

# Scientists make breast cancer advance that turns previous thinking on its head

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UEA scientists make breast cancer advance that turns previous thinking on its head Scientists at the University of East Anglia have made an advance in breast cancer research which shows how some enzymes released by cancerous cells could have a protective function.

New research published today in the *Journal of Biological Chemistry* reveals that an enzyme called MMP-8 (matrix metalloproteinase-8) could be acting as a locator to the immune system, which then becomes activated to attack tumours. It was originally thought that the production of MMPs by [breast cancer cells](#) worked to promote [cancer growth](#).

Lead researcher Prof Dylan Edwards from UEA's School of Biological Sciences said: "MMPs are a family of enzymes that are released from cancer cells. They were once thought to act like '[molecular scissors](#)' to snip away at the scaffolding structures outside cells and clear a path for the cancer cells to invade and spread to other organs.

"Drugs that target this broad family of enzymes were trialled to treat cancer in the 1990s but largely failed. This led us to think that not all of these enzymes were bad guys that promoted tumour growth and spread."

Scientists from UEA worked with clinicians at the Norfolk and Norwich University Hospital to look in detail at the patterns of MMPs in breast tumours from patients. Previous research published in 2008 revealed that one of these enzymes, known as MMP-8, has a protective role which holds tumours in check. And patients whose [breast tumours](#) have more

of this particular enzyme seemed to have better outcomes.

The latest research was funded by cancer charity the Big C and carried out by PhD student Sally Thirkettle. Prof Edwards said: "She has shown that if she makes [breast cancer](#) cells produce MMP-8, it causes them to produce two other inflammatory factors (IL-6 and IL-8) that have previously been shown to promote cancer. However, breast tumour cells that over-produce MMP-8 don't survive long-term - the enzyme stops them growing."

"We now think that in tumours, MMP-8 acts as a sort of 'find me' signal to the immune system, which then becomes activated to attack the tumour, which may help to explain its protective function.

"The fact that a protective enzyme such as MMP-8 was also blocked by the first generation anti-MMP drugs used in the 1990s also partly explains why these drugs failed in the clinic," he added.

It is still unknown exactly how MMP-8 causes IL-6 and IL-8 to be activated - but the findings are an important step forward which will help direct further research.

**More information:** 'Matrix metalloproteinase-8 (collagenase-2) induces the expression of interleukins-6 and -8 in breast cancer cells' by Sally Thirkettle, Julie Decock, Hugh Arnold, Caroline J Pennington and Dylan R Edwards (all UEA, UK) and Diane M Jaworski (University of Vermont College of Medicine, US) is published in the *Journal of Biological Chemistry* on May 24, 2013.

Provided by University of East Anglia

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