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Novel breast cancer subtypes identified using multiplex biomarker panel assays

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Biomarker panels are increasingly being employed to subtype tumors into therapeutic groups. This is exemplified by the oestrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) molecular classifications in breast cancer. Understanding deregulated cellular mechanisms in tumors uncovers new targets for therapy, and provides biomarkers as classifiers of novel subtypes. Our study aims to optimize a diagnostic assay for accurate and rapid analysis of the receptor status of breast cancer using RNA derived from formalin fixed paraffin embedded (FFPE) material using small amounts of material from archival tissues and to identify tumors eligible for PP2A activation therapy. A set of 40 genes were selected to classify breast cancer patients. QuantiGene multiplex assay (Affymetrix) was used to quantify the targets of interest using the Luminex platform. 11 breast cancer cell lines were used for validation of the assay. Archival FFPE tissues were obtained and laser micro-dissection isolated histological diverse tumor sections along with matched normal tissue. Our results show that degraded RNA can be used from archival material to quantify receptor status of breast cancer tissue. PP2A deregulation was predominantly driven by CIP2A overexpression in triple negative (ER, PR and HER2 negative) and in HER2 positive breast tumors. A novel TNBC subtype characterized by PP2A deregulation was identified. Of interest, PP2A activity biomarker expression correlated with sensitivity to the pp2a activator, FTY720, potentially predicting tumors that can benefit from this therapy.

Biography

Godfrey Grech is an Associate Professor at the University of Malta and currently responsible for the National Breast Cancer Research Project. He has published more than 25 peer-reviewed publications, presented more than 50 conference papers and published 3 book chapters as Co-Editor of the published book entitled "*Preventive and Predictive Genetics, Towards Personalized Medicine*" released by Springer.

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