

# Molecular imaging finds novel way to knock down breast cancer

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For years researchers have been developing molecular imaging techniques that visualize hormonally active breast cancer cells—specifically those testing positive for human epidermal growth factor receptor 2 (HER2). A recent innovation in breast cancer biomarkers seeks the HER3 receptor instead, which could mean more comprehensive breast cancer imaging and potential treatments, say experts presenting data during the Society of Nuclear Medicine and Molecular Imaging's 2014 Annual Meeting.

Breast cancer is one of the most prevalent forms of cancer among women. Certain kinds of tumors have been found to be more aggressive and associated with less than favorable prognoses compared to others. HER2 positive tumors are a hallmark of high-risk breast cancer. Emerging molecular imaging agents join tumor-seeking antibodies and signaling radioisotopes in one radiopharmaceutical that is injected at the time of imaging in order to track and report active receptors.

One of these investigational agents, known in the lab as Cu-64 DOTA-HER3 F(ab')<sub>2</sub>, does just that by hunting down HER3, a messenger that has been shown to speak for HER2-positive cancers in multiple tissue models when used in conjunction with a scanner called a [positron emission tomography](#) (PET) imaging system. This could encourage better, more personalized care for [breast cancer patients](#).

"HER3 is thought to be an important mediator of resistance to the HER2 inhibitors class of anti-cancer therapies, which are used to treat

HER2-positive breast cancer representing approximately 20 percent of all breast cancers," said principal author Eric P. Wehrenberg-Klee, MD, from Massachusetts General Hospital in Boston, Mass. "Imaging of HER3 expression may allow for better understanding of how prevalent HER3 over-expression is among HER2 positive breast cancer patients, which in turn may allow for appropriate patient selection for the addition of HER3 inhibitors currently in clinical development."

The researchers expect that it may be another year or two before the agent will reach regulatory approval and enter general clinical practice.

An estimated 232,670 new cases of [invasive breast cancer](#) will be diagnosed in women this year, according to 2014 data from the American Cancer Society. Approximately 40,000 women will die from [breast cancer](#) this year.

**More information:** Scientific Paper 550: Eric Wehrenberg-Klee, N. Selcan Turker, Bryan Chang, Pedram Heidari, Umar Mahmood, Massachusetts General Hospital, Boston, MA, "Development of a HER3 PET probe for breast cancer imaging," SNMMI's 61th Annual Meeting, June 7–11, 2014, St. Louis, Missouri.

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