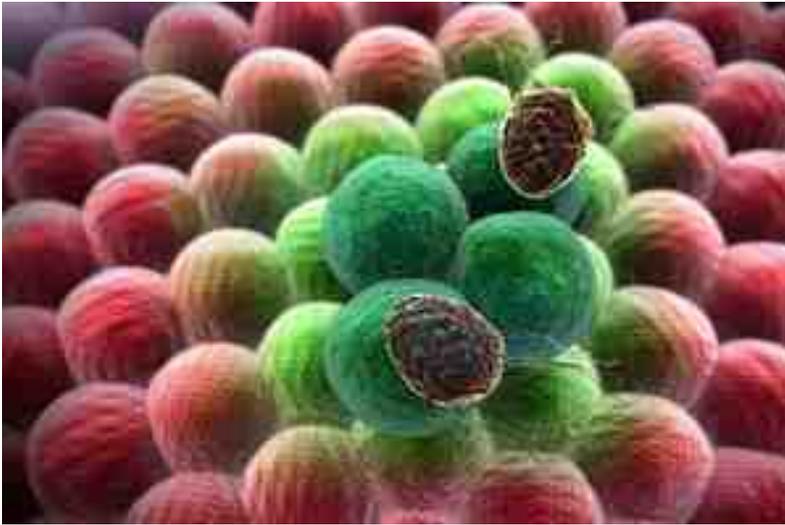


# Cancer cells programmed back to normal by US scientists

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For the first time, aggressive breast, lung and bladder cancer cells have been turned back into harmless benign cells. Photo / iStock / Getty Images

Cancer cells have been programmed back to normal by scientists in a breakthrough which could lead to new treatments and even reverse tumour growth.

For the first time, aggressive breast, lung and bladder cancer cells have been turned back into harmless benign cells by restoring the function which prevents them from multiplying excessively and forming dangerous growths.

Scientists at the Mayo Clinic in Florida in the US said it was like applying the brakes to a speeding car.

So far it has only been tested on human cells in the lab, but the researchers are hopeful that the technique could one day be used to target tumours so that cancer could be "switched off" without the need for harsh chemotherapy or surgery.

"We should be able to re-establish the brakes and restore normal cell function," said Professor Panos Anastasiadis, of the Department for Cancer Biology.

"Initial experiments in some aggressive types of cancer are indeed very promising. It represents an unexpected new biology that provides the code, the software for turning off cancer."

Cells need to divide constantly to replace themselves. But in cancer the cells do not stop dividing, leading to huge cell reproduction and tumour growth.

The scientists discovered that the glue which holds cells together is regulated by biological microprocessors called microRNAs. When everything is working normally, the microRNAs instruct the cells to stop dividing when they have replicated sufficiently.

They do this by triggering production of a protein called PLEKHA7 which breaks the cell

bonds. But in cancer that process does not work.

Scientists discovered they could switch on cancer in cells by removing the microRNAs from cells and preventing them from producing the protein.

And, crucially, they found that they could reverse the process, switching the brakes back on and stopping cancer. MicroRNAs are small molecules which can be delivered directly to cells or tumours so an injection to increase levels could switch off disease.

"We have now done this in very aggressive human cell lines from breast and bladder cancer," added Prof Anastasiadis. "These cells are already missing PLEKHA7. Restoring either PLEKHA7 levels, or the levels of miRNAs in these cells turns them back to a benign state. We are now working on better delivery options."

Cancer experts in Britain said the research solved a riddle that biologists had puzzled over for decades, why cells did not naturally prevent the proliferation of cancer.

"This is an unexpected finding," said Dr Chris Bakal, a specialist in how cells change shape to become cancerous, at the Institute for Cancer Research in London.

The research was published in the journal Nature Cell Biology.

- [Daily Telegraph UK](#)