

Deciphering the male breast cancer genome

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Male breast cancer has distinct alterations in the tumor genome that may suggest potential treatment targets, according to a study by Weill Cornell Medicine investigators. They have conducted the first whole genome sequencing analysis of male breast cancer, which looked at the complete DNA landscape of tumor samples from 10 patients.

This is an important step in viewing breast cancer in men, which represents less than 1% of all breast cancer cases each year, as a unique disease. Though most research has focused on women with breast cancer, the incidence in men has increased at a much faster rate than in women over the last 40 years. Also, most men are unaware of their risk, so they tend to be diagnosed at more advanced stages and have poorer treatment outcomes.

The [study](#), published on Feb. 16 in *Modern Pathology*, uncovered gene mutations and molecular profiles that could impact diagnosis and treatment. The researchers found mutations in several genes that are known to drive cancer growth. They also identified structural variants—places in the genome where DNA has broken and rearranged—that impact five other cancer-associated [genes](#).

Two men had variations in the BRCA2 gene that impairs DNA repair, a common cause of breast cancer in women. Along with an extended study group of 18 additional tumor samples, about 21% of the tumors had 10 to 20 excess copies of the FGFR1 gene, which is linked to treatment-resistant tumors in some women with breast cancer and is a [drug target](#) already.

The good news is that cancer therapies are available to target the genetic variations identified in 8 of the 10 men, opening new pathways to treatment. For example, drugs such as immunotherapy and PARP inhibitors might be effective for men with BRCA2 gene variations and a high number of tumor mutations. Cancer-triggering rearrangements in the NTRK1 gene may respond to drugs called [kinase inhibitors](#). In addition, the gene mutations identified here may lead to the discovery of new targeted therapies.

Though larger studies will need to confirm the research results, the novel findings suggest that tailoring treatments for this under-studied male

patient population will be necessary, said the authors.

More information: Majd Al Assaad et al, Whole-Genome Sequencing Analysis of Male Breast Cancer Unveils Novel Structural Events and Potential Therapeutic Targets, *Modern Pathology* (2024). [DOI: 10.1016/j.modpat.2024.100452](https://doi.org/10.1016/j.modpat.2024.100452)

Provided by Weill Cornell Medical College

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