

MammOmix: Gene signature for the identification of lymph node involvement in cancer patients

Overview

The axillary lymph nodes are often the first sites of metastatic spread before invasion into other organs. Therefore, lymph node status is an important indicator of cancer spread and crucial for the staging of breast cancer. Currently, imaging and physical examination alone is not sufficient to rule out the possibility of nodal involvement for cancer staging. Despite advancements in molecular diagnostics, there remains no clinically relevant molecular biomarker capable of indicating whether cancer has spread or is likely to spread to Lymph nodes.

Technology

Researchers at the University of Limerick have identified a gene signature to discriminate between lymph node-positive (LN+) and lymph node-negative (LN-) breast cancer patients. The current method has been tested and validated using patient tissue samples and can be performed on a patient's initial core biopsy. This signature, optionally in conjunction with current methods of lymph node examination, could aid in the swift identification of lymph node-positive / negative breast cancer patients.

Benefits

The axillary lymph nodes are often the first sites of metastatic spread before invasion into other organs. There exists a current lack of prospective molecular tools for the earlier identification of lymph node involvement. The University of Limerick has identified two genes ITGB4 and SNAI2 which in preliminary data correctly classified lymph node status for 73% of patient samples. This work has the potential to identify women who have lymph node-positive cancer at an earlier phase in the cancer journey when compared to current methods and change the care plan.

Preoperatively identifying lymph node involvement, allows for more accurate identification of patients who require lymph node sampling or dissection, reducing the potential side effects associated with these procedures. This also unlocks the prospect of more accurately identifying those who would benefit from neoadjuvant therapy, namely neoadjuvant radiotherapy to the axilla, in a bid to prevent further cancer cell migration.

Applications

To our knowledge, this is the first collective use of patient grade and genes ITGB4 and SNAI2 for the classification of lymph node status in breast cancer patients. It provides a clinically relevant diagnostic test with the potential for commercialisation.

Commercial Opportunity

The University of Limerick is seeking partners to exploit the commercial potential of these technologies by entering into licensing agreements.

Target Market for Innovation: Molecular Biology

Development partner

Commercial partner

Licensing

University spin-out

Seeking investment

Patent Title: Gene signature for the identification of lymph node involvement in cancer patients.

Type: Parent Provisional

Country: EPO

Status: Filed

Priority Date: 30-Jun-2021

Application number: EP21182896.7

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Figures

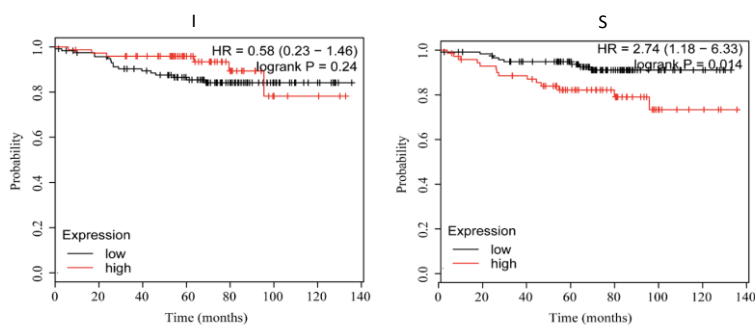


Figure 1: Fig 1 illustrates Kaplan-Meier plots showing distant metastasis free survival for low and high mRNA expression of I and S (n=191). Included were all ER+ and PR+ patients with a combination of HER+/-.

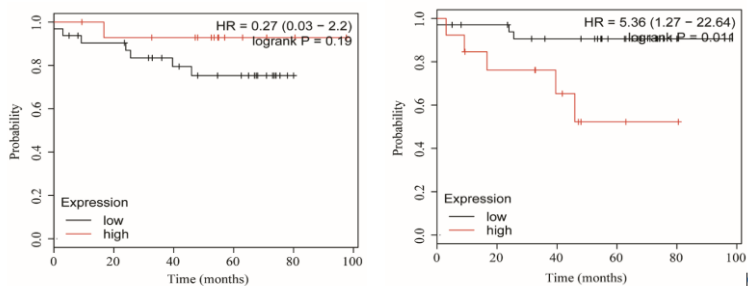


Figure 2: Fig 2 illustrates Kaplan-Meier plots showing distant metastasis free survival for low and high mRNA expression of I and S (n=47). Included were all ER+ and PR+ and HER+ patients