

# **Master's Thesis:**

## **Investigation of the Effect of Wall Stiffness on Flow in Vessel Phantoms Using Magnetic Resonance Imaging**

### **Overview**

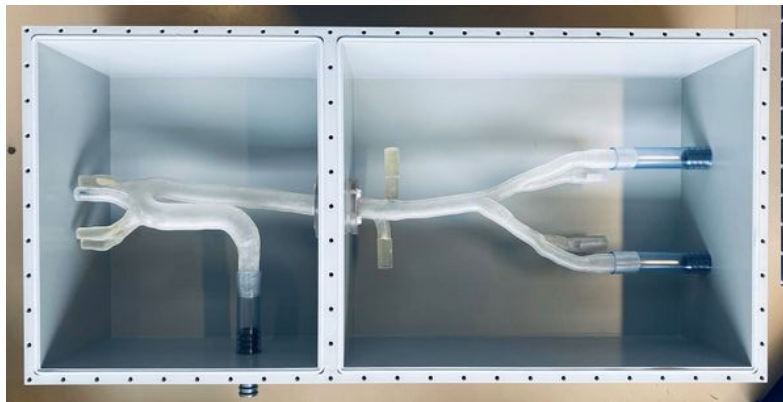
The aim of the master thesis is to study the dependency of the flow in a blood vessel on the vessel stiffness. The vessel stiffness for example in the aorta is an important indicator of vascular aging and prognostic marker for complications. While the vessel stiffness can not directly be measured with MRI, we can measure blood flow velocities. In this project, vessel models with a different wall stiffness will be constructed utilizing 3D printing and silicon molding. Constant and pulsatile flow in these phantoms will then be measured using MRI. Additionally, the models will be simulated and the flow in the vessel models will be compared to the simulations.

### **Specific Tasks**

- Literature review
- Simulating vessel models
- Creating vessel phantoms with 3D printer and silicon molding
- Phantom and in vivo MRI measurements and quantification
- Comparison of simulations and measurements
- Documentation and illustration of the results

### **Recommended Knowledge**

- Experience in simulation and modeling
- Basic git workflow



Example of a 3D printed aorta model, which is the largest blood vessel in the human body.

### **Contact**

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