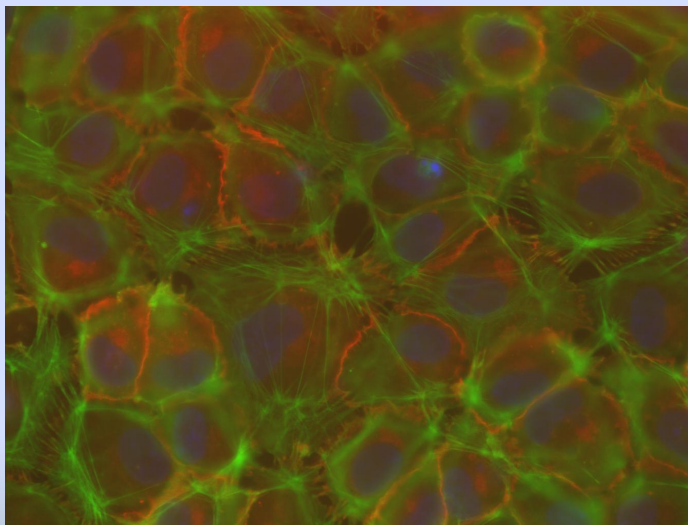


BLOOD FLOW INDUCED SHEAR STRESSES AND THE ENDOTHELIUM BIOCHEMICAL RESPONSE

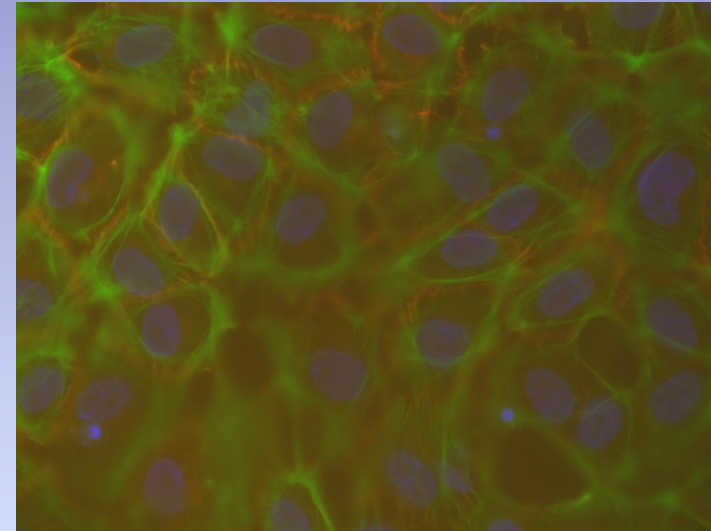
Background

Blood flow causes shear stress on the arterial wall to which the endothelial cells (ECs) respond. This may lead to cell dysfunction and arterial disease.



Nuclei
(blue)
Catenin
(red)
F-actin
(green)

a-catenin staining ECs by DMEM solution using static condition



b-catenin staining ECs by DMEM solution using static condition (thanks to Dr Sandig and Dr Xia)

Objective

A novel hemodynamic flow facility is being used to assess the effects of realistic time-varying shear stresses on the responses of live arterial ECs.

Research Carried Out

- Differences in cell response to different flow regimes have been compared, together with Immunostaining of α -catenin and β -catenin.
- A Pulsatile pump has been used to create a realistic carotid artery flow waveform.
- Analysis of the response of the ECs has been done by using Laser Scanning Confocal Microscope (LSCM).



Hemo-dynamic rig mounted on the Laser Scanning Confocal Microscope (LSCM) stage

Expected Outcomes

Measuring EC morphology changes caused by the flow-induced shear stresses will help understand the formation of diseases in arteries.