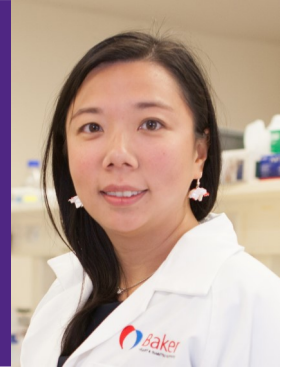


Thursday, February 4th, 2021 at 5pm

Xiaowei Wang PhD

Associate Professor Wang heads the Molecular Imaging and Theranostics laboratory at the Baker Heart and Diabetes Institute, Melbourne, Australia

Title: Targeting Activated Platelets for Molecular Imaging, Drug Delivery and Theranostics: Cardiovascular and Malignant Diseases



Abstract:

Platelets play a significant role in both cardiovascular disease and cancer. Glycoprotein (GP) IIb/IIIa is the most abundant platelet surface receptor, responsible for adhesion and aggregation. We have developed a conformation-specific single-chain antibodies (scFv) binding specifically to activated GPIIb/IIIa on platelets.

By conjugating the scFv with the appropriate contrast agents, we have shown in vivo imaging of thrombosis and myocardial infarction across several imaging platforms: 1) microbubbles for ultrasound, 2) near-infrared dyes for fluorescence imaging, 3) iron oxides for MRI and 4) radiotracers for PET/CT. After the administration of clinical used fibrinolytic drugs, we directly visualized the thrombus size reduction. More recently, we have shown that specific targeting of our scFv within the tumour microenvironment using PET/CT, optical and ultrasound imaging. Activated platelets are ideal targets for molecular imaging of atherothrombosis and cancer.

Bleeding complications hamper current pharmaceuticals treatment for thrombosis. By genetically engineering our scFv with anti-coagulant or anti-thrombotic drugs, we have achieved side-effects free targeted delivery of these agents to blood clots in vivo. Using a low systemic dose of these fusion constructs, we have demonstrated the prevention of thrombosis and the preservation of heart function post-infarction, without an increase in bleeding.

Building on these diagnostic and therapeutic approaches to attain a novel theranostics strategy, we have shown the successful thrombolysis in vivo using an acute thrombosis model. Overall, the targeting of activated platelets provides an opportunity to diagnose and treat a range of cancer and cardiovascular diseases.

Associate Professor **Xiaowei Wang** is the Lab Head of the Molecular Imaging and Theranostics Lab and co-leads the Atherothrombosis Program at the Baker Heart and Diabetes Institute, Melbourne. Her work in molecular imaging includes ultrasound, MRI, nuclear and optical imaging to diagnose cardiovascular and malignant diseases. A/Prof Wang also works on genetic-fusion of antibody-to-drug for site-specific therapy and the creation of nanoparticles for theranostic approaches. Her work has been published in high impact factor journals such as *Circulation*, *Blood*, *Circulation Research* and *European Heart Journal*. Currently, A/Prof Wang is on the Leadership Committee of Women in Molecular Imaging Network, the President of the Australian Society of Molecular Imaging and the President-Elect of the Federation of Asian Societies Molecular Imaging. A/Prof Wang acts as a supervisor and mentor to several junior scientists. She also engages with the broader community to deliver educational content and is the co-founder of a non-for-profit makerspace.