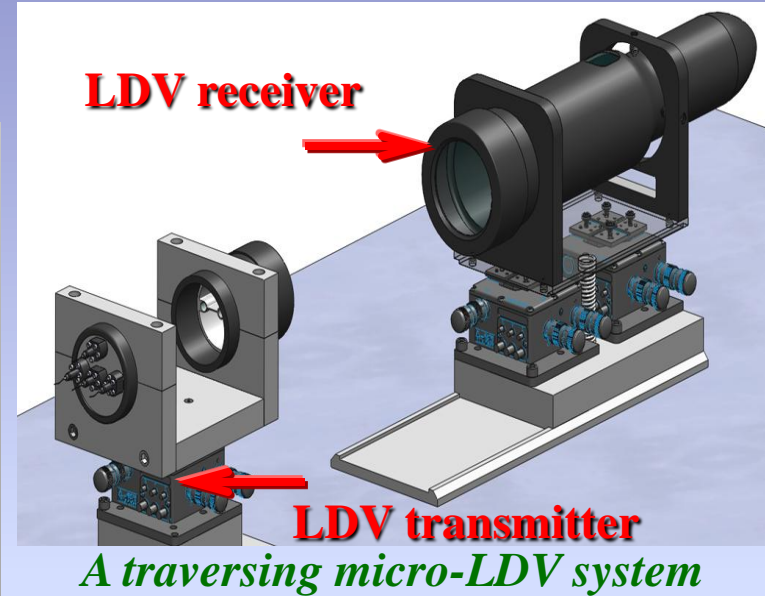


MICRO-TRAVERSING LASER VELOCIMETRY FOR NEAR-WALL FLOW MEASUREMENTS

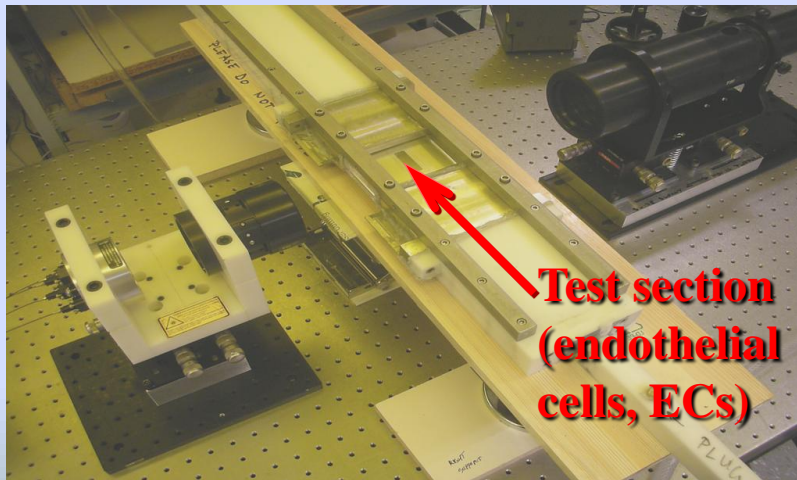
Background

Laser Doppler Velocimetry (LDV) is an advanced technique for measuring the direction and speed of fluids. Its fine spatial and temporal resolution is ideal for studying in-vitro biomedical flows.



Objective

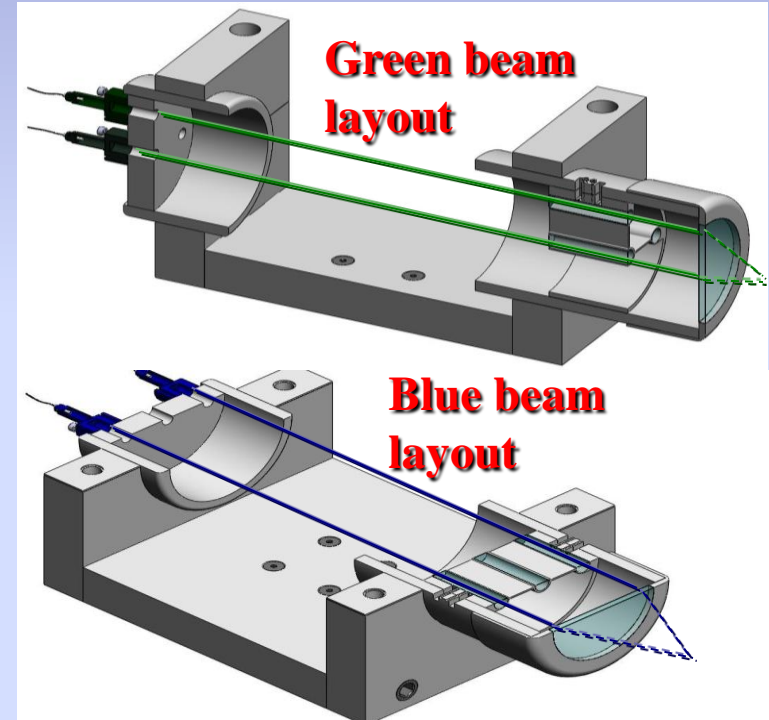
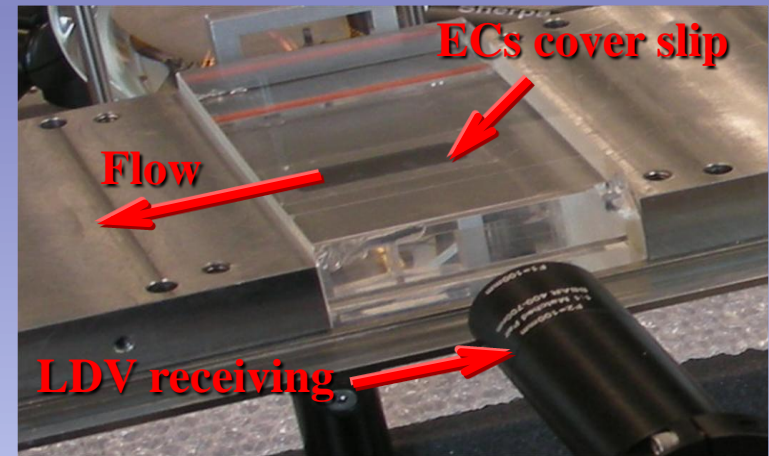
A hemodynamic flow rig is being used to quantify and correlate the surface shear stress and endothelial cell response relationship using near-wall flow measurements.



Hemodynamic rig and the LDV system during experimentation

Research to be Carried Out

- To design and construct a micro-LDV traversing system for a near-wall flow measurement approach.
- To measure a 2-D velocity field over endothelial cells (ECs) near the surface under realistic pulsatile flow conditions.
- To quantify the surface shear stress distribution over the individual ECs close to the surface using micro-optical anemometry.
- These data will be correlated to cell responses, measured in another phase of the research.



Vicinity of flow characterization (top) and section views of the in-house designed and constructed micro-LDV system (bottom)