Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

MicroRNAs to Diagnose and Treat Triple-Negative Breast Cancer

Category
Diagnostics – Biomarker

Problem
Need for identification of triple-negative breast cancers which do not respond to hormone therapy

Technology Overview
miRNA screen for identifying triple-negative breast cancers

IP Status
- Patent Issued in US
- Available for Exclusive or Non-Exclusive Licensing

Value Proposition
- Diagnostic tool for determining if a cancer sample is triple-negative or ER positive
- Screening results help tailor miRNA treatment for patients

Market Attractions
- Most prevalent type of cancer in women
- microRNA an emerging market with CAGR of 18.6%, expected to reach $626M by 2025

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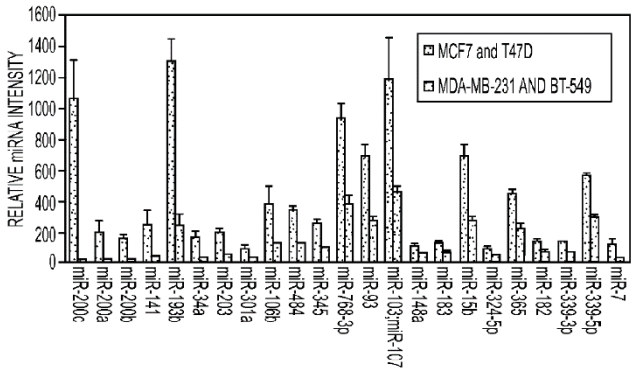
Problem:

Worldwide, breast cancer is the second most common type of cancer after lung cancer (10.4% of all cancer incidence) and ranks fifth in causing cancer deaths. Triple-negative breast cancers (ER–, PR–, HER2–) make up about 10-20% of all breast cancers and are, depending on the grade, more aggressive than other breast cancers.

Patients with triple-negative breast cancer often have increased risk for recurrence and meta-stasis as well as decreased 5-year survival. Since triple-negative breast cancers do not depend on estrogen or progesterone receptors or HER2 for growth, they do not respond to traditional hormone or HER2- dependent therapies. Consequently, identifying cases of triple-negative breast cancer is important for selecting an effective therapy for these patients.

Technical Solution and Key Value Propositions:

A research team from the University of Colorado led by Jennifer Richer has developed a miRNA screen for identifying triple-negative breast cancers. The team identified 5 miRNAs dysregulated in triple-negative breast cancer that affect the biology of these tumors. Screening for miRNAs related to aggressive properties of these tumors and and comparing them to levels in luminal ER positive breast cancer provides the possibility of treating the identified cancers with these miRNAs or agents that affect their levels. From screening results, miRNA treatment to correct the dysregulated miRNAs can be tailored to each patient. This technology streamlines the identification of triple-negative breast cancers and ER+ that acquire similar biology and provides information towards miRNA-based therapeutics.



(Left): Examples of miRNAs significantly dysregulated in triple-negative versus luminal breast cancer.

Key Documents and Sources:

- "miRNAs Dysregulated in Triple-Negative Breast Cancer." U.S. 8,507,195 issued Aug. 13, 2013
- miR-200c targets a NF-kB up-regulated TrkB/NTF3 autocrine signaling loop to enhance anoikis sensitivity in triple negative breast cancer. PLoS One. 2012; 7 (11): e49987
- The miR-200 and miR-221/222 microRNA families; opposing effects on epithelial identity. J Mammary Gland Bio Neoplasia. 2012 Mar;17(1):65-77.