Experimental Trauma Surgery
Medical Faculty
Justus-Liebig University of Giessen (Germany)

2019 Programme of the 2nd International Conference on Trauma Surgery Technology in Giessen

11 to 13 October 2019
Funded by the Deutsche Forschungsgemeinschaft

University Medical Faculty
Giessen (Germany)

2019 Programme of the 2nd International Conference on Trauma Surgery Technology in Giessen
Editors: WA Bosbach, A Presas, A Mieczakowski, C Heiss

Conference Organisation at JLU Giessen

WA Bosbach, S Drahorad, M Hofacker, M Ebeling, KE Bosbach, C Bosbach

Scientific Committee and Editors of the Proceedings

WA Bosbach (Justus-Liebig University of Giessen, Germany)
A Presas (Universitat Politècnica de Catalunya)
A Mieczakowski (University of Cambridge, UK)
C Heiss (Justus-Liebig University of Giessen, Germany)

Funded by

Deutsche Forschungsgemeinschaft (DFG)
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DFG grant BO 4961/3-1

3rd conference: Multifunctional trauma surgery implants
DFG grant BO 4961/6-1
Summer 2020
homepage https://www.uni-giessen.de/fbz/fb11/institute/klinik/chirurgie/uch/forschung/trauma-surgery-technology-conference-2020

2nd conference: Vibration in oncological and antibacterial therapy
DFG grant BO 4961/3-1
11 - 13 Oct 2019
homepage https://www.uni-giessen.de/fbz/fb11/institute/klinik/chirurgie/uch/forschung/trauma-surgery-technology-conference-2019/

1st conference: Patient centred technology design in traumatology
DFG grant BO 4961/4-1
16 - 18 Nov 2018
published proceedings https://doi.org/10.17863/CAM.34582
homepage https://www.uni-giessen.de/fbz/fb11/institute/klinik/chirurgie/uch/forschung/trauma-surgery-technology

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Preface

Dear Colleagues

It is now for a 2nd time that we can invite researchers to come to Giessen for an international exchange of latest research and a discussion of ideas. This year again, the Deutsche Forschungsgemeinschaft (DFG) is sponsoring the event.

The main topic for **2019** is **vibration in antibacterial and oncological therapy**. Many effects of mechanical vibration on tissue have been discovered so far. Clinical applications relying on vibration exist for a variety of conditions. The intracellular processes however are still largely not understood. And reproducibility remains a matter of potential for improvement.

During the last year, we have worked on building **vibration bioreactor prototypes** for the controlled exposure of *in-vitro* cell cultures to resonance vibration. We see great potential for piezoelectric patches (PZTp) as mechanical actuators. Compared to ultrasound, the controllability of vibration frequency and local vibration energy density is an important advantage. With the support from the **DFG and the Justus-Liebig Fellowship**, we have been able to collaborate with the **Grandfield Lab at McMaster University** in Ontario (Canada) for the performing of cell vibration experiments on Saos-2 cells. The analyses of the exposed cell cultures are still going on and we are working on their submission for publication.

Figure: Bosco, Joe, Kathryn, Alex, and Bryan during lunchbreak at McMaster University (Canada) on 07 Sept 2019. Results from the cell vibration experiments are being prepared for submission for publication.

In Giessen, day 1 will be used for hosting the talks of the participants. Day 2 will be again as in the previous year an interactive session with the possibility for exchanging ideas for future work and also an osteosynthesis workshop.

DFG funds for the **3rd conference in 2020** have already been approved. Anna, Bosco, and Wolfram will host next year the event with a focus on **multifunctional trauma surgery implants**.

Welcome to Giessen, your scientific committee

Programme overview

Friday, 11 Oct 2019

- Lunch meeting for early arrivals from Toronto, Oxford, Cambridge, Saarbrucken
- Hotel check-in
- Get-together at the Giessen Old Brewery

Day 1 - Saturday, 12 Oct 2019

- Registration, presentations with lunch break
- Dinner party at the Giessen Boat House

Day 2 - Sunday, 13 Oct 2019

- Interactive morning session:
  Osteosynthesis workshop (Dr Biehl)
  Workshop on technology transfer into clinical application (Dr Mieczakowski)
  Lunch break
- Departure by shuttle to Frankfurt airport for 5 pm flight connections or by train

Conference Wi-Fi

Network: ugitag

User name: DFG

Password: 11ach13

Conference hotline

Call Larry on +49-157-381-926-54

Detailed programme

Friday, 11 Oct 2019

12.00 pm Midday lunch and lunch meeting

at Giessen Medical Faculty

for early arrivals from Toronto, Cambridge, Bremen, Freiburg

From 02.00 pm Hotel check-in at Hotel Kübel possible

From 08.00 pm Evening get-together at the Giessen Old Brewery

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Day 1 - Saturday, 12 Oct 2019

08.00 am Breakfast at Hotel Kübel

From 09.00 am Registration

09.30 am Introductory session

- Bosbach, WA: *Workshop Structure*
- Heiss, C: *Trends in Modern Trauma Surgery*
- Presas, A: *Vibration Theory*

10.30 am Coffee break

10.45 am Session 1 - Chair: Mele, E

- Roehr, C: *Numerical Design Study for the Development of a Resonance Mechanics Bioreactor for Osteosarcoma Cell Experiments*
- Bosbach, WA: *Vibration energy density in bovine modelling and bioreactor design*
- Presas, A: *A mechanical assembly for experiments of Saos-2 cells under vibration actuation*
- Loy, LT: *The effect of BDNF-functionalised PEC-NP on the vitality and proliferation of an osteocyte-neuron-coculture*

12.30 pm Lunch break & group photo

01.15 pm Session 2 - Chair: Bosbach, WA

- Wohl, G: *Electrical charge in bone – a mechanism for bone adaptation*
- Mele, E: *Composite nanofibrous architectures: towards electroactive scaffolds for tissue engineering*
- Prieto-Lopez, L: *Slippery surfaces for anti-fouling application*
- Biehl, C: *Treatment alternatives for secondary infections after pilon fractures*
- Schiebl, J: *Development and first evaluation of a biomimetic rasping tool: An opportunity for facilitated hip surgery?*

03.15 pm Coffee break

03.30 pm Session 3 - Chair: Wohl, G

- Tankasala, H: *Interpretation of 'stiffness' in biological networks*
- Senge, FJ: *Persistence-based kernel methods for topological data analysis*
- Jakubov, A: *NiTi Stent with PLA Coating*
- Yu, B: *Opportunities for the Development of Additive Manufactured Parts in Health and Trauma Applications*
- Mieczakowski, A: *New Generation Nano Sensor for Improved Wound Healing*

08.00 pm Dinner party at the Giessen Boat House

Day 2 - Sunday, 13 Oct 2019

08.00 am Breakfast at Hotel Kübel

09.30 am Interactive morning session:

- **Osteosynthesis workshop (Dr Biehl)**
- **Workshop on technology transfer into clinical application (Dr Mieczakowski)**

01.00 pm Lunch break

From 02.00 pm Departure by shuttle to Frankfurt airport for 5 pm flight connections
or departure by train from Giessen train station

Conference venue: Giessen University Medical Faculty

29, Klinikstrasse

Giessen 35390

Germany

Image source: by friendly permission of Landesbetrieb Bau und Immobilien Hessen, Mr Hoffmann on 27 Sept 2018 by email.

Hotel: Hotel Kübel

20, Westanlage

Giessen 35390

Germany

Restaurant 11 Oct 2019: Old Brewery Giessen

30-32, Westanlage

Giessen 35390

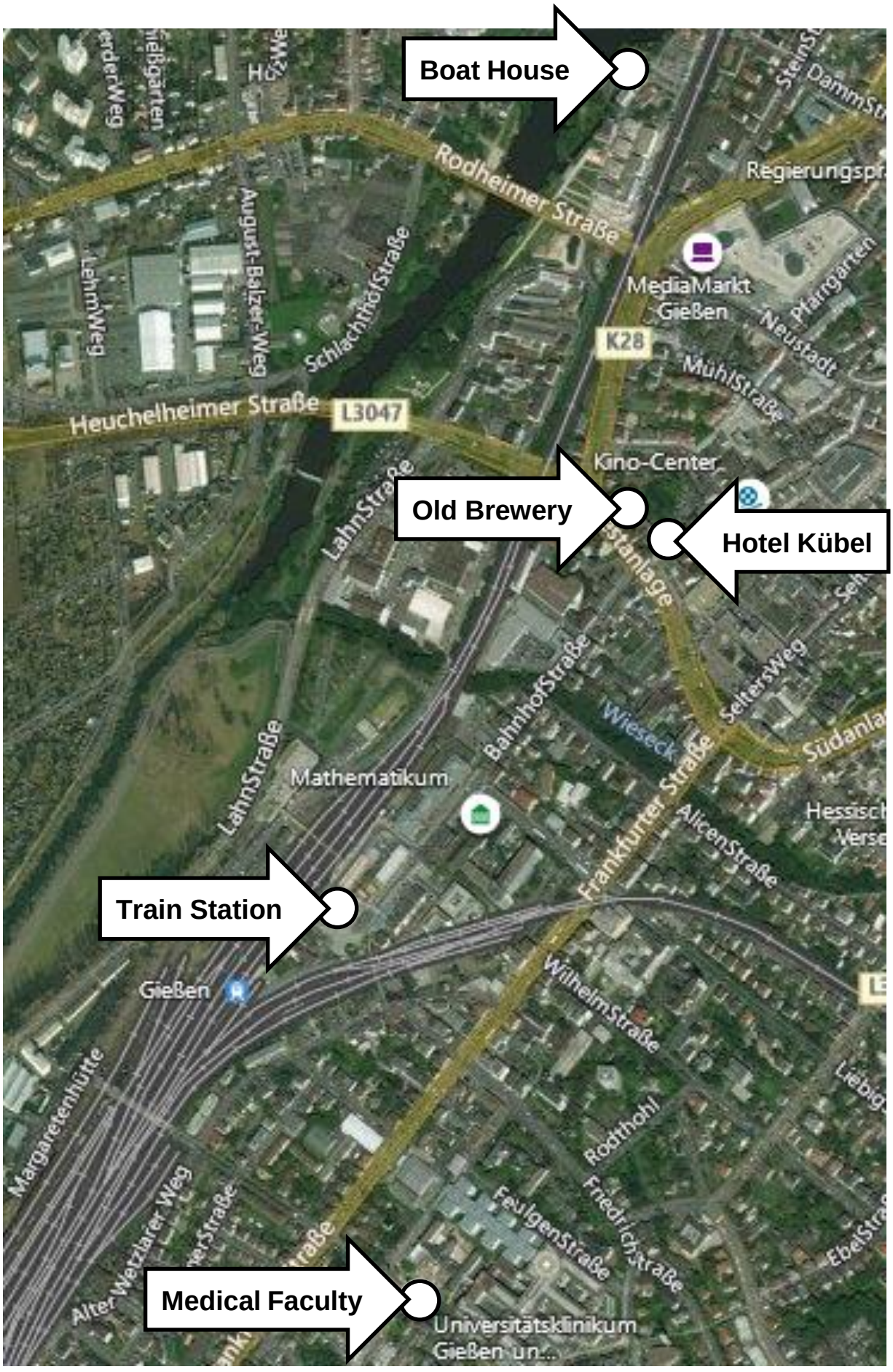
Germany

Restaurant 12 Oct 2019: Boat House Giessen

12, Bootshausstraße

Giessen 35390

Germany



Source: www.bing.com/maps, date accessed 27 April 2019

Participants

United Kingdom

Dr Mele, Elisa, University of Loughborough

Dr Mieczakowski, Anna, University of Cambridge

Dr Tankasala, Harika, University of Cambridge

Canada

Prof Wohl, Gregory, McMaster University

Dr Yu, Bosco, McMaster University

Russia

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Catalonia

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Germany Non-Giessen

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Bosbach, Konstantin E, University of Freiburg

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Senge, Jan F, University of Bremen

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Otto, Mark, Justus-Liebig University of Giessen

Roehr, Charline, Justus-Liebig University of Giessen