

Sugar supplement slows tumor growth and can improve cancer treatment

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Mannose sugar, a nutritional supplement, can both slow tumour growth and enhance the effects of chemotherapy in mice with multiple types of cancer.

This lab study is a step towards understanding how mannose could be used to help treat [cancer](#).

The results of the study, which was funded by Cancer Research UK and Worldwide Cancer Research, are published in *Nature*, today (Wednesday).

Tumours use more glucose than normal, healthy tissues. However, it is very hard to control the amount of glucose in your body through diet alone. In this study, the researchers found that mannose can interfere with glucose to reduce how much sugar cancer cells can use.

Professor Kevin Ryan, lead author from the Cancer Research UK Beatson Institute, said: "Tumours need a lot of glucose to grow, so limiting the amount they can use should slow cancer progression. The problem is that normal tissues need glucose as well, so we can't completely

remove it from the body. In our study, we found a dosage of mannose that could block enough [glucose](#) to slow tumour growth in mice, but not so much that normal tissues were affected. This is early research, but it is hoped that finding this perfect balance means that, in the future, mannose could be given to cancer patients to enhance chemotherapy without damaging their overall health."

The researchers first examined how mice with pancreatic, lung or skin cancer responded when mannose was added to their drinking water and given as an oral treatment. They found that adding the supplement significantly slowed the growth of tumours and did not cause any obvious side effects.

To test how mannose could also affect cancer treatment, mice were treated with cisplatin and doxorubicin—two of the most widely used chemotherapy drugs. They found that mannose enhanced the effects of chemotherapy, slowing tumour growth, reducing the size of tumours and even increasing the lifespan of some mice.

Several other cancer types, including leukaemia, osteosarcoma, ovarian and bowel cancer, were also investigated. Researchers grew cancer cells in the lab and then treated them with mannose to see whether their growth was affected.

Some cells responded well to the treatment, while others did not. It was also found that the presence of an enzyme that breaks down mannose in cells was a good indicator of how effective treatment was.

Professor Kevin Ryan added: "Our next step is investigating why [treatment](#) only works in some cells, so that we can work out which patients might benefit the most from this approach. We hope to start clinical trials with mannose in people as soon as possible to determine its true potential as a new

cancer therapy."

Mannose is sometimes used for short periods to treat urinary tract infections, but its long-term effects have not been investigated. It's important that more research is conducted before mannose can be used in [cancer patients](#).

Martin Ledwick, Cancer Research UK's head nurse, said: "Although these results are very promising for the future of some cancer treatments, this is very early research and has not yet been tested in humans. Patients should not self-prescribe mannose as there is a real risk of negative side effects that haven't been tested for yet. It's important to consult with a doctor before drastically changing your diet or taking new supplements."

More information: Pablo Sierra Gonzalez et al, Mannose impairs tumour growth and enhances chemotherapy, *Nature* (2018). [DOI: 10.1038/s41586-018-0729-3](#)

Provided by Cancer Research UK

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