Faculty of Engineering
Summer Research Program 2019-2020

Project Title: Design and evaluation of micro/nano surface features to reduce blood clot formation

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Objective

The aim of this project is to design, develop and evaluate blood clot formation in a micro channel capable of housing various structured surfaces.

Project Details

Cardiovascular diseases remain the number one leading cause of death in Australia. A substantial number of medical devices are being implanted into patients such as artificial hearts and valves. The interactions of blood with these surfaces has been shown to create favourable conditions for blood clots to form which can cause blockages in the cardiovascular system leading to stroke or death. Microchannels will need to be designed and fabricated using 3D printing techniques. Initially, 3D printed surfaces with micro level features will be utilized, however these will be replaced with surfaces that have been manufactured using micro and nano level techniques. Blood will be flowed through these channels to enable the real-time imaging of blood clot formation over the surface. These real-time images will be complemented with scanning electron microscopy.

Prerequisites

Candidates should have a good knowledge of fluid mechanics and have completed MEC2404/MEC3451. Candidates should be self-sufficient and driven to complete the tasks and eager to learn new concepts and technologies.