

Researchers find potential anti-cancer use for anti-epilepsy drug

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Scientists at the University of York have discovered that a drug used widely to combat epilepsy has the potential to reduce the growth and spread of breast cancer.

Researchers in the Department of Biology at York studied [phenytoin](#), a drug which inhibits epilepsy by targeting sodium channels.

These channels, known as VGSCs, exist in the membranes of excitable cells, such as neurons, where they are involved in transmission of electrical impulses. They are also present in [breast cancer cells](#) where they are thought to help the spread of tumours.

In research published in *Molecular Cancer*, the York team found that "repurposing" antiepileptic drugs, such as phenytoin, that effectively block the [sodium channels](#), could provide a novel therapy for cancer.

Despite extensive work to define the molecular mechanisms underlying the expression of VGSCs and their pro-invasive role in cancer cells, there is little clinically relevant in vivo data exploring their value as [potential therapeutic targets](#).

The researchers found that treatment with phenytoin, at doses equivalent to those used to treat epilepsy significantly reduced tumour growth in a preclinical model. Phenytoin also reduced cancer cell proliferation in vivo and invasion into surrounding mammary tissue.

Dr Will Brackenbury, who led the research, said: "This is the first study to show that phenytoin reduces both the growth and spread of [breast cancer](#) tumour cells. This indicates that re-purposing antiepileptic and antiarrhythmic drugs is worthy of further study as a potentially novel anti-cancer therapy."

More information: The paper 'The sodium channel-blocking antiepileptic drug phenytoin inhibits breast tumour growth and metastasis' is published in *Molecular Cancer*: www.molecular-cancer.com/content/14/1/13/abstract

Provided by University of York

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