

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: ***Development of surgical training tools for artificial heart-lung machines***

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Objective

The aim of this project is to assist in the development and evaluation of new surgical training tools for artificial heart-lung machines (ECMO). The project will involve design, prototyping and testing of new surgical training tools alongside experienced clinicians and engineers.

Project Details

Heart and lung failure are major causes of death and there are insufficient donor organs available to meet demand. Mechanical devices such as artificial heart lung machines – also known as extracorporeal membrane oxygenation (ECMO) - are used to provide short to medium term life support until a donor is found or pharmaceutical therapies take effect. The implantation process for these devices is incredibly complicated, leads to significant postoperative complications, and is currently only completed by the most skilled clinicians. Researchers within the CREATElab, a Monash Engineering laboratory based on the Alfred Hospital campus, are developing novel surgical training tools that will reduce surgical times and complications and train more clinicians; meaning this critical therapy can be available more widely. This project will assist with that endeavor and involve design, prototyping and testing of the novel surgical training tools. Designs will be completed in Solidworks, prototyping will be completed using our extensive array of 3D printers and custom manufacturing equipment, and testing will occur using mechanical force rigs and through evaluation with clinicians. The successful applicant will embed themselves within our large multidisciplinary team made up of engineers (mechanical, biomedical, electrical, materials, mechatronics), biological scientists, and clinicians to develop an engineering solution for a clinically-relevant problem.

Prerequisites

No medical knowledge required. Preference for mechanical, biomedical, materials or mechatronics engineering students.

Additional Information

Applicants may be required to attend an interview