Caper Peptides for the Treatment of Cancer

Lead Inventors

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Unmet Need

Breast cancer is a leading cancer among women and is a major cause of death worldwide. Globally, one out of eight women will face a diagnosis of breast cancer this year. Breast cancer is not just one disease but comprises many different types, with different treatments, and clinical outcomes.

In the case of estrogen receptor (ER) positive breast cancer, estrogens stimulate mammary epithelial cell proliferation and contribute to the development and progression of the disease. To treat ER-positive breast cancer patients, endocrine targeted therapies are commonly used. However, 40-50% of these patients do not respond or develop resistance to these therapies and therefore additional treatment options are needed.

In a triple negative breast cancer (TNBC) diagnosis, the three most common types of receptors known to fuel breast cancer growth – estrogen, progesterone, and the HER2/neu gene – are not present in the tumor. As such, common treatments like hormone therapy and drugs that target estrogen, progesterone and HER2 are ineffective, leaving toxic chemotherapy and radiation as the only options for TNBC patients. Novel therapeutic strategies aiming at specific targets overactivated inside TNBC are thus urgently needed.

Opportunity

The Saint Joseph's University research team has uncovered RBM39 / CAPER as a novel therapeutic target inside breast cancer cells. CAPER has been shown to be overexpressed in these cancer cells and seems to be helping the cancer thrive and survive.

Targeted cancer therapy is becoming a leading approach to cancer treatment and Dr. Jasmin and his team believe the CAPER-derived peptides they have developed may pave the way for a targeted treatment to help reduce the use of or replace toxic chemotherapy. Alternately, it may serve as a treatment option for those who are or become resistant to current therapy options.

These innovative peptides could serve as a targeted approach to treat both ER-positive and triple negative breast cancers.

Unique Attributes

CAPER peptides directly bind to c-Jun and the ER and inhibit endogenous CAPER's co-activator actions which impairs DNA repair, promotes DNA damage and induces apoptosis in breast cancer cells with no significant change being seen in normal breast epithelial cells. This could provide an opportunity for a new targeted cancer treatment with a low toxicity profile. These CAPER peptides could also be used to sensitize tumor cells to currently used chemo and / or radiotherapies.

Clinical Applications

Initially this invention has potential as a therapeutic agent for both triple negative and estrogen receptor positive breast cancers. However, as CAPER have been implicated in other types of cancer, it may work as a therapeutic in many other cancers, including brain and lung cancers.

With development, the invention could result in a drug beneficial to people who become resistant to common drugs such as tamoxifen.

Additionally, these peptides could be encapsulated in nanoparticles or liposomes to allow for better ADME properties.

Stage of Development

In vitro testing in breast, brain, and lung cancer cells.

Intellectual Property

International Patents: EP3969027, February 2024; ES2981111T3, October 2024

US Patent No. US 12,201,671 B2, issued January 2025

US Divisional Application No. US20250127852A1, published April 2025

Canadian Patent Application No. CA3140026A1, published November 2020

Collaboration or Licensing Opportunity

Actively seeking licensee for commercialization or collaboration to complete preclinical studies.

References and Publications

- Chilewski SD et al. Development of CAPER peptides for the treatment of triple negative breast cancer. Cell Cycle. 2020 Feb;19(4):432-447.
- Campbell MC et al. CAPER as a therapeutic target for triple negative breast cancer. Oncotarget. 2018 Jul 13;9(54):30340-30354.
- Mercier I et al. CAPER, a novel regulator of human breast cancer progression. Cell Cycle. 2014;13(8):1256-64.

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