

Biennial Meeting

ViCEM – Vienna Center for Engineering in Medicine

Dezember 12-13, 2023

**Medical University
Jugendstilhörsaal**

Spitalgasse 23, 1090 Wien
Bauteil 88, Ebene 02

Dez 12 | Medical University of Vienna | Jugendstilhōrsaal

09:00 Registration

09:45 **Welcome**

Sylvia Nürnbergger
Christian Hellmich

Keynote lecture

Chair: Sylvia Nürnbergger (MedUni)

10:00 An integrated, multi-scale approach to understand the role of mechanical loading in cartilage homeostasis and disease: Bridging from joint to chondrocyte

Prof. Ilse Jonker (University Katholieke Universiteit Leuven, Human Movement Biomechanics Research Group)

Invited talk

Chair: Sylvia Nürnbergger (MedUni)

10:40 New approaches in rehabilitation after cartilage repair

Barbara Wondrasch (Univ. of Applied Science St Pölten, Institute of Health Science)

11:00 **Coffee break**

Session I

Chair: Christian Hellmich (TU)

11:30 Artificial intelligence in endoprosthesis.

Stephanie Huber (MedUni / OSS)

11:45 Human factors evaluation of left ventricular assist device peripherals: an eye tracking supported simulation study

Thomas Schlöglhofer (MedUni)

12:00 Fluid-structure-interaction simulation of bioprosthetic aortic valve using an anisotropic hyperelastic leaflet material model

Benedikt Riebartsch (MedUni)

12:15 Continuous prediction of intraoperative blood pressure using transformer models

Lorenz Kapral (LBI DHPS)

12:30 Exploring relationships between heart rate and activity in heart failure patients using deep learning

Laurenz Berger (MedUni)

- 12:45 An atraumatic mock loop for realistic hemocompatibility assessment of blood pumps
Markus Granegger (MedUni)
- 13:00 3D Shockwave Modelling of the Efficacy of Secondary Reflectors in Low Intensity Shockwave Therapy to the Penis
Hannah Janout (LBI Trauma)
- 13:15 **Panel discussion**
- 13:30 **Lunch break**
- Rapid-fire young investigator presentations I**
of ongoing (joint) PhD projects accompanied by a poster
Chairs: Jürgen Stampfl (TU), Lena Hirtler (MedUni)
- 14:30 *Inverse bone remodelling: towards predicting the hip joint pressure distributions*
Sebastian Bachmann (TU)
- 14:35 *Multimodal micro-mechanical and compositional imaging of human menisci*
Aleksandra Lebedeva (TU)
- 14:40 *New non-invasive, label-free monitoring approach for 2D and 3D cell culture*
Philipp Paulitschke (LMU Munich)
- 14:45 *Fabrication of an auxetic patch via 3D printing with anisotropic mechanical behavior for cardiac tissue engineering*
Lukas Pichelkastner (MedUni)
- 14:50 *The influence of explainable vs. non-explainable clinical decision support systems on rapid triage decisions*
Daniel Laxar (MedUni)
- 14:55 *Effect of scaffold stiffness and mechanical stimulation on tendon tissue engineered constructs*
Ekaterina Oleinik (TU)
- 15:00 *Soft matter in confinement and the creation of life*
Iago Peters (TU)
- 15:05 *3D analytical beam theory for magnesium pin-implanted rat femur*
Lukas Pircher (TU)

15:10 *Scaffolded spheroids - generating decellularized cell-derived ECM as modular units for tissue engineering*
Lisa Marie Gaul (TU)

15:15 **Coffee break**

Session II

Chair: Dieter Pahr (TU)

15:45 Nano- and micromechanics of collagen fibrils collagen-rich tissues and tissue models
Phillip Thurner (TU)

16:00 Collagen – from distributions in tissue to biomechanical effects
Martina Marchetti-Deschmann (TU)

16:15 The origin of surface charge for tough biomedical hydrogels
Martin Frauenlob (TU)

16:30 Femoral stability after cephalomedullary nail removal – an ex-vivo study with clinical implications
Gilbert Schwarz (MedUni)

16:45 Recombinant lubricin improves anti-adhesive, wear protection and lubrication of collagen II surface
Laura Mears (TU)

17:00 Gamma-irradiation induces structural matrix changes in auricular cartilage scaffolds
Isabel Casado Losada (MedUni)

17:15 Damage-induced wounding causes an immediate healing response
Nadja Ring (LBG SHoW)

17:30 **Panel discussion**

17:45 – 19:00
Networking & wine

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Dez 13 | Medical University of Vienna | Jugendstilhörsaal

09:00 Registration & coffee

Keynote Lecture

Chair: Sylvia Nürnberger (MedUni)

10:00 Engineering grafts, models and processes for regenerative medicine
Prof. Ivan Martin (University Hospital Basel; Director of the Department of Biomedicine)

Invited talk

Chair: Sylvia Nürnberger (MedUni)

10:40 Biomaterial design for EV-based wound patches
Christina Schuh (Universidad del Desarrollo)

Session III

Chair: Oliver Kimberer (MedUni)

11:00 Biomicromill, a medical device for mild and efficient isolation of therapeutic cells from adipose tissue
Susanne Wolbank (LBI Trauma)

11:15 Extracellular vesicles from hofa fat pad derived mesenchymal stem cells - silver linings for cartilage repair?
Andrea De luna (UWK)

11:30 The fascinating world of musculoskeletal disease modelling with lab-on-a-chip and organ-on-a-chip technologies
Mario Rothbauer (MedUni)

11:45 In situ curable adhesive system for bone repair
Stefan Baudis (TU)

12:00 **Panel discussion**

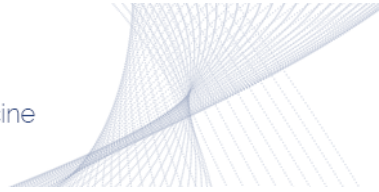
12:15 **Coffee break**

Rapid-fire young investigator presentations II

of ongoing (joint) PhD projects accompanied by a poster

Chairs: Susanne Wolbank (LBI), Mario Rothbauer (MedUni)

12:45 *Design, evaluation of a microfluidic bioprinting system for 3D deposition of hierarchical vascular networks using an hpcECM-derived bioink*
Felix Pointner (MedUni)



- 12:50 *3D liver-on-chip mimicking hepatic lobule through multiphoton laser patterning*
Masafumi Watanabe (TU)
- 12:55 *Development of a gut-ENS on a chip model*
Alexandra Lorenz (TU)
- 13:00 *Developing a brain-on-chip model for drug delivery and disease modeling*
Sophie Schweinitzer (TU)
- 13:05 *Utilizing left ventricular assist device pump parameters for real-time cardiovascular monitoring in end-stage heart failure patients*
Theodor Abart (MedUni)
- 13:10 *Synthetic polymer-peptide conjugated materials as a potential chronic wound treatment*
Miriam Zintl (TU/LBI Trauma)
- 13:15 *Development of tailored silk-based hydrogels for creating a cartilage-on-a-chip model*
Farzad Elhami Nik (TU)
- 13:20 *Induction of endochondral ossification using acellular generated ROS*
Elias Ellersdorf (TU)
- 13:25 *A novel body-on-a-chip approach to environmental/CBRN neurotoxicity monitoring*
Mateo Vasconez Martinez (TU)

13:30 **Lunch break**

Keynote Lecture

Chair: Sylvia Nürnberger (MedUni)

- 14:30 Microfabrication-based engineering of biomimetic dentin to study dental caries
Ass. Prof. Dr. Sebastian Aguayo, DDS, PhD (Pontifical Catholic University of Chile)

Invited talk

Chair: Sylvia Nürnberger (MedUni)

- 15:10 Photodynamic therapy for cancer treatment and infection control
Peter Dungal (LBI Trauma)

15:30 **Coffee break**

Session V

Chair: Aleksandr Ovsianikov (TU)

16:10 Hydrophobic micropatterned surfaces, 2-photon-polymerization printer,
improved hemocompatibility properties

Marta Bonora (MedUni)

16:15 Microtopography on polycaprolactone: influence on wettability and cell
interaction

Matthias Vostatek (MedUni)

16:30 On the versatility of biomedical applications using two-photon
polymerization

Julia Fernández-Pérez (TU)

16:45 Healing mechanisms of small-diameter biodegradable polymer vascular
grafts

Sabrina Rohringer (MedUni)

17:00 Field-derived design for 3d printable ceramic endoprostheses

Eric Kornfellner (MedUni)

17:15 Osteochondral tissue regeneration in vivo via 3D-printed microscaffold
reinforced spheroids OC – in vivo reinforced scaffold spheroids

Oliver Kopinski-Grünwald (TU)

17:30 **Panel discussion**

17:45 **Closing remarks**

18:00 – 19:00

Networking & farewell

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