Background

Associate Professor Michele Teng and her team have identified a novel target for the treatment of cancer. Mucosal associated invariant T cells (MAIT cells) are a subset of unconventional T cells that require MHC class I–related protein 1 (MR1) for their development and function. MAIT cells have been reported to have either protective or pathogenic roles in bacterial and fungal infection; however, their role in antitumor immunity has not been fully elucidated.

Technology

Associate Professor Michele Teng has identified a new mechanism for MAIT cells in promoting tumour growth. Contradicting the perception that MAIT cells kill tumour cells. Associate Professor Teng and her team showed that MAIT cells promoted tumour initiation, growth, and metastasis. MR1-expressing tumour cells activated MAIT cells to reduce NK-cell effector function, partly in a host IL17A–dependent manner.

MR1-blocking antibodies reduced tumour metastases and growth, and may represent a new class of cancer therapeutics.

Through this work, she has identified a promising novel target, MHC class I-like protein (MR-1) that, when blocked, prevents activation of MAIT cells to mediate immunosuppression which results in enhanced anti-tumour immunity.

Compelling preclinical data demonstrates that:
1. Many tumors are able to upregulate expression of MR1 and potentially can activate MAIT cells to mediate immunosuppression of effector T and NK cells
2. Blocking antibodies to MR1 suppress tumour growth and metastasis in preclinical animal models including in a tumor model that is resistant to PD1 blockade. Knockout studies of MR1 in mice and in cell lines support these findings.

This work examines methods of use to control tumour growth via promotion of effector immune cells to the target site.
Applications

This discovery has potential applications in the treatment of cancer (immuno-oncology with high translational potential) and inflammatory diseases and represents a novel target and regulatory axis.

Intellectual Property

A Provisional patent application (2019901742) was filed 22nd May 2019.

Partnering Opportunity

- IP Strategy is defined
- Targeting Proof of Concept in vivo models
- Seeking collaborative partners to develop therapeutics
- Collaborative Research Agreement + Option to license
- Co-Development program

Lead Researcher

Associate Professor Michele Teng is head of the Cancer Immunoregulation and Immunotherapy Laboratory at the QIMR Berghofer Medical Research Institute in Brisbane, Australia. Over her career, she has published 97 peer-reviewed primary papers and reviews (7952 citations, Google Scholar; H-index, 46) in high impact journals such as Cancer Discovery, Cancer Research, Nature Medicine, Nature Reviews Clinical Oncology and Lancet Oncology. Her group is investigating how tumour-induced immune suppression impedes th In addition, her group is determining how scheduling of immunotherapies can further improve their antitumour efficacy and have developed a preclinical mouse model to assess how different combination therapies impact on tumour immunity and immune related adverse events.

With more than 900 scientists, students and support staff, QIMR Berghofer is one of Australia’s largest and most successful independent medical research institutes. The QIMR Berghofer Business Development Team manages over 160 patent families, offering a wealth of collaborative and commercial opportunities for industry and government. We have a strong track record of partnering with leading pharmaceutical and biotech companies to further develop early-stage technologies, generating over $21 million in annual commercial revenue in the last financial year. In addition to licensing and partnering outcomes, we facilitate contract research and consulting projects for industry clients. Our team includes specialists in commercialisation, IP protection, patent law, clinical trial and project management and industry-backed grant opportunities.