

Are we on the brink of a UNIVERSAL cancer cure? Cutting off key supply routes to starve diseased cells of nutrients 'eradicates tumors'

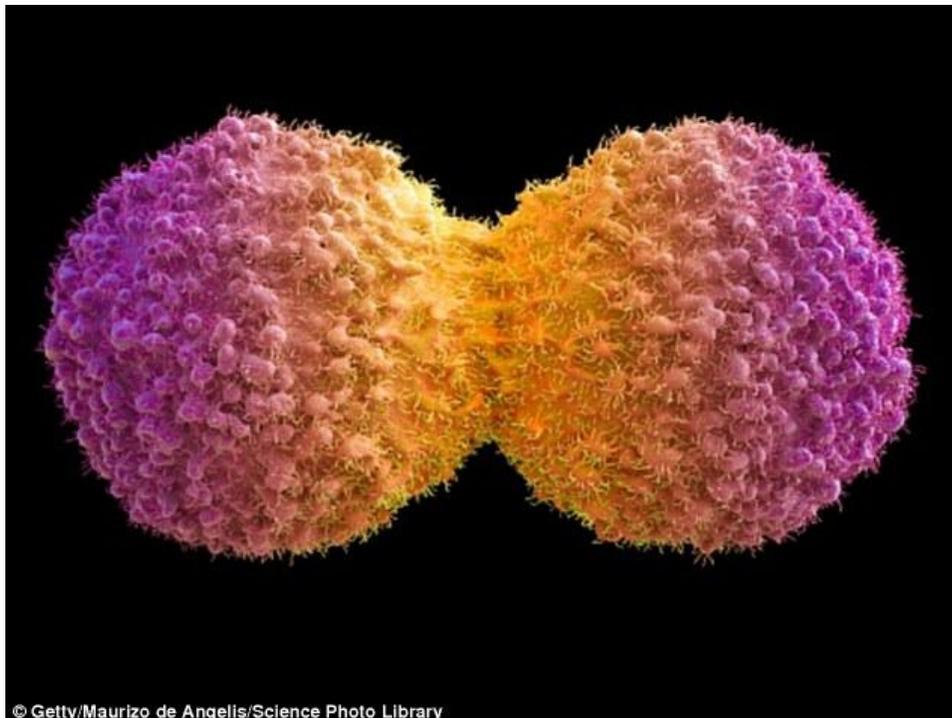
By Lizzie Parry For Dailymail.com, www.dailymail.co.uk
May 5th, 2016

The key to beating cancer could lie in the ability to cut off vital nutritional supply lines that fuel the disease and allow it to grow, experts have revealed. They have identified a key supply route that diseased cells manipulate, to obtain nutrients.

The discovery could herald new treatments that act to stop the growth of tumours, researchers said.

To arrive at their findings, a team from The Australian National University, blocked gateways through which the cancer cell was obtaining the amino acid glutamine.

They found the cells almost completely stopped growing.



Starving cancer cells of the nutrients they require to grow and spread, illustrated, could help tackle the disease after scientists discovered cutting off the supply lines to stop the disease growing

Professor Stefan Bröer, who led the study, said: 'This is likely to work in a wide range of cancers, because it is a very common mechanism in cancer cells.'
'Better still, this should lead to chemotherapy with much less serious side-effects, as normal cells do not use glutamine as a building material.
'Crucial white blood cells, which current treatments damage, could be spared, and it could cut out the hair loss that chemotherapy causes.'
There are 917 different types of cancer currently identified, and many cures work only for a single type of the disease.
Furthermore, many treatments are rendered ineffective as cancers develop resistance to chemotherapy.
However, Professor Bröer, a biochemist at the university's Research School of Biology, said the new approach would be less prone to resistance because blocking the glutamine transport mechanism is an external process that would be hard for cancer cells to get around.
His team first attempted a glutamine blockade by genetically altering cancer cells to disable their main glutamine transporter.
However, it was not very effective, Professor Bröer said.



Experts say the discovery could lead to chemotherapy with much less serious side-effects. Furthermore, it is hoped the treatment could prove more effective because, unlike current options, it is less likely to develop a resistance to chemotherapy

'It was not quite as simple as we thought,' he said. 'The cells set off a biochemical alarm, which opened a back door in the cell so they could still get the glutamine they needed.'

Once the researchers disabled the second gateway, by turning off the biochemical alarm with a technique known as RNA silencing, the cells' growth reduced by 96 per cent.

Lead author Angelika Bröer spearheaded the effort to identify and genetically knock out glutamine transporters.

'It is an exciting time to do cancer research,' she said.

'We now have precision tools in our hands to manipulate the genome of cancer cells, allowing us to address problems that were difficult to solve previously.'

Now the importance of glutamine gateways have been identified in cancer, the hunt is on to find drug treatments that will lock them down and kill the disease.

Ms Bröer added: 'we have developed a set of tests, which make it very easy to determine if a drug is targeting glutamine transporters.'

'This means we can set robots to work that will test tens of thousands of drugs for us over the next year or two.'

The results are published in the Journal of Biological Chemistry.