromal MCT4 are extremely worrying, as they are linked to aggressive cancer behaviour and poor overall survival, so this is very encouraging result," explained Professor Lisanti. "Our idea was to repurpose an inexpensive FDA-approved drug, to examine if its antioxidant properties could target the feeding behaviour of [cancer](#) cells.

To be able to inhibit MCT4 protein expression, in a non-toxic way, is huge step forward."

The results are published in the clinical journal *Seminars in Oncology* (Articles In Press): "Pilot study demonstrating metabolic and anti-proliferative effects of in vivo anti-oxidant supplementation with N-Acetylcysteine in Breast Cancer."

More information: Daniel Monti et al. Pilot study demonstrating metabolic and anti-proliferative effects of in vivo anti-oxidant supplementation with N-Acetylcysteine in Breast Cancer, *Seminars in Oncology* (2017). [DOI: 10.1053/j.seminoncol.2017.10.001](https://doi.org/10.1053/j.seminoncol.2017.10.001)

Provided by University of Salford

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