



International Ottawa Heart Conference 2017

**Myocardin regulates mitochondrial permeability transition
and cell death during cardiac development
and heart failure.**

Wajihah Mughal, PhD Candidate

Supervised by Dr. Joseph Gordon

Dept of Human Anatomy and Cell Science

University of Manitoba

March 31st, 2017



UNIVERSITY
OF MANITOBA

Faculty of Health Sciences

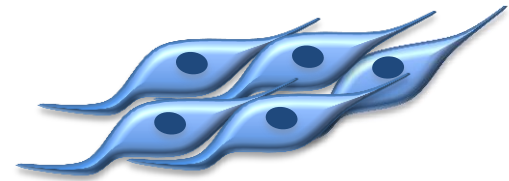
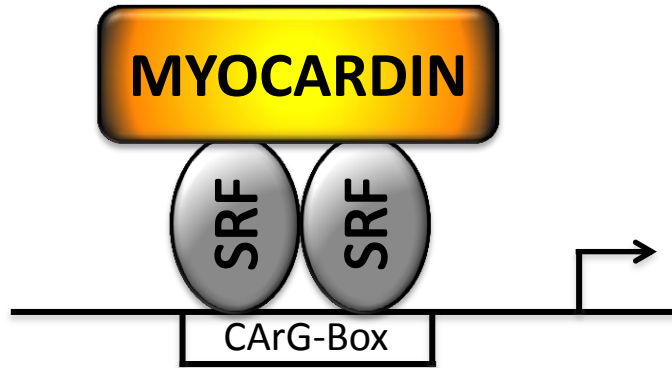


International Ottawa Heart Conference 2017

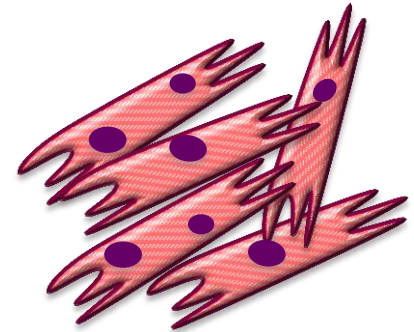
Disclosure of conflict interest:

Nothing to declare for this study

Powerful transcriptional co-activator



Smooth Muscle Cells

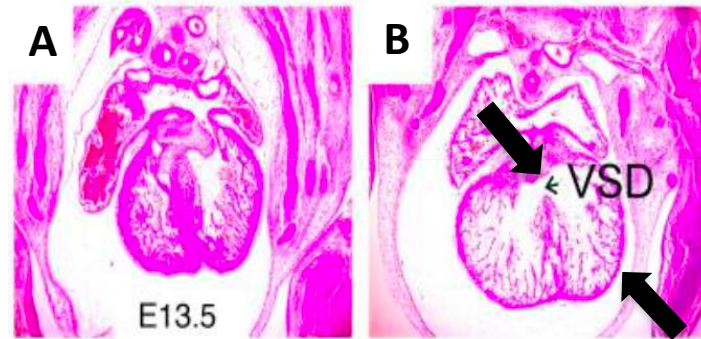


Cardiomyocytes

Required for embryonic development

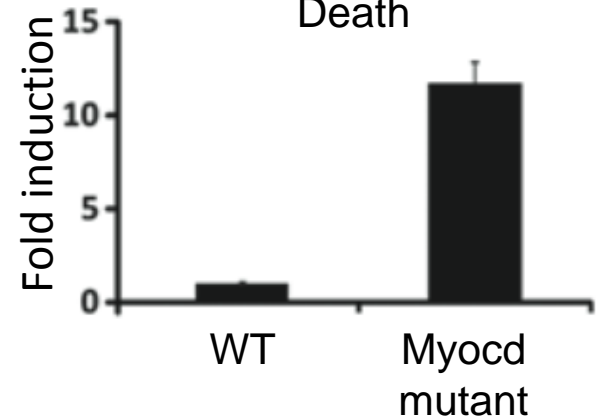
WT

Myocd-mutant:
Cardiac cells



B: Ventricle Septal Defect (VSD) & Hypoplastic Ventricles

Programmed Cell Death



Introduction

Hypothesis

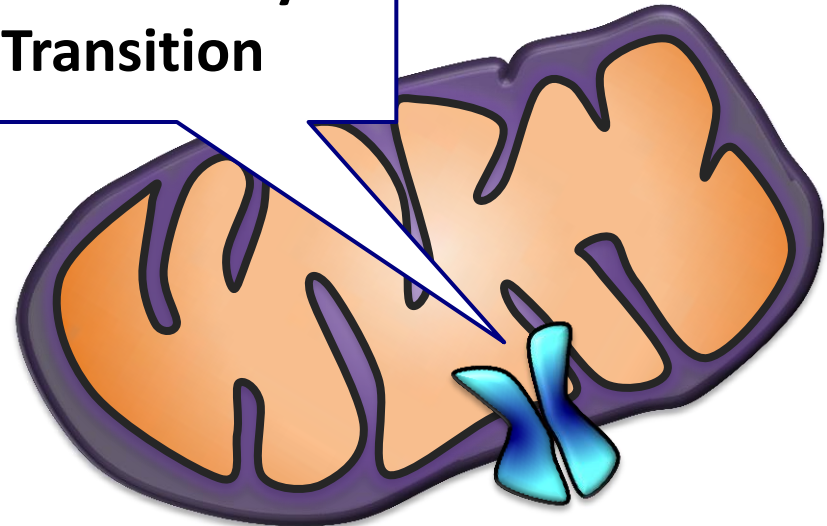
Results

Future Directions

Impact on Health

Generate ATP
Cardiomyocyte function

**Permeability
Transition**



Mitochondria

Introduction

Hypothesis

Results

Future Directions

Impact on
Health

Introduction

Hypothesis

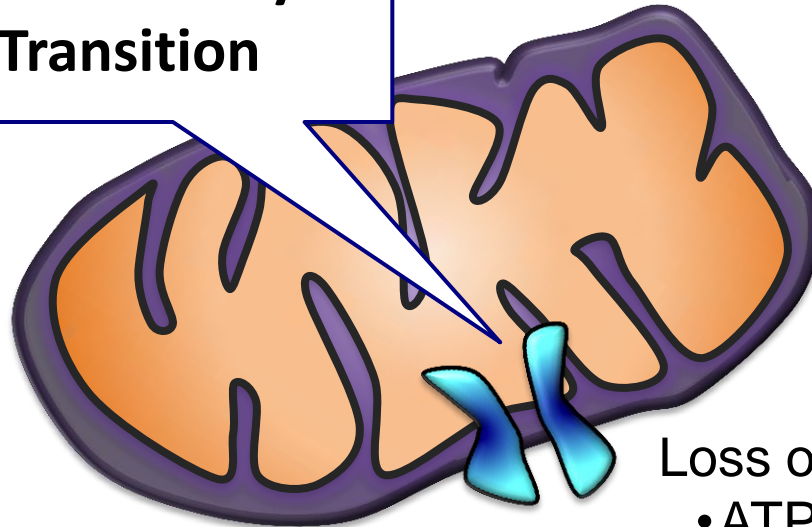
Results

Future Directions

Impact on
Health

Generate ATP
Cardiomyocyte function

**Permeability
Transition**



Mitochondria

Loss of:

- ATP production
- Respiration

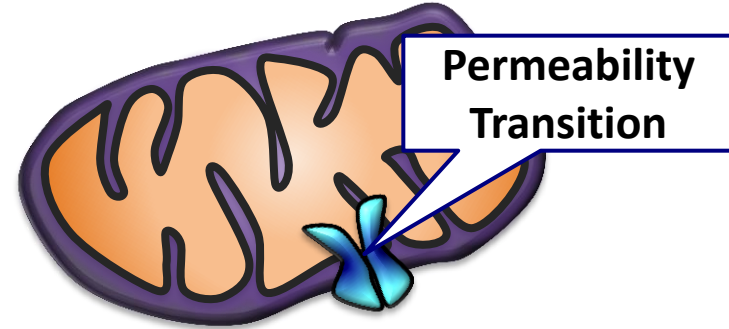
Cardiometabolic dysfxn



**Mito-permeability
transition-regulated necrosis**

Introduction

MYOCARDIN



Hypothesis

Myocardin regulates mitochondrial permeability transition and cell death during development and heart failure

Results

Microscope Fluorescent Imaging

Future Directions

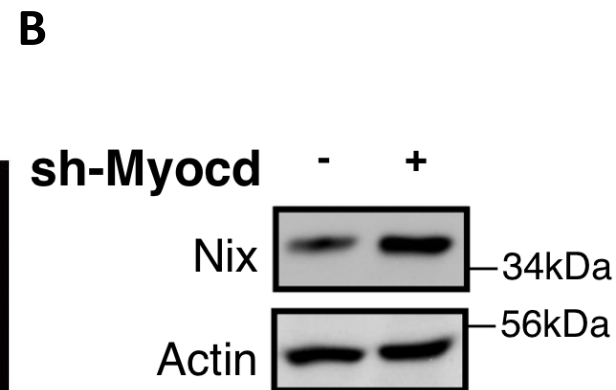
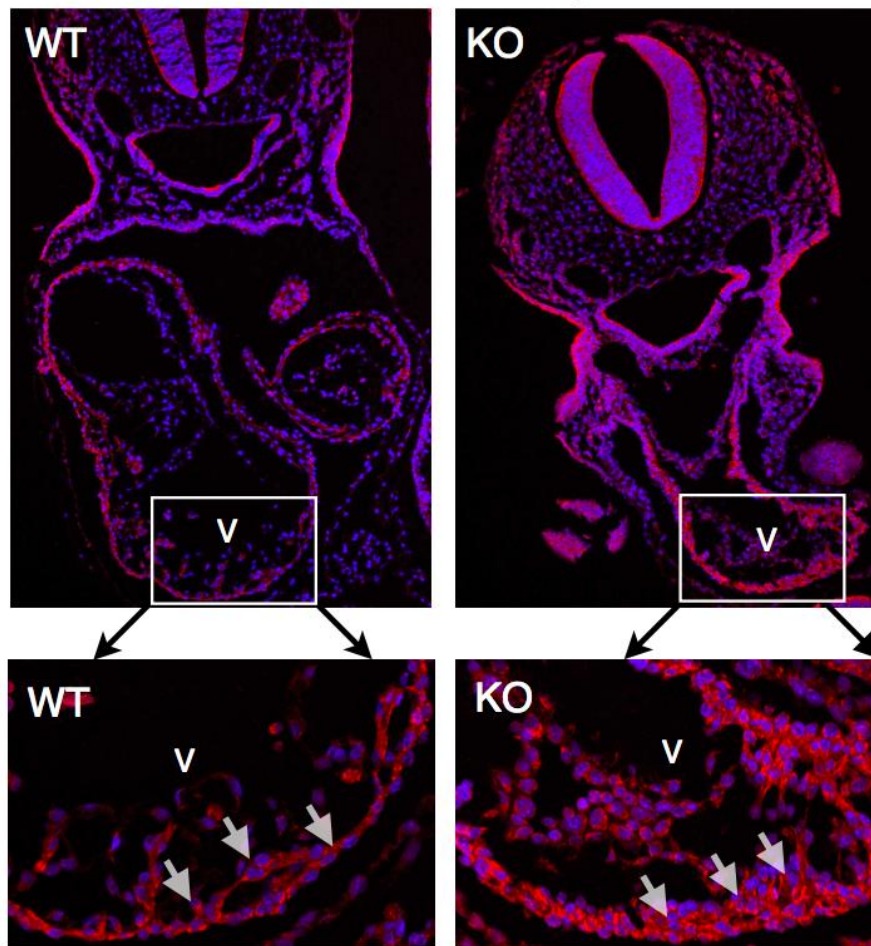
Biochemical Assays

Impact on Health



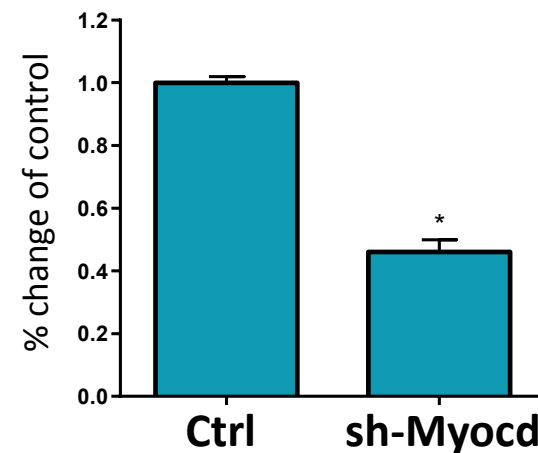


A Myocardin^{-/-} Mouse Embryos Nix



Mechanism?

miR-133a Expression



Introduction

Hypothesis

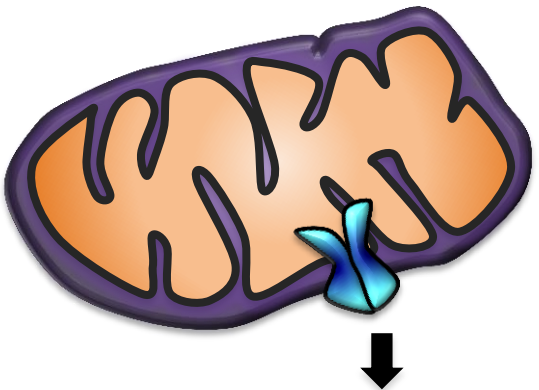
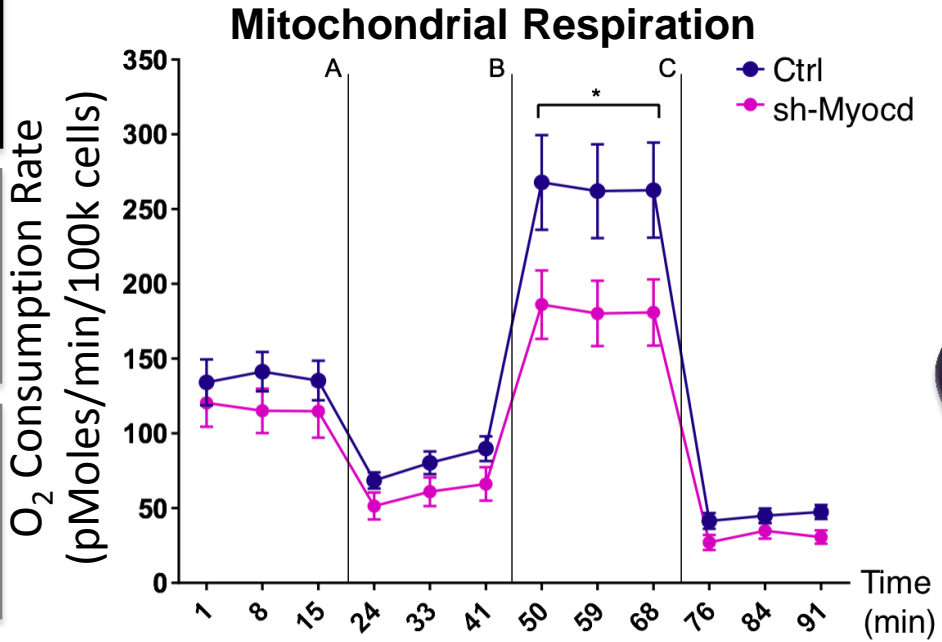
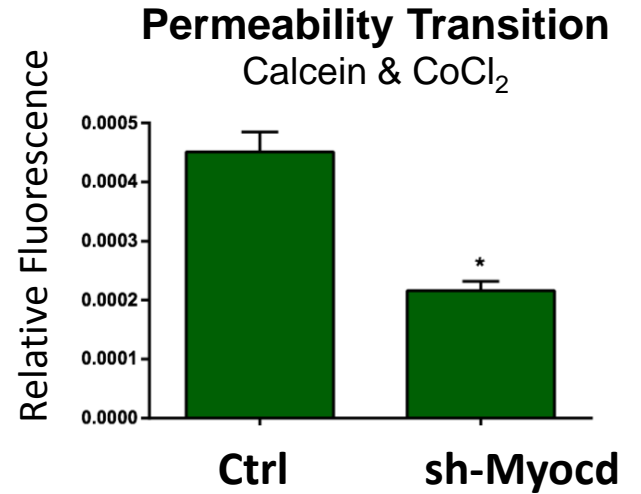
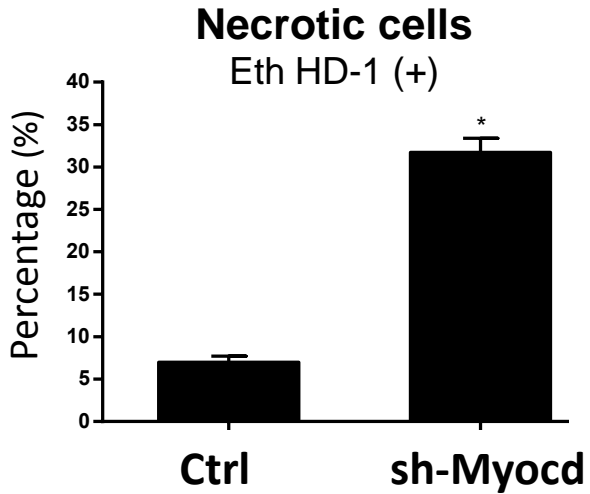
Results

Future Directions

Impact on Health



- Introduction
- Hypothesis
- Results**
- Future Directions
- Impact on Health



↓
Cardiac Cell Survival

Rodent model of myocardial infarction: infarct border zone

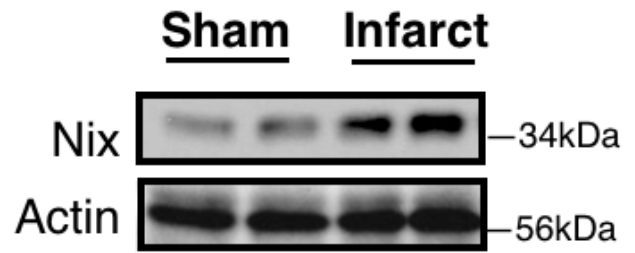
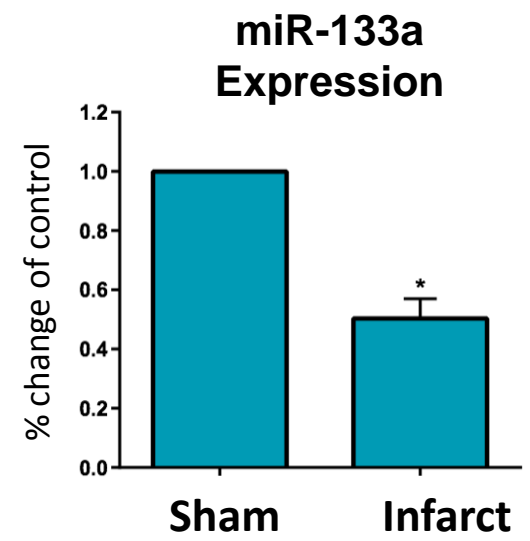
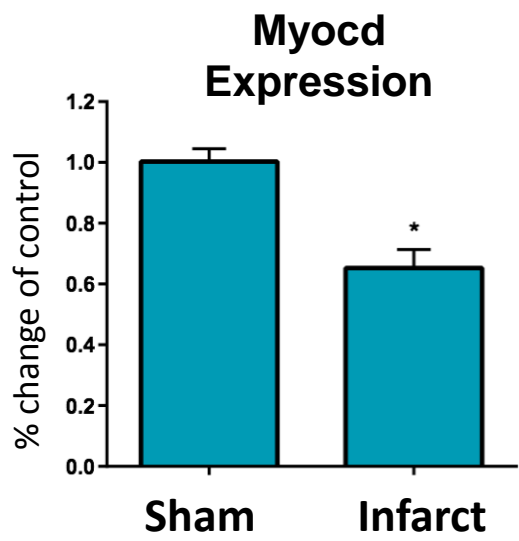
Introduction

Hypothesis

Results

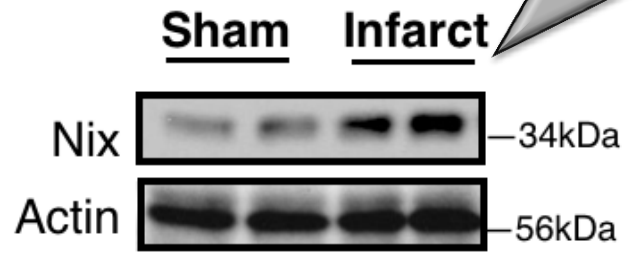
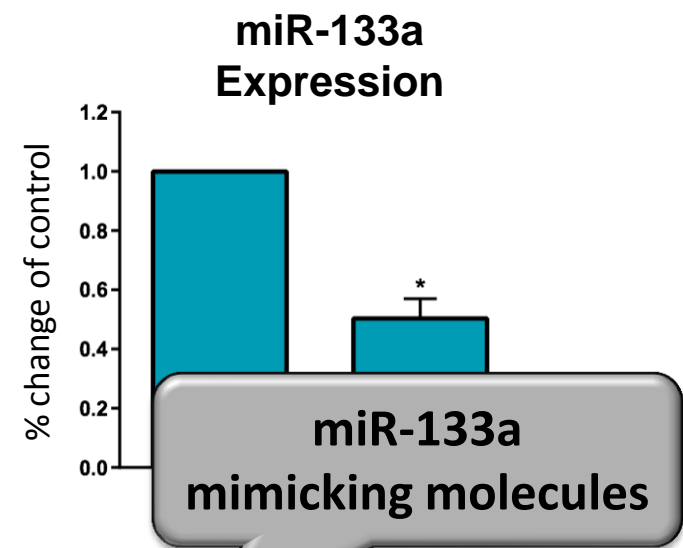
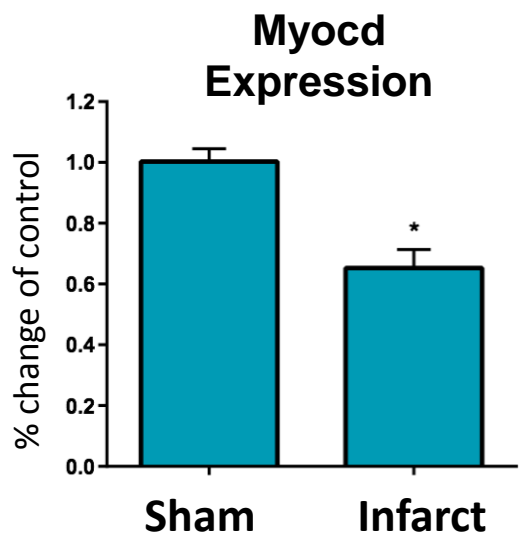
Future Directions

Impact on Health



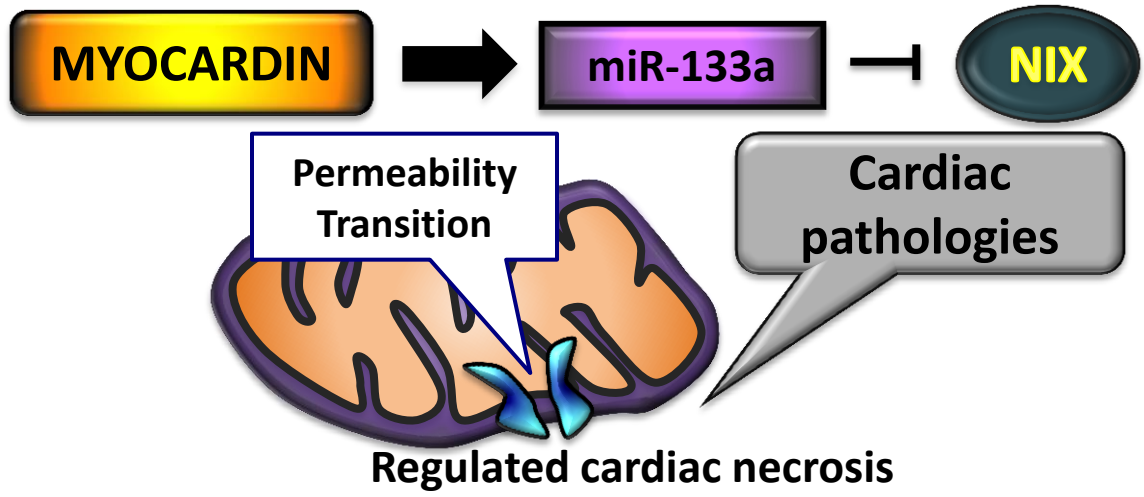
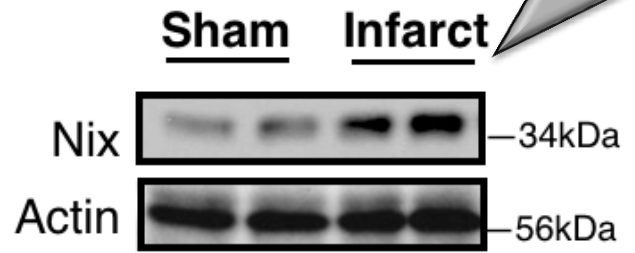
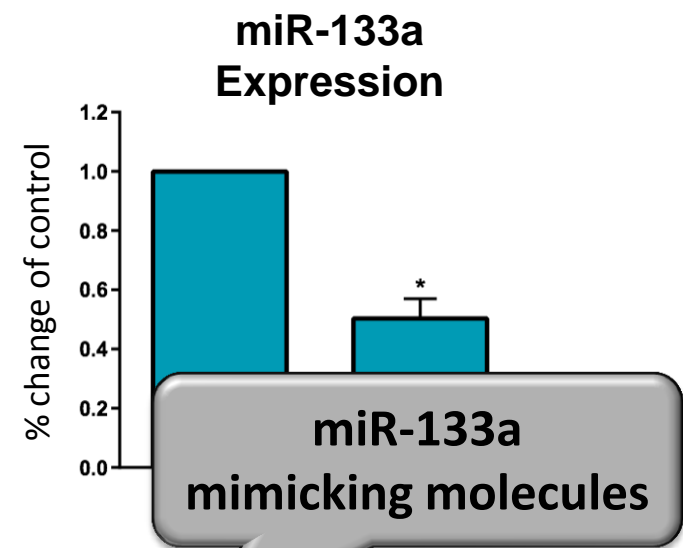
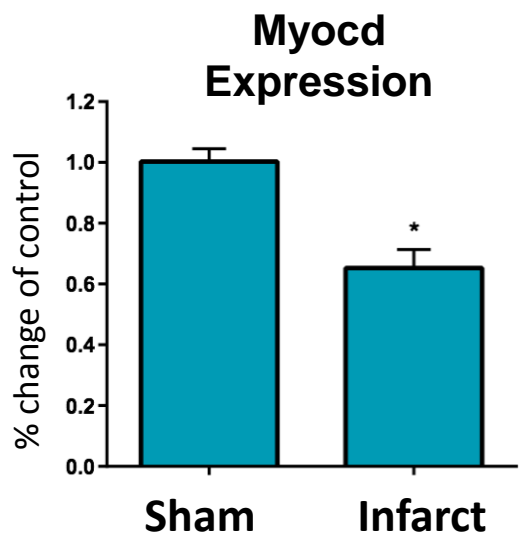
Rodent model of myocardial infarction: infarct border zone

- Introduction
- Hypothesis
- Results
- Future Directions
- Impact on Health



Rodent model of myocardial infarction: infarct border zone

- Introduction
- Hypothesis
- Results
- Future Directions
- Impact on Health



Introduction

Hypothesis

Results

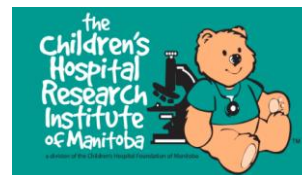
Future Directions

Thank you

- Supervisor/Mentor
Dr Joseph Gordon

- Lab
Donald Chapman
Dr Yan Hai
Dr Bill Diehl-Jones
Simone da Rosa
Jared Field
Matthew Martens
Adel Rezaei Moghadam

- Collaborators:
Dr Parmacek (University of Pennsylvania)
Dr Ian Dixon (University of Manitoba)
Dr Richard Keijzer (University of Manitoba)



UNIVERSITY
OF MANITOBA

Faculty of Health Sciences