

Characterization of pre-clinical models of luminal B breast cancer in orthotopic and bone metastasis settings

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Luminal B breast cancer is a hormone receptor (ER and/or PR) positive and HER2 positive or negative carcinoma with high proliferation rate and poor prognosis. Luminal B breast cancer has increased risk to relapse in incurable bone metastasis. Scarce availability of pre-clinical luminal B type of breast cancer bone metastasis models sets a challenge for development of more efficient treatments for luminal B breast cancer where therapeutic resistance is common.

Aim of this study was to verify and compare the ER, PR and HER2 status in luminal B type orthotopic and bone metastasis xenograft models. BT-474 (ER+, PR+, HER2+) human breast ductal carcinoma cells were inoculated into the mammary fat pad or tibia bone marrow of female immunodeficient CIEA NOG mice, presenting orthotopic and bone metastasis models, respectively. The orthotopic study was performed with and without estradiol (E2) supplement and the bone metastasis study without E2 supplement. Tumor growth was followed for 8 weeks and histopathological evaluation and ER, PR and HER2 immunoperoxidase stainings were performed at endpoint.

The orthotopic tumors with E2 supplement expressed ER, PR and HER2. Without E2 supplement the tumors in the orthotopic and bone metastasis studies were ER and HER2 positive but PR negative. Orthotopic tumors without E2 grew only to 38% of the animals, whereas 100% take rate was observed with E2 supplement and in the bone metastasis study.

This study highlights the importance of careful characterization of pre-clinical models when developing new cancer therapies. Focus should be addressed not only to primary tumors but also to bone metastases. The characterized orthotopic and bone metastasis models can be used to study new treatments for luminal B breast cancer, e.g. targeting the IGF-1 or FGF signaling pathways that are known to affect treatment resistance and cell proliferation.

Biography

Anniina Luostarinen has graduated as biomedical sciences major from University of Turku in 2016. Before and after upgrading her education from biomedical laboratory scientist, graduaded in 2006, she has worked in Pharmatest Services, a preclinical contract research organization, concentrating in development of cancer and skeletal disease treatments. Her whole career has focused on the physiology of bone and the interaction of bone microenvironment and cancer. Particularly the bone histology as well as radiology are in her interest.

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