

## **Project Title: *Investigation of Lower Body Negative Pressure on the Microvascular System***

**Industry Advisor:** Advanced Research Lab for Multifunctional Lightweight Structures (ARL-MLS)

**Project ID:** ARL-MLS4

**Supervisor:** Professor Kamran Behdinan

**Disciplines Required:** ME (2)

**Disciplines still needed:**

**Start Date:** Jan. 11, 2021

**End Date:** Aug. 31, 2021

**NDA:** no

### **Project Description:**

Lower Body Negative Pressure (LBNP) creates a negative pressure gradient in the lower body drawing circulation back to the lower body and producing gravity-like loads experienced on Earth to maintain muscle health. It has been used as a therapeutic agent in the clinics for wound healing since 1834. It has been shown that LBNP at  $-25$  mmHg reduces leg muscle blood flow by 14% and increases leg volume by 2.5% in response to upright tilt. LBNP suits have been employed by NASA and other space agencies in the past on various missions, and the use of such has shown to mollify the effects of microgravity on human physiology.

### **Project Deliverables:**

In this project, we aim to investigate the effects of LBNP on microvascular systems. A complete literature survey needs to be conducted to better understand the impact of using an LBNP device on microcirculatory blood flow. A feasibility study should be performed for possible design of LBNP device for future investigation in this field.