Victor Chang Cardiac Research Institute

Understanding the role of PHACTR1 in atherosclerosis

Vascular Biology, Kovacic Lab

PHACTR1 in atherosclerosis

Phosphatase And Actin Regulator 1 (PHACTR1) is one of the most important genes in vascular disease.

Coronary artery disease (CAD) is the leading global cause of morbidity and mortality. Among the many single nucleotide polymorphisms (SNPs) that are associated with CAD, rs9349379, which resides in the gene encoding PHACTR1, is of particular importance. **However, the mechanisms by which PHACTR1 governs CAD and other vascular diseases is unknown.**

To date, PHACTR1 has been shown to bind to both actin and Protein Phosphatase 1, however, these interactions do not fully explain its role in the progression of arterial disease.

There is an acute need for novel molecular and genetic insights about CAD and other vascular disorders. By leveraging our unique resources, we hope to uncover the role of PHACTR1 in CAD.

Studying at VCCRI

VCRRI is one of the most respected heart research facilities in the world.

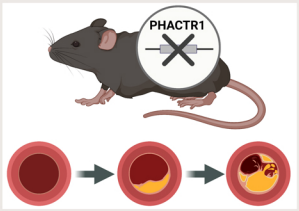
We are committed to attracting, mentoring, developing and investing in the future of the best students with world leaders in their field as mentors.

As a student you will benefit from:

- State of the art lab equipment, including the VCCRI Innovation Center
- Wide variety of internal and external seminar speakers
- Regular lab meetings to discuss project progression
- Being part of the St Vincent's Research Precinct (VCCRI, Garvan Institute, Kinghorn Cancer Centre & AMR)
- Central Sydney location close to Kings Cross

Our Projects

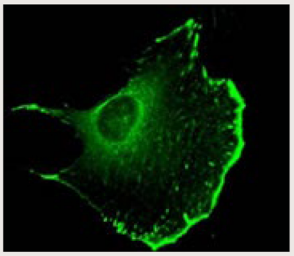
Role of PHACTR1 in the development and progression of atherosclerosis



Skills involved:

- Small animal handling
- Phenotype characterization
- Histology, Physiology, MRI,
- Single cell gene expression and spatial transcriptomics

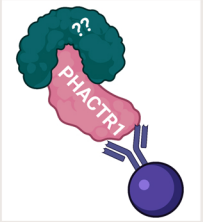
Role of nuclear-cytoplasmic shuttling of PHACTR1



Skills involved:

- Confocal microscopy
- Live cell imaging
- Molecular biology
- Mutagenesis and cloning
- Cell culture
- qPCR, RNA sequencing

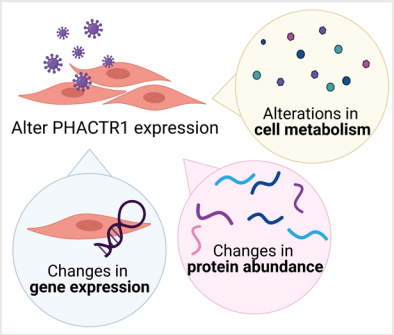
Identification of novel PHACTR1 binding partners



Skills involved:

- Co-immunoprecipitation of proteins
- Molecular biology
- Mass spectrometry
- qPCR & Western blotting
- Cell culture

Harnessing multi-omics to understand PHACTR1



Skills involved:

- Mass spectrometry
- Genomics
- Bioinformatics
- Cell tissue culture

VICTOR CHANG CARDIAC RESEARCH INSTITUTE INNOVATION CENTRE

Kovacic lab members

Prof Jason Kovacic

Executive Director of the VCCRI
Robert M Graham Chair and Professor of Medicine, UNSW

Jason Kovacic took over as Executive Director of VCCRI in 2020 and heads the Vascular Biology Lab. He is also a practicing clinical cardiologist at St Vincent's, specializing in vascular disease and blockages of the heart arteries.

J.Kovacic@victorchang.edu.au

Dr Nicole Bryce

Senior Staff Scientist, VCCRI
Conjoint Senior Lecturer, SoMS, UNSW
N.Bryce@victorchang.edu.au

Dr Kathryn Wolhuter

Postdoctoral Scientist, VCCRI
Conjoint Lecturer, SoMS, UNSW
K.Wolhuter@victorchang.edu.au

Darren Newington

Senior Research Assistant