

First results of fasting mimicking diet to support cancer patients undergoing chemotherapy

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Does fasting help make chemotherapy more effective in breast cancer patients? Researchers led by Leiden University Medical Centre (LUMC) and Breast Cancer Research Group (BOOG) are a step closer to answering that question after completing the first randomized study. They describe their auspicious results in the scientific journal *Nature Communications* .

Breast cancer is the most [common cancer](#) in women worldwide, with over 2 million new cases diagnosed per year, representing about 25 percent of all cancers in women. Like most other cancers, breast cancer depends on nutrients and [growth factors](#) to continue to grow and to resist and escape current standards of care. Conversely, short-term fasting has been shown to protect tumor-bearing mice against the toxic effects of chemotherapy, while enhancing [therapeutic efficacy](#).

Fasting mimicking diet

The DIRECT study aimed at measuring the impact of a fasting mimicking diet (FMD) on efficacy and toxicity of chemotherapy in patients with non-metastatic [breast cancer](#). The FMD was previously shown to cause a major increase in the efficacy of cancer treatment in mice, while in humans it decreased insulin and insulin-like growth factor (two growth factors that could support cancer growth) by limiting intake of both protein and glucose (given the characteristics of the diet), two essential nutrients for cancer survival.

Curtailed DNA damage

The study included 131 patients, half of whom received the FMD three days before and at the day of chemotherapy. The other half kept their normal eating pattern. Various analyses revealed that the tumor was more likely to shrink in patients receiving the FMD. Toxicity was similar in both groups. However, the FMD significantly curtailed DNA damage in [white blood cells](#) (lymphocytes), suggesting that it protected against chemotherapy-induced cellular damage. Based on this study, the researchers cannot draw any conclusions about the effect of the diet on (disease-free) survival.

Additional research

The DIRECT study represents the first clinical trial on the efficacy of a fasting mimicking diet as an adjunct to chemotherapy. 'Although the study is a steppingstone in cancer dietary management, and shows potential efficacy on cancer cell loss, additional research should further demonstrate the impact of the FMD on cancer treatment outcome', said internist-oncologist Judith Kroep. 'However, the study is an important step on the road towards the use of the FMD as an adjunct to cancer therapy, as a safe and effective alternative to current diets, rich in proteins (especially of animal source) and refined sugars.'

More information: Fasting mimicking diet as an adjunct to neoadjuvant chemotherapy for breast cancer in the multicentre randomized phase 2 DIRECT trial, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-16138-3](https://doi.org/10.1038/s41467-020-16138-3)

Provided by Leiden University

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