TECHNISCHE UNIVERSITÄT DRESDEN

biotec molecular bioengineering Master of Science

biotec nanobiophysics Master of Science

RegBioMed

MASTER'S COURSES MOLECULAR BIOENGINEERING/ NANOBIOPHYSICS/ REGENERATIVE BIOLOGY AND MEDICINE APPLICATION OF MASTER'S THESIS

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Molecular Bioengineering ☐ Nanobiophysics ☑ Regenerative Biology and Medicine ☐

Title of the Master's thesis:

Investigation of the Fluidic Exchange Characteristics of an Open-fluidic System in 2-Photon Absorption-based 3D Printing

Start date: 20.11.2023 End date: 21.04.2024

Topic of the thesis:

The in situ material exchange is based on an open fluuidic laminar flow within a macroscopically confined region between a microscope objective and a printing substrate. Any printed structure will potentially impact the material flow and thus the times needed to fully exchange the material. This work aims to investigate the exchange process for different materials and various printed structure. The goal is to understand how existing structures and material viscosity impact the material exchange characteristics. Furthermore, metrics have to be defined for a successful exchange process using in-line process monitoring with a grayscale video stream or potentially fluorescence microscopy. In addition to fluorescence signals, the process characteristics could be for example based on variations in the refractive index of the materials and respective patterns being observable during the exchange process. Potential test structures will be for example stacked optics as they can be used in advanced fiber optical endoscopes.

Dresden, Pratyaksh
Place, Date Signature of the student

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DRESDEN concept Exzellenz aus Wissenschaft und Kultur

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I hereby agree to be assessor for the thesis mentioned above. I agree with the title of the thesis. I am aware that the duration of the evaluation process should not exceed four weeks.

Dresden, 19.10.23
Place, Date

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Place, Date

Signature of the assessor

Remarks:

Start and end date: The thesis will normally take 22 weeks. It can only be extended by up to 2 months upon written request to the examination committee, which must include adequate justification for the requested extension. As an example, health problems documented by medical certificates can be sound reasons for an extension request, while slow progress or problems with the execution of the work will not be accepted.

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Title: The title of your thesis is provisional at this stage and the final title that appears in the thesis when you hand it in may be slightly different. Note, however, that a complete change of topic will require written permission.

Topic of thesis: Here you should write a page outlining the topic of your thesis and the approach that you will take. This outline should give a broad introduction into the topic and quote one or two papers relevant to your work. It should list the specific objectives of your thesis proposal and how you are going to achieve those objectives. For more space, please create an additional annex.