Cancer Council Western Australia
PhD Top Up Scholarship

Cancer Council WA

Project title	Designing new materials that deliver gene therapies to breast cancer
Recipient	Ms Jessica Kretzmann
Institution	The University of Western Australia
Research description	Breast cancer is the 2nd most common cause of cancer death in women and the 4th most common cause of cancer death in Australia. It is not a single disease: 10-17% of breast cancers are an aggressive type called Triple Negative Breast Cancers, which have no targeted therapies, a higher recurrence rate and shorter overall survival. Targeted therapies are available for more common types of breast cancers, however resistance to therapy occurs in a large number of patients. Thus, there is an urgent need to develop new targeted treatments to reduce disease burden and mortality. Like most diseases, cancer is affected by our genetics. Women with abnormalities in particular regions of their genetic code are at increased risk of developing aggressive breast cancers, with few treatment options available. Genetic testing is available, and women carrying these abnormalities may undergo preventative measures such as complete removal of both breasts, but there are no non-invasive treatments for these women. Thus development of therapies that aim to correct these genetic abnormalities can have a huge, positive impact on the prevention and treatment of breast cancer. Unfortunately, therapies that correct genetic abnormalities are not yet available, as there are no safe and efficient methods to deliver these therapies. This project aims to design, produce, and test new, highly effective and safe materials that can deliver genetic therapies to cancer cells which will involve: computer modelling, to assist in the design of suitable materials; chemical synthesis, to make the materials; and cell- and animal-based experiments, to test whether these new materials are effective in reducing the risk of cancer. By combining these approaches the research will develop crucial understanding in the targeted delivery of genetic therapies, and use novel delivery agents to transfer genetic therapies to cancer cells and edit faulty genes that lead to breast cancer.
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