

New research provides hope for patients with hard-to-treat breast cancer

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Micrograph showing a lymph node invaded by ductal breast carcinoma, with extension of the tumour beyond the lymph node. Credit: Nephron/Wikipedia

UK scientists have found a new way to slow the growth of the most aggressive type of breast cancer, according to research published in the journal *Oncogene* today.

The team from Oxford University and the University of Nottingham found that using a drug called JQ1 can alter how [cancer cells](#) respond to hypoxia—or low oxygen—found in more than 50 per cent of [breast tumours](#) overall and most commonly in triple negative [breast cancer](#), the form of the disease that is hardest to treat.

JQ1 works by stopping cancer cells adapting to the lack of oxygen. The study results showed that JQ1 slowed tumour growth and limited the number of [blood vessels](#) that were produced.

When a patient's breast cancer is starved of oxygen it can be much more difficult to treat successfully. That's because the way cancer cells adapt to low oxygen changes their biology and makes them resistant to [standard therapies](#). When there are low levels of oxygen, tumour cells turn on specific genes which send signals for new blood vessels to supply them with fresh oxygen, giving cancer the nutrients it needs to grow and spread. Dr Alan McIntyre, co-author of the study, at the University of Nottingham, said: "Triple negative breast cancer is a challenge. By tackling hypoxia that so often compromises the treatment of breast cancers, JQ1 could be an important key to helping women with aggressive breast tumours."

The study explains how the family of drugs to which JQ1 belongs works. Although this group of drugs—called bromodomain and extraterminal inhibitors or BETi—has been used to treat cancer before, this study sheds light on the role these drugs could play in hypoxia, which could prove vital for patients with hard-to-treat breast cancers.

Nell Barrie, Cancer Research UK's senior science communications

manager, said: "This study has unearthed insights into how these drugs could be used to help treat triple negative [breast cancer patients](#) for who urgently need better treatments. Interfering with the body's natural response to hypoxia, or low oxygen, could be a way to stop the spread of cancer. More studies should be carried out to measure how effective JQ1 could be in patients."

Dr Richard Berks, senior research communications officer at Breast Cancer Now which also supported the study, said: "The ability of breast cancers to adapt to a lack of [oxygen](#) is one of the key features that helps them become resistant to standard therapies. Finding a way to thwart this process could therefore be an important avenue for developing new treatments.

"This study adds to evidence suggesting that a class of drugs known as BET inhibitors, which are already in clinical trials for other cancers, could be effective for treating aggressive breast cancers.

"We desperately need to find more effective treatments for these particularly aggressive forms of breast cancer, such as triple negative, and if confirmed this finding could represent a real step forward."

More information: McIntyre et al. 'The BET Inhibitor JQ1 Selectively Impairs Tumour Response to Hypoxia and Downregulates CA9 and Angiogenesis in Triple Negative Breast Cancer (TNBC)' *Oncogene*. 2016.

Provided by Cancer Research UK

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