

Prognostic Marker for Breast Cancer Treatment

Around a quarter to a third of breast cancer patients have an aggressive form of the disease attributed to multiple copies of the HER2 gene. Patients are therefore screened for the number of HER2 genes present in the nucleus of their tumor cells, and those bearing extra copies of the gene receive trastuzumab therapy. However, trastuzumab only is effective in a small fraction of HER2+ patients. Thus, HER2 overexpression alone does not ensure response to targeted therapy.

Another prognostic indicator of breast cancer is cyclin E, which, like HER2, is involved in cell cycle regulation. In tumors, proteolytic cleavage of full-length cyclin E produces low molecular weight isoforms (LMW-E) that are in themselves tumorigenic. Dr. Keyomarsi and colleagues have demonstrated that the function of HER2 and cyclin E are interlinked. Furthermore, tumors that overexpress both HER2 and cyclin E, and in particular LMW-E, have a more aggressive phenotype. *More recently, their studies have demonstrated that screening for both LMW-E and HER2 has a prognostic and predictive role for breast cancer therapy, and, in particular, are proposed to be predictive of those patients that will respond favorably to trastuzumab in combination with other therapies.*

Low molecular weight Cyclin E (LMW-E) is tumorigenic and is a prognostic and predictive marker for responding to HER2 targeted therapy in breast cancer patients as well as a target for tumor therapy.

- High levels of HER2 and LMW-E in breast tumors are an indicator of a highly aggressive form of breast cancer.
- Patients that are HER2+ and LMW-E+ should respond better to a combination therapeutic regime of both trastuzumab and Cdk-2 or elastase inhibitor such as Roscovitine.
- Patients that are HER2+ and LMW-E- are expected to respond well to trastuzumab alone or in combination with other chemotherapeutics.
- Furthermore, screening for levels of LMW-E during treatment may provide a good indicator of the effectiveness of treatment.
- Due to LMW-E cytoplasmic location, it is easy to detect and quantify amounts of LMW-E.

US 61/159331 SUBCELLULAR LOCALIZATION OF TRUNCATED CYCLIN E AND USES THEREOF

Our US application (filed 03/11/2009) covers methods and kits for treating breast cancer and for identifying individuals likely to respond to a particular cancer treatment regimen such as trastuzumab therapy. More specifically, the invention concerns the detection of low molecular weight isoforms of Cyclin E (LMW-E) and/or cytoplasmic accumulation in cancer cells as a predictive and prognostic tool in cancer treatment.

Clayton Biotechnologies, Inc. wishes to license this patent portfolio. For more information, please contact our business development unit:

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