

## Who are we?

The SFB/TRR 225 explores the fundamentals of biofabrication for the generation of functional human tissue models.



Biofabrication uses automated 3D printing processes to produce hierarchical cell-material constructs in a defined spatial arrangement. In combination with bioreactors, biofabricates can mature into tissue models with desirable functional properties. Biofabricated tissue models can replace animal tests e.g. for pharmaceutical and cancer research, and hold enormous potential as regenerative therapy options.

During the first funding period of the TRR225, we mainly focused on the development of materials and processes that facilitate high cell survival in the printing process. Subsequently, the post-fabrication behavior of the cells in the printed constructs has become a major focus.

Our aim is to optimize biofabrication conditions to achieve desired cell behavior beyond long-term survival, such as cell proliferation or differentiation. Therefore, in the second funding period, the TRR225 will develop new materials and methods for the construction of tissue models such as cardiac and skeletal muscle, kidney tissue, or cancer tissue.

### Spokesman Würzburg:

Prof. Dr. Jürgen Groll

### Site-speaker Erlangen:

Prof. Dr.-Ing. Aldo R. Boccaccini

### Site-speaker Bayreuth:

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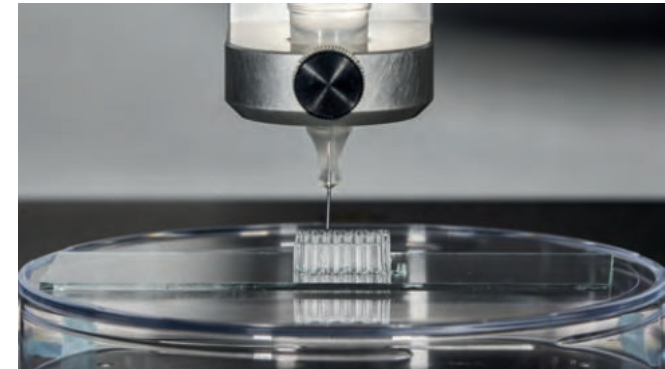


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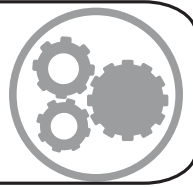


## From the Fundamentals of Biofabrication towards Functional Tissue Models



## Z01: Central tasks

Prof. Dr. Jürgen Groll



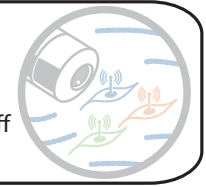
## Z02: Imaging platforms

Prof. Dr. Katrin Heinze  
Prof. Dr. Dr. Oliver Friedrich  
Prof. Dr. Matthias Weiss



## Z03: Fluorescent reporter cells

Prof. Dr. Anja Bosserhoff



### Project Area A. BioInks

New functional and responsive bioinks

#### A01. Functionalized alginate + gelatine

Prof. Dr. Aldo R. Boccaccini  
Prof. Dr. Ben Fabry

#### A07. Fiber-reinforced hydrogels

Dr. Gregor Lang  
Dr. Natascha Schäfer  
Prof. Dr. Dirk W. Schubert

#### A02. Functionalized hyaluronic acid

Prof. Dr. Torsten Blunk  
Dr. habil. Jörg Teßmar

#### A08. Vascular supply for 3D tissue

Prof. Dr. Leonid Ionov  
Prof. Dr. Thomas Scheibel

#### A06. Cell-loaded microgels

Prof. Dr. Stephan Förster  
Prof. Dr. Jürgen Groll

### Project Area B. Processes and Methods

Precise and reproducible manufacturing processes and methods

#### B02. Microvascular networks

Prof. Dr. Iwona Cicha  
Prof. Dr. Jürgen Groll

#### B03. Print-Bioreactor Integration

Prof. Dr. Aldo R. Boccaccini  
Prof. Dr. Frank Döpfer  
Dr. Sahar Salehi

#### B04. 3D printing of vascular structures

Prof. Dr. Süleyman Ergün  
Prof. Dr. Jürgen Groll

#### B05. Membrane-Engineering

Prof. Dr. Regina Ebert  
Prof. Dr. Jürgen Seibel

#### B06. Reporter conjugated bioinks

Dr. Rainer Detsch  
Prof. Dr. Tessa Lühmann

#### B07. Micro particle sensor systems

Dr. Krystyna Albrecht-Groll  
Prof. Dr. Stephan Gekle  
Prof. Dr. Georg Papastavrou

#### B09. Biofabricated gradients

Dr. Silvia Budday  
Prof. Dr. Tomasz Jüngst

### Project Area C. Biofabricated Models

Construction of first tissue models

#### C01. Heart substitute tissue

Prof. Dr. Felix Engel  
Prof. Dr. Thomas Scheibel

#### C02. Stromal parameters in 3D tumor models

Prof. Dr. Torsten Blunk  
Prof. Dr. Ben Fabry

#### C03. Tumor dormancy models

Prof. Dr. Andreas Arkudas  
Prof. Dr. Anja Bosserhoff  
PD Dr. Annika Kengelbach-Weigand

#### C04. Vascularized tissue container

Prof. Dr. Dr. Raymund E. Horch  
Prof. Dr. Harald Wajant

#### C05. Ultra-soft matrix composites

Prof. Dr. Reiner Strick  
Prof. Dr. Carmen Villmann

#### C06. Glomerular ex vivo model

Dr. Taufiq Ahmad  
Prof. Dr. Janina Müller-Deile

