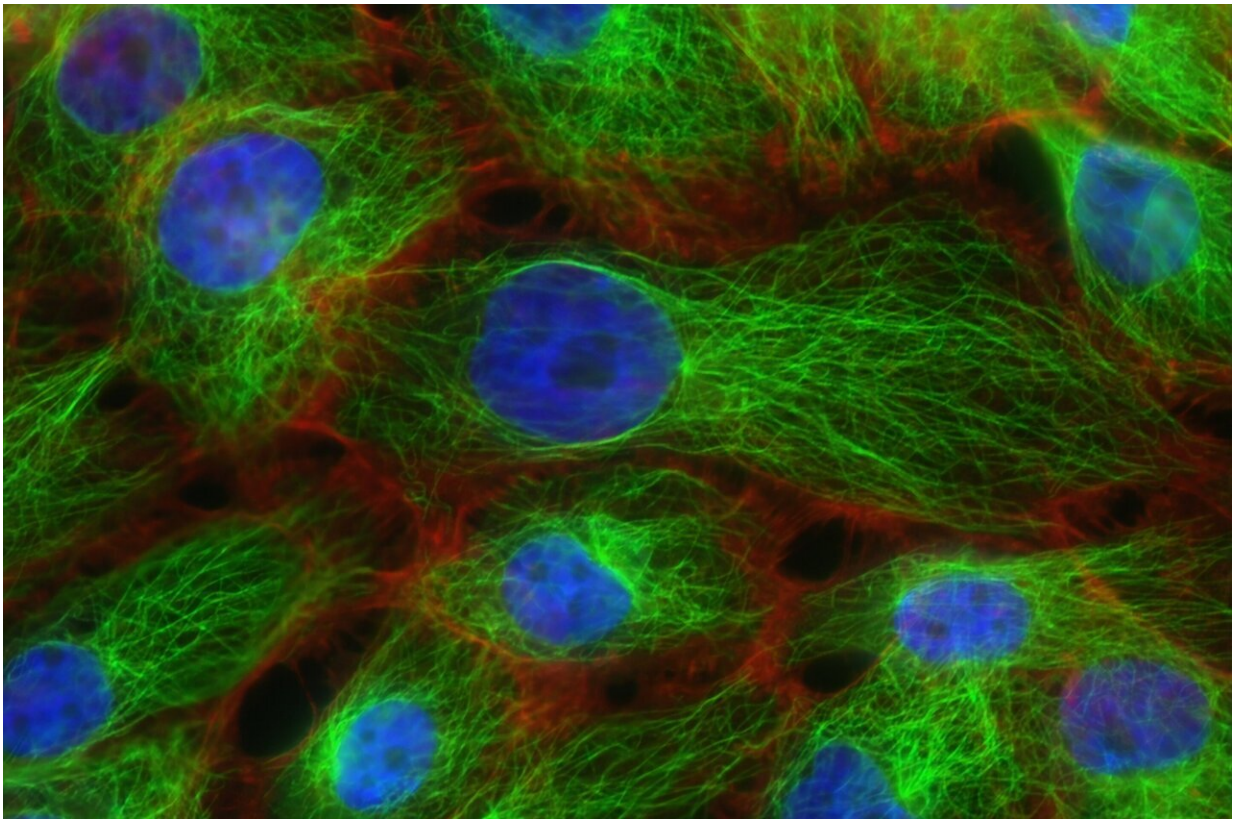


Scientists create tailored drug for aggressive breast cancer

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Scientists have used breast cancer cells' weakness against themselves by linking a tumor-selective antibody with a cell-killing drug to destroy hard-to-treat tumors.

The research, published in *Clinical Cancer Research* by a team from King's College London, marks a new method in [cancer treatment](#).

The discovery is particular to triple negative breast cancer, which makes up 15% of all diagnosed breast cancer. This type of breast cancer is typically aggressive, resistant to chemotherapy, has a lower survival rate and is more common in women under 40.

Usual treatment involves surgery, chemotherapy and radiotherapy; however, this type of cancer can evade the drugs and return to spread again.

The scientists conducted data analysis using over 6,000 breast cancer samples to investigate the properties of breast cancer cells that are associated with aggressive and chemotherapy-resistant cancers.

They studied the cancer's biology, what is expressed in the tumor and the [cell surface](#), and the cell's insides to understand how the cancer cells escape from cancer drugs. They established the presence of the cancer cell surface marker EGFR along with oncogenic molecules cyclin-dependent kinases (CDK), which are responsible for [cell division](#) and proliferation.

They used this knowledge against the cancer cells to link cetuximab, a tumor-selective antibody that targets the EGFR protein expressed in this type of cancer, with a CDK-blocking drug to create a tailored drug for breast cancer. Because the antibody drug conjugate specifically targets the cancer cell, it may be possible to administer a lower inhibitor dose than usual, which means it's less toxic for the patient.

Lead author Professor Sophia Karagiannis, from King's College London, said, "We were on the hunt for cancer's vulnerabilities and now we've found out how we can guide our therapies to one of these. We combined

these two drugs to create a tailored antibody drug conjugate for patients with this aggressive cancer. The antibody guides the toxic drug directly to the cancer cell which offers the possibility for a lower dose and less adverse side effects to be experienced.

"More work needs to be done before this therapy can reach the clinic, but we expect that this can offer new treatment options for cancers with unfavorable prognosis. Beyond this antibody drug conjugate, we hope that our concept will lead the way for new antibody drug conjugates of this type to be tailored to patient groups likely to benefit."

Lead research scientist Dr. Anthony Cheung, from King's College London, noted, "Triple negative breast cancer represents a molecularly and clinically diverse disease. By exploiting EGFR overexpression and dysregulated cell cycle molecules in selected patient groups, the antibody drug conjugate, but not the antibody alone, could stop the cancer cell from dividing and engender cytotoxic functions specifically against the cancer cells."

Dr. Simon Vincent, director of services, support and influencing at Breast Cancer Now, added, "Each year, around 8,000 women in the UK are diagnosed with triple negative breast cancer, which is typically more aggressive than other breast cancers and more likely to return or spread following treatment. This exciting research has not only improved our understanding of the properties of aggressive breast cancer cells that are resistant to chemotherapy but has also brought us closer to developing a [targeted therapy](#) that destroys these [cancer cells](#) while minimizing side effects for patients.

"While further research is needed before this treatment can be used in people, this is an exciting step forward in developing targeted therapies for triple negative [breast cancer](#), and we look forward to seeing how these findings could lead to new and effective ways of tackling this

devastating disease."

More information: Anthony Cheung et al, Anti-EGFR antibody-drug conjugate carrying an inhibitor targeting CDK restricts triple-negative breast cancer growth, *Clinical Cancer Research* (2024). [DOI: 10.1158/1078-0432.CCR-23-3110](https://doi.org/10.1158/1078-0432.CCR-23-3110)

Provided by King's College London

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