

Biofabrication in Würzburg Location Benefits



Fakultät für
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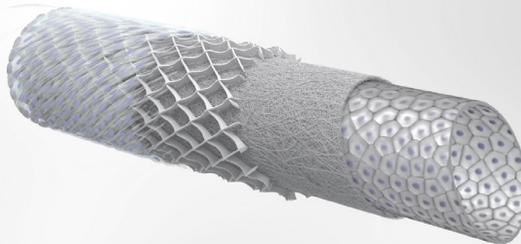
The **Julius-Maximilians-Universität Würzburg** has around 29,000 students and a high international reputation, especially in the field of natural and life sciences. The **diverse range of teaching and research** is complemented by an attractive environment in which it is excellent to study, research and live.

In addition to **cultural highlights** such as the residence, the Marienberg fortress and numerous museums and theaters, Würzburg offers not only a **varied leisure program** for students, but also a diverse nightlife.

The Faculty of Chemistry and Pharmacy stands for **interdisciplinary research** with a great reputation in science and also in industry. 38 professors teach around 2300 students. **The quality of teaching** is ensured by regular evaluations. **A comprehensive range of support and excellent laboratory equipment** enable excellent chemical training in a research-related environment.

Master's Degree in Biofabrication at a glance:

- Duration: 4 semesters (1 semester theory, 3 semester practical training)
- Start: Winter semester
- Admission: Eligibility test
- Application deadline: July 15



Contact

Prof. Dr. Jürgen Groll
Jun.-Prof. Dr. Tomasz Jüngst
Dr. Andrea Ewald

master.biofabrikation@uni-wuerzburg.de



Nobel laureates of the faculty



Fischer, 1902 Arrhenius, 1903 Buchner, 1907 Nernst, 1920 Michel, 1988

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Published by faculty of chemistry and pharmacy of Julius-Maximilians-Würzburg.
Date 04/2022. Subject to change

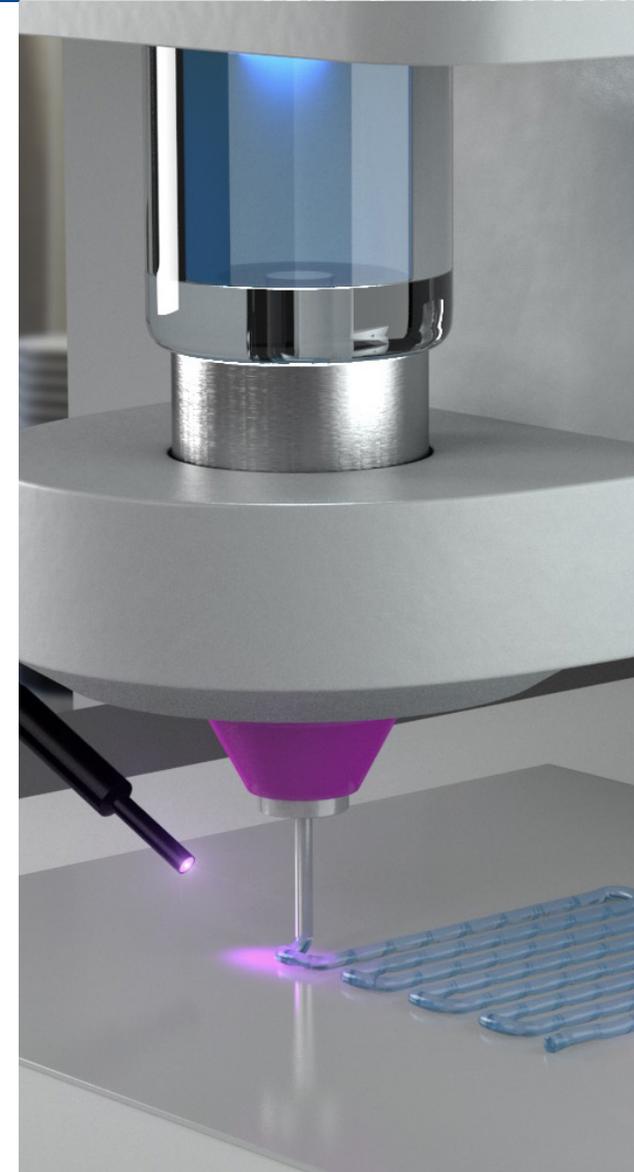
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Biofabrication Master of Science

Apply until July 15

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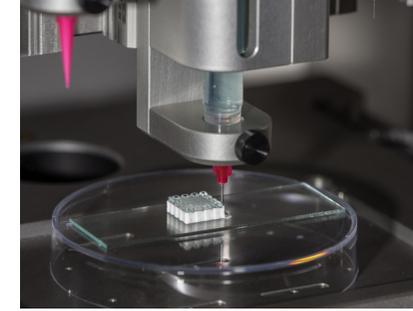
Biofabrication in Würzburg

Goals, Content, Structure

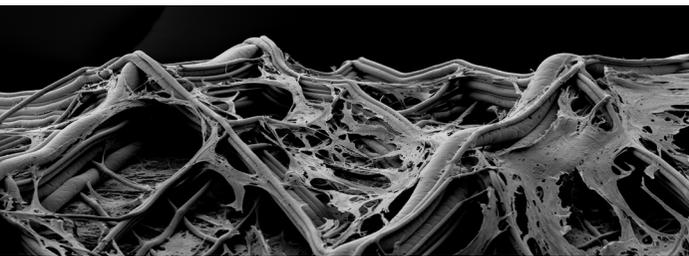


Biofabrication in Würzburg

Projects and Career Perspective



Biofabrication is the “the automated generation of biologically functional products with structural organization from living cells, bioactive molecules, biomaterials, cell aggregates such as micro-tissues, or hybrid cell-material constructs, through bioprinting or bioassembly and subsequent tissue maturation processes.” (Groll *et al.* Biofabrication 2016, 8(1), 013001) The aim of Biofabrication is to use automated processes like Additive Manufacturing to fabricate hierarchical biofunctional constructs in a spatial arrangement that allows maturation into tissue models with functional properties. This holds the possibility for automated production of functional tissue models that are be highly valuable for the replacement of animal tests, pharmaceutical and cancer research as well as regenerative therapy options.

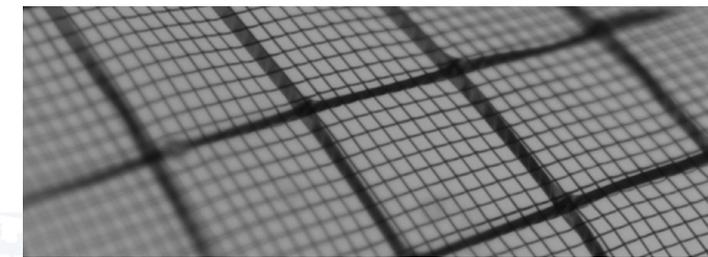


The study course of Biofabrication is highly interdisciplinary and mainly deals with the application of additive manufacturing techniques such as 3D bioprinting and bioink development. The program offers students scientific lectures and practical exercises in the field of 3D printing technologies for use in biotechnology. Most of the courses in Würzburg are held in German. Research-based work and practice-oriented learning as well as the interdisciplinary orientation characterize the Master's degree. In the first semester, courses are attended at the University of Würzburg. In the 2nd and 3rd semester, scientific research internships are carried out, which can be in Würzburg or abroad. The 4th semester comprises the master project.

The Master's degree requires a bachelor's degree, with 80 ECTS credits from the fields relevant for inorganic, organic and physical chemistry. Furthermore, 10 ECTS points are required in theoretical and practical fields of Biofabrication (e.g. polymer science, rheology, materials science, mathematics, computer science, mechatronics, biochemistry or (molecular) cell biology). The candidates that can't have proof of these credits, can acquire those via additional courses before the study program. Participation in an interview process is compulsory. The provisional admission to the Master's degree can be granted if at least 150 ECTS credits are awarded in a corresponding bachelor's program.

If you have any questions about the requirements, please send them to master.biofabrikation@uni-wuerzburg.de. For candidates with a degree from a non-German-speaking institution, proof of sufficient knowledge of German is required. Further details on the application process can be found on following website: <https://www.chemie.uni-wuerzburg.de/studium/studiengaenge/biofabrikation/>

The University of Würzburg has great expertise and international visibility in the field of Biofabrication. Current projects in the Biofabrication team are focused on investigation of new materials for bioinks, the optimization of existing materials using macromolecular chemistry and the development of materials for new bioprinting approaches. Biofabrication of artificial vascular structures, gradients for functional tissue modeling, on-chip Biofabrication, expansion of the Biofabrication window of bioinks such as hybrid hydrogel with excellent printability, shape fidelity and cyto-compatibility for 3D bioprinting are just some of the research areas in the team. Further details about the projects and publications can be found under the following link: <https://www.fmz.uni-wuerzburg.de/biofabrication/>



Biofabrication – Master of science (120 ECTS)

Semester	Course Category	Course Name
1	Mandatory	Polymers II (in German)
		Biofabrication (in English)
		Physical Chemistry of Supramolecular Structures (in German)
2	Electives	Fundamentals of Tissue Engineering and Quality Management (in German)
		Carrier Materials for Medicinal Active Ingredients (in German)
		Fundamentals of Supramolecular Chemistry (in German)
3	Electives	Polymer Materials 1: Technology of Modifying Polymer Materials (in German)
		BioFab Research Internship 1 (German/English)
4	Electives	BioFab Research Internship 2 (German/English)
		Master Thesis Biofabrication and Final Colloquium (German/English)

In lectures, during projects and as part of their thesis, the students deal with current research topics independently and critically. They learn the basics of good scientific practice, ethical issues and economic developments in the subject area. This also includes reflecting on the ethical consequences of one's own work for the industry and society. Graduates are consequently able to peruse their career in academia or outside of university in areas such as economy, new start-ups in the biomedical engineering sector or industry.