Cancer Council Victoria

Research We Fund

Project:

Predicting radiation therapy failure in newly diagnosed prostate cancer patients

Research team:

Dr Simon Keam

Institution: Peter MacCallum Cancer Centre

Cancer type: Prostate

Years funded: 2019–2021

What is the project?

We want to develop a diagnostic strategy that predicts whether patients receiving radiation are at risk of becoming resistant and likely to develop aggressive disease. To achieve this, we will explore a remarkable collection of one-of-a-kind human tissues collected from more than 70 prostate cancer patients. These samples will reveal small variations between patients and how these discriminate between good and poor responses. We want to use this database to forecast a poor response and generate a catalogue of potential molecules that are linked to resistance. This will provide clinicians with a powerful tool to predict patient responses and ensure the best outcome is achieved when radiation is being used.

What is the need?

The development of resistance is observed in up to a third of prostate cancer patients receiving radiation. Unfortunately, many of these patients go on to develop advanced disease requiring more aggressive treatments such as chemotherapy, hormone therapies and surgical removal of the prostate. There is a clear need to predict patients that will develop resistance and identifying what drives this resistance may also lead to the development of new treatments.

What are you trying to achieve?

We want to minimise the problem of radiation resistance in prostate cancer patients by providing a signature that predicts a poor response. This will make overall treatment successes higher and reduce the pain and suffering associated with aggressive disease that frequently results from treatment failure.

Project timeline

Timeline	2019	2020	2021
Collect and begin processing half the tissue for analysis. Data from these experiments, most of which will be analysed at highly specialised genomic and proteomic centres, will start to be combined into a large database.			
Complete the remainder of the main tissue samples and begin analysis of tissue from patients who have had tumours return after seemingly successful radiation therapies.			
We will test a final small cohort of patients to identify molecular changes associated with radiation dose responses. Our subsequent studies will be focused on exploring new therapies.			

> “There is a clear need to predict patients that will develop resistance and identifying what drives this resistance may also lead to the development of new treatments.”