BMT Institut für Biomedizinische Technik
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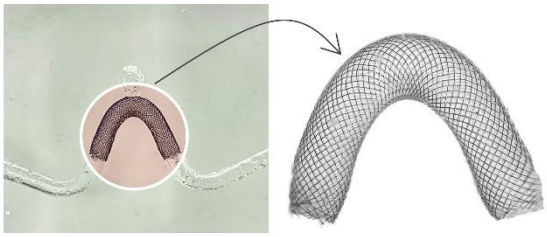
Student Project Announcement

Experimental study of compliance effect on Hemodynamics and Implant Mechanics in Cerebral Aneurysm Models Using Ultrasound and Microscopy

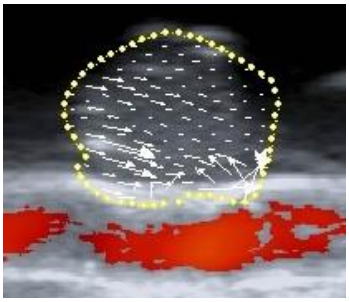
Background

Among various treatment modalities, flow diverters (FD) stand out as self-expandable implants featuring a fine-meshed structure braided of nitinol microwires. This design serves to decelerate blood flow into the aneurysm, leading to blood stagnation and subsequent thrombus formation, ultimately occluding the aneurysm. However, despite their efficacy, the success of aneurysm occlusion are frequently unpredictable.



Objective:

The primary goal of this project is to investigate how compliance of the vacular models made of hydrogels influences fluid dynamics and implant mechanics in cerebral aneurysms. Students will design and conduct experiments to simulate blood flow through these models, exploring the behavior of various implants under different compliance conditions.



Tasks:

1. Design and fabricate in vitro hydrogel vessel models mimicking cerebral aneurysms with varying degrees of compliance
2. Set up experimental protocols to simulate blood flow through the hydrogel vessel models
3. Integrate implants (flow diverters), into the models to study their deformation during the pulsation
4. Analyze experimental data to assess the impact of compliance on fluid dynamics and implant mechanics.

Start: Immediately

Supervisors:

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