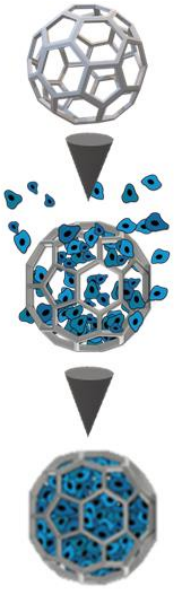
PhD position in material science and tissue engineering

PhD Position open in the field of **3D printing, materials science, tissue engineering and cell culture models** at the TU Wien (Vienna, Austria) within the research group "3D Printing and Biofabrication". The candidate will work on stem cell scaffolded spheroids for disc repair.

Numerous attempts for alleviating low back pain (LBP) have been presented by either injecting single cell suspensions (cell-based therapy) or delivering biomaterial matrices (scaffold-based therapy). Still, LBP remains a redundant healthcare burden for our society, and searching for new and more ambitious therapeutic modalities to stimulate intervertebral disc (IVD) repair is of high relevance.

The project: Regenerating IVD tissues through the Third TERM approach

We have recently shown that a new strategy, called the "third tissue engineering" can bring unprecedented opportunity in the field of tissue repair [1,2]. This original strategy consists in creating injectable tissue units containing stem cell spheroids encaged within micro-size scaffolds.



The fabrication of multiple of those microscaffolds with high porosity and thin struts is permitted thanks to the high-resolution capability of multiphoton lithography (MPL) 3D printing that we have developed in our group.

Our goal and what we offer

We envision to attack the problem of poor IVD regeneration potential of the existing therapies, through an unprecedented approach requiring multidisciplinary expertise, with partners in Austria (TU Wien) and Switzerland (AO, Davos). 266 million francs for cutting-edge research projects (snf.ch)

We offer a 4 years PhD position, which aims are (1) to design and to 3D print using 2-PP microscaffolds and to functionalize them, (2) to assess *in vitro* the differentiation potential of stem cells into suitable tissue, and (3) to study the injectability and the self-assembly of those building blocks into IVD-like tissue

Your job

- ➔ Design, print and characterize the 2PP printed microscaffolds.
- ➔ Develop strategy for biomaterials functionalization.
- ➔ Grow spheroids and characterize *in vitro* the encapsulated cells depending on the micro-environment.

Institute of Material Science and Technology E308
Technische Universität Wien
Getreidemarkt 9, 1060, Wien

Your profile

Applicant should have experience in material science and cell culture. Experience in characterizing cells and/or bioprinted tissues such as gene expression (i.e. RT-PCR), microscopy imaging or (immuno)-histology would be positively appreciated.

We seek for highly motivated students, with team-oriented mind and interested in multi-disciplinary projects.

What we offer

The successful candidate will join a highly interdisciplinary and multinational research laboratory with excellent infrastructure in the heart of Vienna. A new Cell Culture Core Facility at the TU Wien is being finalized, gathering cutting-edge pieces of equipment such as several SEM, LSM, Bioprinters, Sorters, etc.

Our research projects are at the interface of engineering, material development and biomedical research, including 3D bioprinting: https://www.tuwien.at/koop/amt

The PhD candidate will be registered at the TU Wien, full-time position (30hrs/week), with gross month salary of 2300 €. Application will be open until end of January 2023. For the success of this project, the candidate will strongly collaborate with a postdoc and another PhD to be hosted at TU Wien and at the AO Foundation respectively.

For further information, you are welcome to contact Dr. Olivier Guillaume E-mail: olivier.guillaume@tuwien.ac.at

Application documents:

- A motivation letter listing significant achievements, relevant experience referring to the description of this position and indicating preferred start date (1 page)
- CV, including education / internship / employment / publication record (if existing)
- Names of advisors who could provide a reference, if already available the reference letters can be included with the application

Qualified candidates should apply by sending the above documents by the 31st of January 2023 via e-mail with the subject line "***PhD Application DiskedInj***" to: olivier.guillaume@tuwien.ac.at

We look forward to receiving your application and getting to know you personally!
[Institute of Materials Science and -Technology (E308), TU Wien, Getreidemarkt 9, Vienna, Austria]

Important: The submitted files should not exceed 5 Mb in total.

Literature

[1] Ovsianikov A. et al., Trends in Biotechnology, Vol. 36, No. 4, 2018. [2] Guillaume O. et al., Acta Biomaterialia, 2022