Cancer Council Victoria

Research We Fund

Project:

How does the DNA damage that accumulates with age influence cancer risk?

Research team:

Dr Ian Majewski and Dr Peter Valk

Institution: The Walter and Eliza Hall Institute of Medical Research

Cancer type: Leukaemia and colorectal cancers/All cancers

Years funded: 2020-2022

What is the project?

Cancer results from the accumulation of mistakes in our genetic code. These build up over time, which is why cancer becomes more common with ageing. By exploring ways to speed up the DNA damage process, our group is studying how this damage alters the behaviour of cells and how this leads to cancer. We will develop new models and sensitive tools to monitor the emergence of cancer that may help as screening methods to catch the disease at an early stage.

What is the need?

Understanding how DNA damage predisposes to cancer may help to develop more early screening methods for cancer. Rather than waiting for DNA damage to accumulate naturally we will employ novel approaches to speed up this process. This should allow us to study complex biological processes that would normally unfold over decades. This project will study how much of ageing's physiological changes are a direct result of DNA damage and help to reveal whether fine-tuning DNA repair pathways could slow the ageing process or lessen the risk of cancer.

What are you trying to achieve?

We will deliver new models in which the rate of DNA damage is accelerated, and plan to emulate the natural levels of damage that occur over a human lifespan. We will also address how age-related DNA damage modifies cells and tissues and use these systems to investigate chemical or genetic approaches to slow ageing and cancer development.

Project timeline

Timeline	2020	2021	2022
Develop systems to stimulate DNA damage to model DNA changes as we age			
Verify our models, confirming we are stimulating DNA damage in the right cells and levels			
Study the health impact of high levels of DNA damage and perform detailed survey to detect early signs of cancer			

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