



Research We Fund



Project:

Diagnostic imaging and therapy of cancers with copper radiopharmaceuticals

Research team:

Professor Paul Donnelly,
A/Prof Carleen Cullinane

Institution: University of Melbourne

Cancer type: Prostate, breast and lung

Years funded: 2020–2022

What is the project?

Radionuclide therapy is particularly useful in metastatic and disseminated diseases, and when conventional treatments are no longer effective. This research will use matched radionuclides, with copper-64 guiding the therapeutic agent copper-67 against peptide receptors in tumours often found in prostate, breast, lung and gastrointestinal cancers. Significantly this will use a copper-binding molecule to form a more stable bond. We aim to design new therapeutic agents and conduct preclinical evaluation to bring these therapies to clinical trials.

What is the need?

Localised prostate cancer has good five-year survival, but metastatic disease has poorer outcomes. The copper-64/67 pair enables the use of different isotopes of the same element to prepare companion diagnostics

to guide the use of therapeutic agents, which can better target cancer. This research will develop new agents using the same element, copper, for both diagnostic imaging and targeted therapy. This could prove superior to current protocols and open the possibility of treating several different cancers that over-express the peptide receptor GRPr or antigen PSMA.

What are you trying to achieve?

We aim to contribute to improved treatment of cancer through developing chemistry to enable personalised medicine in which diagnostic imaging guides therapeutic treatment protocols using the same element (copper).

Project timeline

Timeline	2020	2021	2022
Conduct synthetic chemistry to produce new bonding molecules; develop procedures for 'labelling' copper; assess stability of tracers and formulation studies	■		
Further chemical synthesis and assess radiochemical stability in serum and resistance to radiolysis; conduct PET imaging studies		■	
Developing radiochemistry protocols and further radiochemical stability assessment; conduct in vivo therapeutic study; compare new agents to select lead candidates for translation into the clinic and prepare manuscripts for publication			■

“This research will develop new agents which could improve the treatment of several different cancers.”