Scientists develop new monoclonal antibody to treat HER2-positive breast cancer

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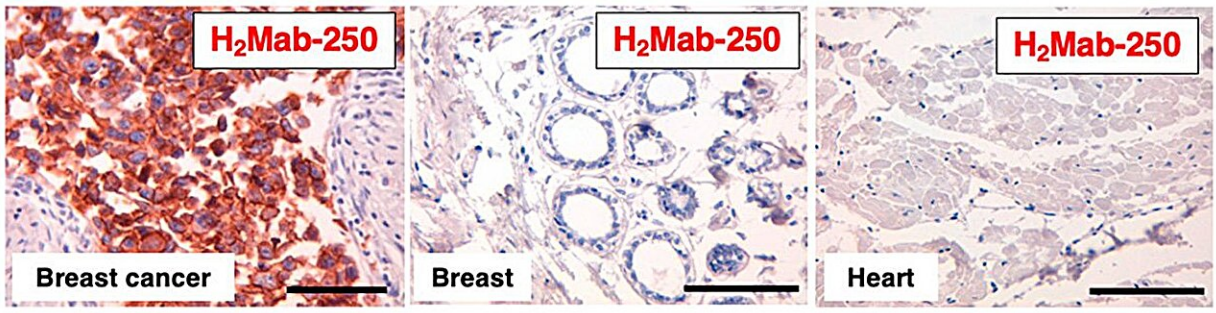

By specifically targeting HER2-positive cells, the monoclonal antibody inhibits the growth and division of cancerous cells while minimizing damage to adjacent healthy tissue. Credit: *International Journal of Molecular Sciences* (2024). DOI: 10.3390/ijms25031941

In a step forward for breast cancer treatment, researchers at Tohoku University have developed a novel monoclonal antibody that specifically targets a certain type of breast cancer cell. Their findings, published in the *International Journal of Molecular Sciences*, offer a new tool for treating this disease.

Breast cancer remains a significant global health concern that afflicts millions of people each year. The HER2-positive subtype of breast cancer is one of the most aggressive and challenging to treat. Approximately 20% of breast cancer cases are classified as

HER2-positive, meaning that there is an urgent need for therapies targeted to this specific subtype.

A research team led by Yukinari Kato rose to this challenge by developing a monoclonal antibody that precisely targets HER2-positive breast cancer cells. Monoclonal antibodies are specialized proteins engineered to recognize and bind to specific targets with exceptional precision.

HER2-positive breast cancer cells have more of the HER2 protein on their surface than healthy cells. This protein plays an important role in cell growth and division, and the excess of HER2 is one reason HER2-positive tumors are aggressive. By specifically targeting HER2-positive cells, the antibody disrupts their growth and proliferation while minimizing harm to surrounding healthy tissue.

"The development of this antibody represents a significant milestone in our ongoing efforts to advance breast cancer treatment," says Kato. "By targeting HER2-positive breast cancer cells with precision, we can offer patients a more effective and less toxic treatment option."

The new antibody offers a more targeted and selective approach than conventional treatments, such as chemotherapy, which can cause significant collateral damage to healthy cells. This precision not only enhances the efficacy of treatment but also reduces the incidence and severity of side effects, greatly improving the quality of life of breast cancer patients.

The project is set to move to the next phase, which will include clinical trials and regulatory approval processes. The researchers will also explore potential applications of other novel antibodies in various therapeutic areas, assessing whether they can improve outcomes for people battling other types of cancer.

More information: Mika K. Kaneko et al, A Cancer-Specific Monoclonal Antibody against HER2 Exerts Antitumor Activities in Human Breast Cancer Xenograft Models, *International Journal of Molecular Sciences* (2024). DOI: 10.3390/ijms25031941