Docket #: S24-165

BCL11B as a Biomarker for Breast Cancer Patients to Improve Chemotherapy Efficacy Utilizing TNF-? Treatment

Systemic chemotherapy remains the main treatment option for malignant tumors, including breast cancer. Nevertheless, the frequent development of resistance in tumors often causes treatment failure and patient death, presenting a significant challenge in cancer treatment. Breast cancer is a highly heterogeneous disease that exhibits various responses to chemotherapy treatment. However, there is no available biomarker that can predict drug responses in breast cancer patients, which largely impedes the development of targeted therapy for cancer patients at high risk of chemoresistance.

The Clarke Lab at Stanford has uncovered a novel biomarker, BCL11B, in breast cancer that is associated with an increased risk of relapse after chemotherapy. Using this biomarker, the inventors have developed a method to identify a subset of breast cancer patients at higher risk of developing chemotherapy resistance. The invention also features a method of enhancing chemotherapy efficacy in tumors expressing BCL11B+ by combining TNF-? treatment with chemotherapy. This novel method can help determine which patients may be resistant to chemotherapy and which patients may benefit from a combination TNF-? and chemotherapy treatment, resulting in better patient outcomes.

Stage of Development
Research – in vivo

Applications

- Breast cancer screening, such as with immunohistochemistry techniques or single-cell mRNA sequencing

Advantages

- There is currently no widely recognized biomarker that can predict chemotherapy responses and serve as a target for the treatment of breast cancer. In addition, there is currently no way of identifying breast cancer patients who would benefit from a combination TNF-? and chemotherapy treatment.

Patents

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