Project: Understanding response to pre-operative therapy that's given to reduce hormone receptor positive breast cancer

Research team: A/Prof Prudence Francis, Prof Sherene Loi, Prof Sarah-Jane Dawson

Institution: University of Melbourne

Cancer type: Breast

Years funded: 2021-2023

What is the project?
We want to understand how tumour genes respond to breast cancer treatment. We will use breast tumour and ‘liquid biopsies’ (a blood test to study circulating tumour DNA) from women with hormone-receptor positive breast cancer undergoing chemotherapy, prior to surgery. Using pre-treatment, on-treatment and post-treatment tumour biopsies, as well as liquid biopsies, we aim to identify which patients will get the greatest benefit from drug treatment prior to surgery and identify tumour gene markers that predict this response.

What is the need?
Our goal is to personalise treatment for women with breast cancer in the future. We will identify gene markers present in breast cancer that predict if the cancer will respond to chemotherapy with and without endocrine therapy, prior to surgery. This research aims to develop new strategies to individualise breast cancer treatment, in order to maximise the benefit of therapy.

What are you trying to achieve?
This research project will contribute to understanding the biology of large hormone receptor-positive HER2-negative breast cancers, and identify those cancers that will respond well to pre-operative drug therapy. For cancers less likely to respond, we aim to identify novel molecular targets for treatment that could potentially improve outcomes.

How important is this funding?
Funding to support this clinical trial translational research is pivotal to maximize the knowledge gained from the trial and from the tumour biopsies and blood samples generously provided by the participants for research purposes.

Project timeline

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<th>Timeline</th>
<th>2021</th>
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<td>Complete circulating tumour DNA extraction and sequencing from plasma samples</td>
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<td>Complete tissue whole exome sequencing; analysis of genomic profile and clinical-pathologic outcomes; RNA sequencing of tumour tissue</td>
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<td>Complete analysis of RNA sequencing, tumour pathology and treatment response; identify targetable genomic alterations</td>
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"Cancer research is my way of honouring patients that we could not cure and their loved ones, by continually striving to learn and discover new and better ways to treat cancer, so that future patients affected by cancer will experience better outcomes."

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