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.

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

Studying at VCCRI

VCRI 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 VCRI 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 (VCRI, Garvan Institute, Kinghorn Cancer Centre & AMR)
- Central Sydney location close to Kings Cross

Kovacic lab members

**Prof Jason Kovacic**

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

Jason Kovacic took over as Executive Director of VCRI 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.

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