

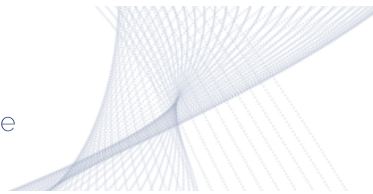
10-Year Anniversary Meeting of the Vienna Center for Engineering in Medicine

ViCEM 2026

November 3-4, 2026

**TU Wien
Prechtlsaal**

Karlsplatz 13, 1040 Wien



November 3, 2026

08:00 **Registration**

09:00 **Welcome addresses**

Christian Hellmich & Sylvia Nürnberger – ViCEM Coordinators

Elisabeth Schludermann – Senior Advisor Research at Vice Rectorate Research, Innovation and International Affairs, TU Wien

Keynote lectures

Chair: Christian Hellmich

09:30 From molecules to tissues: multiscale mechanics of biomaterials for tissue regeneration and disease modeling

Dinesh Katti (North Dakota State University)

10:00 Translational musculoskeletal medicine – consortial research and international coverage

Tobias Winkler (Medical University of Vienna)

10:30 **Coffee break**

Biofabrication & tissue engineering

Chair: Heinz Redl

11:00 Scaffolded-spheroids enable articular cartilage regeneration in vivo in rabbits

O. Kopinski-Grünwald, C. Kamplleitner, L.M. Zopf, P. Heimerl, B. Schädler, J. Ferguson, P. Slezak, A. Ovsianikov

11:15 Delivery of GDF5 to micro scaffolded spheroids as treatment for intervertebral disc degeneration

R.V. Balasubramanian, M. Muerner, S. Schandl, O. Kopinski-Grünwald, S.E. Garcia Joya, J.C. White, S. Grad, **J. Fernández-Pérez**, A. Ovsianikov

11:30 Made to be remodeled: engineering synthetic granular hydrogels for tissue regeneration

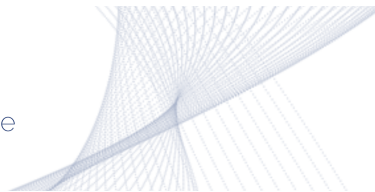
C.M.I. Baltzaki, J. Bushi, J. Fernández-Pérez, S. Baudis

11:45 Hydrogels, implant materials and functional coatings for cartilage repair and joint preservation

R.M. Nothnagel, C. Bauer, L. Vukonic, T. Váradi, F. Franek, M. Rodríguez Ripoll, S. Nehrer

12:00 Leoligin inspired synthetic lignans with selectivity for cell-type and bioactivity, relevant for cardiovascular disease

T. Linder, M.D. Mihovilovic, **M. Schnürch**



Rapid-Fire I – Tissue engineering & cellular biophysics

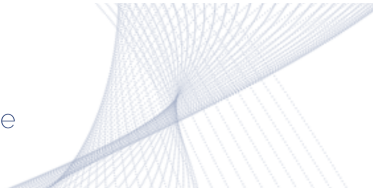
Chair: Heinz Redl

- 12:15 Rapid-fire speaker line-up & introduction by chair
- 12:20 Printsicles – 3D printed hydrogel implants functionalized with EVs for cartilage repair
I-1
M. Rothhammer, K. Kramer, J. Fritz, A. Otahal, S. Nehrer, A. De Luna
- 12:23 Biofunctionalized GelMA-based hydrogels for osteochondral tissue engineering towards mosaicplasty applications
I-2
S. Roffeis, C. Bauer, A. Otahal, R.M. Nothnagel, S. Nehrer
- 12:26 From resin to regeneration: photocurable composites for bone scaffolds
I-3
M. Petkovic, T. Gurmann, L. Sinawehl, T. Koch, R. Liska, S. Baudis
- 12:29 New primers for bone adhesives
I-4
N. Wildhack, D. Bogdanovic, S. Nistler, S. Baudis
- 12:32 Identification and localisation of additional phases in HA/TCP multi-material bioceramics using electron backscatter diffraction
I-5
S. Nistler, T. Wojcik, S. Baudis, M. Schwentenwein, J. Stampfl
- 12:35 A closer look at the dynamics of T cell receptor microclusters
I-6
N. Rajendran, G.J. Schütz
- 12:38 Designing synthetic antigen-presenting cells to determine the 3D nanoenvironment of T-cell antigen recognition
I-7
J. Kloimwieder, S. Bingel, B.A. Hauleitner, S. Baudis, E. Sevcsik
- 12:41 Bioprinting of a 3D immunogenic skin model
I-8
A. Ulloa-Fernández, M. Markovic, L. Kleissl, G. Stary, A. Ovsianikov, J. Fernández-Pérez
- 12:44 **Lunch break & poster discussion**

Biomaterials & chemical biology

Chair: Martina Marchetti-Deschmann

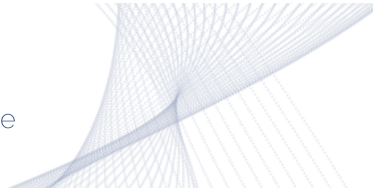
- 14:00 Employing natural compound lead structures in chemical biology
M.D. Mihovilovic
- 14:15 Cellular responses to fiber-reinforced 3D-printed biomaterials for craniofacial bone replacement
C. Winter, P. Schlossgangl, A. Ovsianikov, I. Giouroudi, M. Raith, I. Swoboda
- 14:30 Additive manufacturing of glass fiber-reinforced composites for patient-specific medical devices
F. Hager, D. Laa, J. Bornemann, J. Stampfl
- 14:45 The bioactivity of spider silk lies in its protein core
A. Naghilou, D. Öztürk, S. Wilfinger, S. Rihl, C. Radtke
- 15:00 Toward safer light chemistry: aqueous, two-photon initiators for biofabrication
T. Schmidt, M. Markovic, G. Hufnagl, R. Liska, S. Baudis, A. Ovsianikov



Rapid-Fire II – Bone and brain biomechanics & photomedicine

Chair: Martina Marchetti-Deschmann

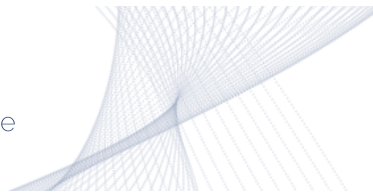
- 15:15 Rapid-fire speaker line-up & introduction by chair
- 15:20 Temporal changes of femoral fracture loads in patients with metastatic bone
II-1 disease: a retrospective longitudinal study using FE models
L. Langhirt, J. Alphonsus, D. Pahr, E. Benca, A. Synek
- 15:23 Tailoring in vitro femoral loading for region-specific physiological accuracy:
II-2 FE-based fitting and reorientation
F. Groß, D.H. Pahr, P.J. Thurner, A. Synek
- 15:26 Damage in cortical bone induced by screw insertion and pull-out
II-3 **S. Saeidi**, M. Petrovic, A. Synek, D. Pahr
- 15:29 AFM force spectroscopy of osteopontin – towards a better understanding of
II-4 bone cement line toughness
M. Fuchs, B.S. Christensen, E.S. Sørensen, M. Wurmshuber, P.J. Thurner
- 15:32 Additively manufactured patient-specific trabecular bone imitations in
II-5 anatomical bone models for preoperative planning and surgical training: a manufacturing framework
M. Pestel, G. Hobusch, J. Alphonsus, G. Wollner, M. Willegger, A. Strassl, I.-M. Nöbauer-Huhmann, R. Windhager, M. Lackner, E. Benca
- 15:35 Automated large-scale brain FE-model generation enables AI training for brain
II-6 shift prediction
S. Bachmann, Y.-R. Chiang, D.H. Pahr
- 15:38 User-specific torque assistance in a passive shoulder exoskeleton using
II-7 customized cam profiles
G. Aronis, A. Lerchster, A. Pohn, T. Angeli, M. Gföhler
- 15:41 Hypericin-PVP photodynamic therapy as a treatment for UV-induced
II-8 cutaneous squamous cell carcinoma
J. Mitterbauer, M. Metzger, D. Fuchs, V. Geyik, A. Szelegowitz, A. Kubin, L. Wightman, P. Dungal
- 15:43 PhotoBone: shining a light on the benefits of photobiomodulation therapy for
II-9 bone healing
M. Arthofer-Lorbeck, P. Dungal, D. Hanetseder, S. Sperger, M. Metzger, C. Schneider, L. Zopf, P. Heimel, J. Flatscher, P. Slezak, A. Gutási, W. Wenninger, K. Schwendt, R. Brunauer
- 15:46 **Coffee break & poster discussion**



Hierarchical mechanics in bioengineering

Chair: Dieter Pahr

- 16:30 Femoral fracture risk assessment in patients with bone metastases: from biomechanical models to machine learning
A. Synek, E. Benca, D. Pahr
- 16:45 Hierarchical elastoplasticity of cortical bone: computational strength predictions based on continuum micromechanics and experimental validation
V. Kumbolder, C. Morin, **S. Scheiner**, C. Hellmich
- 17:00 Modeling brain malformations: from ferrets to FCD II epilepsies
J. Hinrichsen, N. Reiter, M.S. Zarzor, L. Hoffmann, I. Blümcke, F. Paulsen, D. Delev, S. Budday
- 17:15 Studying the elastic behavior of buckyball-shaped microscavolds: computational analysis, stiffness determination and unit-cell based predictions for assemblies
S. Manhartseder, A. Kumar, U. Susec, V. Kumbolder, R.V. Balasubramanian, J. Fernández-Pérez, A. Ovsianikov, C. Hellmich, S. Scheiner
- 17:30 Closed-loop MRI-based focus mapping for validated transcranial ultrasound brain stimulation
C. Windischberger, S. Arnold, C. Evans, Grosshagauer, M. Jaros, H. Hewener, S. Hodono, J. Kielmann, A. Schmitgen, B. Sigurdsson, S. Vijayakumar, N. Yadav, T.O. Bergmann, J. Jaros, E. Laistler, E. Martin, D.G. Norris, A. Thielscher, S. Tretbar, L. Verhagen
- 17:45 "Bio-metals": ancient biological materials with nanoindentation size effects – experiments and elements of manifold micromechanics
L. Zelaya-Lainez, F.S. Schuster, S. Manhartseder, **M. Landegger**, K.N. Ikeda, F. Raible, O. Lahayne, S. Scheiner, C. Hellmich
- 18:00 Collagen mechanics from mouse to horse
M. Fuchs, M. Uelner, L. Batte, A. Docaj, F. Groß, M.G. Jones, O.G. Andriotis, G. Schitter, A. Carriero, **P.J. Thurner**
- 18:15 Analytical beam model revealing bone stresses in femur-implant compound structure
L. Pircher, T.A. Grünwald, H.C. Lichtenegger, **C. Hellmich**
- 18:30 **Poster discussion, networking & refreshments**



November 4, 2026

Cardiovascular biomechanics

Chair: Oliver Kimberger

- 08:30 Blood flow in a fibrotic left atrium
Y. Stöcker
- 08:45 Altered microtissue mechanics and cardiac fibroblast activation in hypertrophic cardiomyopathy
*D. Giannopoulos, M. Petrovic, E. Oleinik, R. Coppini, E. Cerbai, M. Schlittler, A. Rossini, P.J. Thurner, M. De Bortoli, **O.G. Andriotis***
- 09:00 Perivascular adipose tissue as a modulator of vascular graft healing
S. Rohringer, A.-M. Schmitt, C. Grasl, H. Schima, K. Ehrmann, S. Baudis, R. Liska, B.K. Podesser, H. Bergmeister
- 09:15 Advancing valve repair with a bioabsorbable antibacterial magnesium annuloplasty ring: design and long-term ovine outcomes
M. Enayati, L. Weber, J. Horky, M. Fedel, C. Kampleitner, C. Grasl, C. Riedmüller, C. Höchsmann, M. Prückler, S. Braeuer, S. Handschuh, M. Schneider, J. Bekhit, Y. Seo, B. Mora, L. Sajti, M. Bammer, I. Walter, M. Glösmann, G. Koellensperger, S. Tangl, H. Bergmeister, B.K. Podesser

Rapid-Fire III – Cardiovascular devices, flow & neuromodulation

Chair: Oliver Kimberger

- 09:30 Rapid-fire speaker line-up & introduction by chair
- 09:35 III-1 Establishment of a novel and structure preserving decellularization method for off-the-shelf vessels usable in cardiac surgery
T. Ruthmeier, E. Eichmair, C. Nebert, F. Wittmann, E. Benca, T. Dornyi, U. Windberger, A.-M. Kramer, P. Pilz, T. Schuetz, I. Neacsu, J. Ferguson, B. Podesser, D. Zimpfer, B. Messner
- 09:38 III-2 Optimal speed control of an LVAD
R. Lagler, P. Eichmeir, D. Zimpfer, S. Jakubek, M. Granegger
- 09:41 III-3 A numerical framework for virtual trials in pediatric heart failure: a proof-of-concept study
P. Luger, M. El-Shaer, F. Eckert, A. Wisniewski, S. Jakubek, D. Zimpfer, M. Granegger
- 09:44 III-4 Patient-derived simulations of blood flow in the left heart
M. Reiter, Y. Stöcker, E. Durán, M. García-Villalba
- 09:47 III-5 The role of perivascular adipose tissue in the integration of biodegradable thermoplastic polyurethane vascular grafts
A.-M. Schmitt, S. Rohringer, S.J. Specht, S. Topcu, C. Grasl, H. Schima, M. Prückler, I. Walter, B.K. Podesser, H. Bergmeister
- 09:50 III-6 Prediction of cardiac cycle duration for cardiac-gated closed-loop auricular vagus nerve stimulation
D. Chowdhury, K. Schuh, E. Kaniusas
- 09:53 III-7 Establishment of in vitro dermal open flow microperfusion (dOFM) in 3D skin equivalents
V. Geyik, L. Henn, P. Heimel, M. Metzger, J. Mitterbauer, L. Huber, D. Fuchs, H. Redl, P. Dungal

09:57 **Coffee break & poster discussion**

Organ-on-a-chip, in-vitro models & bioelectronics

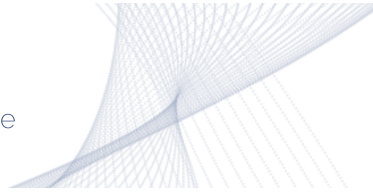
Chair: Philipp Thurner

- 10:30 Lab-on-a-chip systems: are we getting there? Or is it still just a chip in a lab...
M. Rothbauer
- 10:45 A modular sensor-integrated organ-on-a-chip platform for blood-brain barrier-brain organoid integration in Parkinson's disease
S. Schweinitzer, C. Rausch, S. Schobesberger, J. Schwamborn, M. Frauenlob, S. Spitz, P. Ertl
- 11:00 Human-derived photopolymerizable hydrogels for bioinspired gut-on-a-chip platforms
A. Lorenz, I.A. Deus, S. Schobesberger, P. Ertl, M. Frauenlob, C.A. Custódio, J.F. Mano
- 11:15 Comparative spatial lipidomics of human skin and 3D skin equivalents
S. Zoratto, C. Kremslehner, M. Schirato, C. Bauer, M. Mildner, G. Gendronneau, A. Tessier, F. Gruber, M. Marchetti-Deschmann
- 11:30 Computational bioelectronics: bridging neural recording, stimulation and predictive models across scales
P. Werginz

Rapid-Fire IV – Organ-on-a-chip, microfluidics & cell-based models

Chair: Philipp Thurner

- 11:45 Rapid-fire speaker line-up & introduction by chair
- 11:50 Sensor-integrated body-on-a-chip platform for modern, animal-free toxicology
IV-1 **M.G. Vasconez Martinez**, M. Rothbauer
- 11:53 Mechanoinflammatory modulation of gut-derived LPS responses in a human
IV-2 synovial biochip
E.I. Reihs, M. Frauenlob, M.G. Vasconez Martinez, A. Stoiber, S. Toegel, M. Rothbauer
- 11:57 Photoresponsive hydrogels for mechanic stimulation in ligament cell-on-chip
IV-3 applications
J. Heidenberger, J. Zlatnik, V. Tokarova, I. Rehor, J. Dostalek, J. Alphonsus, R. Windhager, S. Toegel, M. Rothbauer
- 12:00 Advancing rheumatoid arthritis research with a biomechanical synovium-on-a-
IV-4 chip model
P. Liskova, E.I. Reihs, H. Kiener, S. Hayer, P. Ertl, R. Windhager, S. Toegel, M. Rothbauer
- 12:03 Cell based models for investigating intestinal epithelial barrier function in celiac
IV-5 disease
A. Kardash, H. Thumfart, S. Schobesberger, S. D'Amico, P. Ertl
- 12:06 Development of a microfluidic device for rapid detection of bacterial infections
IV-6 and antibiotic resistances
N. Eger, M. Baumschabl, M. Schimpf, S. Schobesberger, M. Frauenlob, D. Mattanovich, P. Ertl
- 12:09 Assessment of Bio-Med Clear resin for in-vitro cell culture under flow
IV-7 conditions
V. Viola, S. Fülöp, M. Gföhler, T. Czerny



12:12 Multi-luciferase assays for medical device research
IV-8 **S. Fülöp**, T. Eberhart, E. Riegel, I. Giouroudi, T. Czerny

12:15 **Lunch break & poster discussion**

Computational fluid dynamics, medical devices & clinical translation

Chair: Harald Sima

- 13:30 Pendelluft during mechanical ventilation: experimental and numerical investigations
S. Baghaei Oskouei, V. Viola, C. Jordan, A. Aloy, M. Harasek, M. Gföhler
- 13:45 Alternative membrane architectures for ECMO: from structured fibers to TPMS
J.J. Xu, S.B. Oskouei, C. Jordan, M. Harasek, M. Gföhler
- 14:00 A coupled CFD-FEM framework for modeling heterogeneous wall thickness, stiffness, and wall strain in intracranial aneurysms: a feasibility study
K. Hirtner, P. Aigner, L. Civilla, P. Dodier, F. Moscato
- 14:15 Photodynamic inactivation in the upper airways guided by computational fluid dynamics
F. Mangani, G. Guevara Rojas, F. Zonta, A. Soldati, K.A. Schicho
- 14:30 Femoral stability after cephalomedullary nail removal
G. Schwarz, L. Hirtler, A. Synek, D. Pahr, A. Reisinger, P. Heimel, J. Hofstaetter, S. Nürnberger
- 14:45 "The orthopedic surgeon's wish list: where technology still falls short in 2026"
(Prospective Talk)
L. Pichler

15:00 **Coffee break**

Keynote lectures

Chair: Sylvia Nürnberger

- 15:20 From cells to systems: engineering human cardiac models for functional testing and drug safety
Verena Charwat (Johannes Kepler University Linz)
- 15:50 Assessing the risk of thrombogenesis in the left atrium using patient-derived simulations
Manuel García-Villalba (TU Wien)
- 16:20 **Closing remarks**