DEVELOPMENT OF CIRCULATING BIOMARKERS FOR EARLY AND ADVANCED BREAST CANCER

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Early work uncovered HCG1745306 isoform CRA-a, and histone H1.2 as potential specific plasma biomarkers for the identification of patients with early ER[+] (estrogen receptor-positive) breast cancer. However, while these markers were absent in controls, the results were obtained from only two patients and therefore require verification in a larger patient cohort. Moreover, in another preliminary study, we identified potential extracellular vesicles (EV) factors which might serve as biomarkers for predictive and diagnostic purposes in metastatic breast cancer. Plasma samples from seven different metastatic and non-metastatic ER[+] breast cancer patients were collected, EV were isolated and their protein content analyzed by mass spectrometry and FunRich analysis. In this study, we found several putative plasma EV biomarkers for metastatic ER[+] breast cancer prediction and diagnosis, such as serum amyloid A1, known to promote widespread metastasis in a breast cancer animal model. In conjunction with academic and clinical colleagues from the Department of Biomedical Sciences at the University of Hull and Castle Hill Hospital, we propose to examine the pathophysiological role of the proteins found in the original works using tissue samples from patients with a confirmed diagnosis of breast cancer compared to adjacent benign breast tissues. If the initial results are confirmed, we will determine if these markers can be identified in whole blood samples from a larger cohort of patients with breast cancer. These projects have the potential to identify blood biomarkers for early breast cancer improving the specificity of mammography, allowing patients to be selected for auxiliary imaging based on the presence of specific biomarkers in the blood and to identify with certainty which early precursor lesions will progress to malignancy. Also, they have the potential to be used to identify both early breast cancer and whether the disease has metastasized to other sites. If confirmed in a large patient cohort, the biomarkers could be isolated and incorporated into a non-invasive test such as a lateral flow device that could be used for the detection of patients with early and metastatic breast cancer and to identify the sites to which the cancer has metastasized. This would help clinicians decide which patients will benefit of adjuvant therapy. If the original findings cannot be replicated, we will search for suitable biomarkers in urine or saliva samples or plasma samples using 2D gel electrophoresis and the scioDiscover platform.

Biography

Ana Pedro working as Pharmacist in Rowland's Pharmacy, she works in the development of test kits for circulating biomarkers for early and advanced breast cancer to be commercialized in community pharmacies. Also undertaken community clinical pharmacy research work and looking forward to develop PGDs and educational materials to pharmacists and bring overseas pharmacists to work in UK.

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