

HELMHOLTZ-SYMPOSIUM AACHEN 2019
ON BIOMEDICAL ENGINEERING AND RELATED FIELDS
FRIDAY JUNE 14, 2019

LOCATION:

UNIKLINIK RWTH AACHEN, PAUWELSSTRASSE 30, AACHEN, GERMANY

- Registration:	Foyer Uniklinik RWTH Aachen
- All lectures:	Lecture Hall 6
- Poster Exhibition Area, Coffee Break, Lunch Break & Get Together:	Seminar Room, Ground Floor / Corridor D/46 / Room 04

PROGRAM

8:15 - 9:00 ON-SITE REGISTRATION AND WELCOME

9:00 – 9:30 SESSION I – BIOINTERFACE:

Host: Prof. Dr. rer. nat. Wilhelm Jahnen-Dechent

Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

DIVISION OF TRANSLATIONAL RESEARCH AT CTC-A - FROM THE IDEA TO FIRST-IN-PATIENT (10 MIN. INCL. DISCUSSION)

Karola Thews

Center for Translational & Clinical Research Aachen CTC-A, Uniklinik RWTH Aachen

FABRICATION OF THREE-DIMENSIONAL MEMBRANES FOR ARTIFICIAL LUNGS (20 MIN. INCL. DISCUSSION)

Patrick Bongartz

Chemical Process Engineering AVT.CVT and DWI – Leibniz Institute for Interactive Materials, RWTH Aachen University

9:30 – 10:00 SESSION II – MEDITEC

Host: Prof. Dr. Ing. Klaus Radermacher

Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

ADDITIVE MANUFACTURING IN BIOMEDICAL ENGINEERING (20 MIN. INCL. DISCUSSION)

Prof. Dr.-Ing. Dipl. Wirt.-Ing. Johannes Henrich Schleifenbaum,

Digital Additive Production, Fraunhofer-Institute for Lasertechnology ILT, RWTH Aachen University

MORPHO-FUNCTIONAL ANALYSIS OF KNEE IMPLANT DESIGNS - ADDITIVE MANUFACTURING AS AN ENABLING TECHNOLOGY IN RESEARCH (10 MIN. INCL. DISCUSSION)

Prof. Dr.-Ing. Klaus Radermacher

Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

10:00 – 10:30 SESSION III – CELL BIOLOGY

Host: Prof. Dr. rer. nat. Martin Zenke

Institute of Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

THE THIRD DIMENSION IMPACTS ON CELLULAR DIFFERENTIATION – HYDROGELS AFFECT GROWTH AND DIFFERENTIATION OF MESENCHYMAL STROMAL CELLS AND IPSC-DERIVED MSCs (15 MIN.TOTAL INCL. DISCUSSION)

Roman Goetzke, PhD

Division of Stem Cell Biology and Cellular Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

BLOOD COUNTS BASED ON DNA METHYLATION – EPIGENETICS PROVIDE A NEW DIAGNOSTIC APPROACH TO DISCERN LEUKOCYTES (15 MIN.TOTAL INCL. DISCUSSION)

Stephanie Sontag, PhD

Division of Stem Cell Biology and Cellular Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

10:30 – 11:00 SESSION IV – AME

Host: Prof. Dr. Thomas Schmitz-Rode

Chair of Applied Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

TOWARDS AN IMPLANTABLE LUNG (10 MIN.TOTAL INCL. DISCUSSION)

Priv.-Doz.Dr.-Ing. Jutta Arens

Chair of Applied Medical Engineering - Cardiovascular Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

DEVELOPMENT OF A BIOHYBRID LUNG (20 MIN.TOTAL INCL. DISCUSSION)

Dr. Bettina Wiegmann

Department of Cardiothoracic, Transplantation and Vascular Surgery, Hannover Medical School HTTG

11:00 – 11:30 COFFEE BREAK & POSTER SESSION

11:30 – 12:00 SESSION V – BioTEC

Host: Prof. Dr. rer. nat. Lothar Elling

Biomaterials Laboratory, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University FB1

BIOFUNCTIONALIZED MATERIALS - COMBINING POLYMERS AND FUNCTIONAL BIOMOLECULES FOR NEW MATERIALS (30 MIN. INCL. DISCUSSION)

Dr. Ruben R. Rosencrantz

Fraunhofer-Institut für Angewandte Polymerforschung, Potsdam-Golm

12:00 – 12:30 SESSION VI – MEDIT

Host: Prof. Dr. Ing. Dr. med. Steffen Leonhardt

Chair of Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

METHODEN ZUR KONTAKTFREIEN MESSUNG VON VITALPARAMETERN FÜR AUTOMOBILE ANWENDUNGEN (15 MIN. INCL. DISCUSSION)

Dr.-Ing. Christoph Hoog Antink

Chair of Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

POTENTIAL UND NUTZEN EINES KONTAKTFREIEN MONITORINGS AUF DER NICU (15 MIN. INCL. DISCUSSION)

Prof. Dr. med. Thorsten Orlikowsky

Department of Neonatology, University Childrens Hospital, Uniklinik RWTH Aachen

12:30 – 13:00 SESSION VII – ExMi

Host: Prof. Dr. med. Fabian Kiessling

Institute of Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

FRAUNHOFER MEVIS AND THE DEVELOPMENT OF HARM-FREE PERFUSION MEASUREMENT USING ARTERIAL SPIN LABELING (30 MIN.TOTAL INCL. DISCUSSION)

Prof. Dr. Matthias Günther

Fraunhofer Institute for Digital Medicine MEVIS, Bremen

13:00 – 14:00 LUNCH BREAK & POSTER SESSION

14:00 – 15:00 POSTER SESSION 1-MINUTE TEASERS

15:00 POSTER SESSION INFORMAL PART, DISCUSSION & GET TOGETHER WITH REFRESHMENTS

POSTER

	Titel	Authors	Institution
1	A new approach towards the development of 3 D skin models for psoriasis	Smriti Singh, Yvonne Marquardt, Rahul Rimal, Akihiro Nishiguchi, Mitsuru Akashi, Martin Moeller, Jens M. Baron	Department of Dermatology and Allergology, Uniklinik RWTH Aachen
2	Digital Microfluidics for Biosensing Applications	T. Kremers, V. Heine, D. Laaf, L. Elling, U. Schnakenberg	Institute of Materials in Electrical Engineering 1, RWTH Aachen University
3	AutoMock – Development of an automated extracorporeal circuit for kidney perfusion	Christian Bleilevens, Aaron Elliott, Gregor Fabry, Freimut Hammer, Peer-Niklas Menzel, Mateusz Buglowski, Benedict Doorschodt, René Tolba, Rolf Rossaint, André Stollenwerk	Department of Anesthesiology, Uniklinik RWTH Aachen
4	Localizing Fibrinolysis on the Surface of ECMO Membranes by Immobilization of tissue Plasminogen Activator on Antifouling Polymer Brushes	Lena Witzdam, Fabian Obstals, Mariia Vorobii, Smriti Singh, Oliver Grottke, César Rodriguez-Emmenegger	DWI – Leibniz Institute for Interactive Materials, Aachen
5	Hemocompatible Polymer Brushes	Fabian Obstals, Mariia Vorobii, Sarah Dedisch, Felix Jakob, Andres de los Santos Pereira, Tomás Riedel, Oliver Grottke, Ulrich Schwaneberg, Smriti Singh, Cesar Rodriguez-Emmenegger	DWI – Leibniz Institute for Interactive Materials, Aachen
6	When Membranes meet Medicine	Ilka Rose, Suzana Djeljadini, Sarah Klein, Patrick Bongartz, Matthias Wessling	Chemical Process Engineering, Aachener Verfahrenstechnik, RWTH Aachen University
7	Division of Translational Research at CTC-A From the Idea to First-in-Patient	Karola Thews	Translational Research, Uniklinik RWTH Aachen
8	ProcessModelling - Prozessorientiertes Reifungsmodell der biohybriden Herzklappe im Bioreaktor	Dirk Abel, Thomas Schmitz-Rode, Marc van Zandvoort	Institute of Automatic Control, RWTH Aachen University
9	Ready-to-use compliant vascular grafts based on elastin-like recombinamers	Fernández-Colino, Alicia; Wolf, Frederic, Rütten; Stephan; Schmitz-Rode, Thomas, Rodríguez-Cabello, J.Carlos; Jockenhoevel, Stefan; Mela, Petra	Department of Biohybrid & Medical Textiles (BioTex), AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
10	Tissue-Engineered Vascular Grafts as In Vitro Models of Intimal Hyperplasia	Frederic Wolf, Diana M. Rojas-González, Anne Cornelissen, Nicole Schaaps, Thomas Schmitz-Rode, Stefan Jockenhoevel, Felix Vogt, Petra Mela	Department of Biohybrid & Medical Textiles (BioTex), AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
11	Endothelialization of TiO₂- and Ti-45Nb-coated gas exchange membranes for biohybrid lungs	S. Klein, I. Rose, S. Djeljadini, S. Mráz, M. Wessling, J. M. Schneider, S. Jockenhoevel, A. L. Thiebes, C. G. Cornelissen	Department of Biohybrid & Medical Textiles (BioTex), AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
12	In vitro differentiation of respiratory epithelial cells	A.E. Lungen, C. Kniebs, F. Neukamp, M. Buhl, C.G. Cornelissen, S. Jockenhövel, A.L.Thiebes	Department of Biohybrid & Medical Textiles (BioTex), AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
13	3DLung – Three-Dimensional Membrane Structures for Artificial Lungs	F Hesselmann, S Djeljadini, C Cornelissen, M Wessling, J Arens	Department of Cardiovascular Engineering, AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
14	ConnLA & Connex AL Numerical Investigation of the Connection to the Common Iliac Veins for the Long-Term Connection of an ECLA	N. B. Steuer, K. Hugenroth, T. Beck, F. Hima, S. Kalverkamp, J. Spillner, J. Petran, R. Kopp, T. Schmitz-Rode, U. Steinseifer, G. Wagner, J. Arens	Department of Cardiovascular Engineering, AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University
15	Extracorporeal carbon monoxide removal as emergency therapy for CO-Intoxications Idea and first in-vitro results	N. Steuer, P. Schlanstein, A. Hannig, T. Schmitz-Rode, U. Steinseifer, J. Arens	Department of Cardiovascular Engineering, AME - Institute of Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University

	Titel	Authors	Institution
16	Recent Advances in Electrical Impedance Tomography	Benjamin Hentze, Tobias Menden, Steffen Leonhardt	Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
17	Hybrid use of cameras for vital sign assessment	Michael Paul, Stephan Dahlmanns, Simon Lyra, Xinchu Yu, Cornelius Bollheimer, Thorsten Orlikowsky, Steffen Leonhardt, Christoph Hoog Antink	Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
18	Physiological Closed-Loop Ventilation	Philip van Platen, Anake Pomprapa, Steffen Leonhardt	Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
19	Lower Limb Exoskeleton for Rehabilitation and Motion Support	Chuong Ngo, Bernhard Penzlin, Lukas Bergmann Markus Lüken, Steffen Leonhardt	Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
20	Instrumentation of a Test Vehicle for Unobtrusive	Pascal Vetter, Christoph Weiss, Lennart Leicht, Steffen Leonhardt	Medical Information Technology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
21	In vitro Synthesis of Hyaluronic Acid by Optimisation of Enzyme Cascades	Johannes Gottschalk, Anna Eisele and Lothar Elling	Laboratory of Biomaterials, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
22	Substrate Spectrum of a Hyperthermophilic β-Glycosidase from <i>Pyrococcus woesei</i>	M. Hoffmann, A. Grochla, L. Elling	Laboratory of Biomaterials, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
23	Glycan-functionalized microgels for bacterial toxin scavenging	Viktoria Heine, Sarah Boesveld, Alexander Jans, Gernot Sellge, Pavel Strnad, Christian Trautwein, Alexander Kühne, Martin Möller, Lothar Elling	Laboratory of Biomaterials, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
24	Cellular Clearance and Biological Activity of Calciprotein Particles Depend on their Maturation State and Crystallinity	Sina Köppert, Andrea Büscher, Anne Babler, Ahmed Ghallab, Eva Miriam Buhl, Eicke Latz, Jan G. Hengstler, Edward R. Smith, Willi Jahnen-Dechent	Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
25	Cellular Calcification Mechanisms triggered by Blood-borne Particles and their Role in CKD	Andrea Büscher, Hiltrud König, Stephan Rütten, Willi Jahnen-Dechent	Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
26	Quality control of mammalian oocytes based on nanoindentation and electrical impedance spectroscopy	Julia Floehr, Carlo Schmitz, Zeynab Sadr, Eileen Dietzel, Akram El Hasni, Hagen Körschgen, Michael Kuske, Walter Stöcker, Anna Cuppari, Xaver Gomis-Rüth, Uwe Schnakenberg, Willi Jahnen-Dechent	Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
27	A novel fetuin-A-based fusion protein generates functional human osteoclasts in vitro	Robert Dzhanaev, Nina Petrova, Andrea Büscher, Carlo Schmitz, Cathy Shanahan, Willi Jahnen-Dechent	Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
28	Calciprotein Particles: Background, Detection and Analysis	Steffen Gräber, Andrea Büscher, Sina Köppert, Andreas Pasch, Willi Jahnen-Dechent	Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
29	Functional fibrin-based hydrogels for controlling cell/biomaterial interactions in biohybrid implants	Hanna Malyaran, Svenja Wein, Norina Labude, Sabine Neuss-Stein	Institute of Pathology, Cell and Molecular Biology at Interfaces, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
30	The Functional Relevance of DNMT3A Splice Variants in Hematopoietic Differentiation	Tanja Božić, Joana Frobel, Annamarija Raić, Fabio Ticconi, Stefanie Heilmann-Heimbach, Tamme W. Goecke, Ivan G. Costa, Edgar Jost, Wolfgang Wagner	Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
31	Differentiation of Induced Pluripotent Stem Cells into Mesenchymal Stromal Cells is Supported by Soft Hydrogels	Roman Goetzke, Julia Franzen, Hans Keijndener, Alina Ostrowska, Michael Vogt, Andreas Blaeser, Gerd Klein, Björn Rath, Petra Mela, Horst Fischer, Martin Zenke, Wolfgang Wagner	Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University

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32	Inducible HoxB8 MPPs for CRISPR/Cas9 Mediated Knockout Studies	Thomas Look, Katrin Götz, Sujeethkumar Prithiviraj, Daniel Lennartz, Manuel Delgado Cáceres, Rafael Kramann, Kristin Seré, Martin Zenke	Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
33	Genome Editing in Dendritic Cells Using CRISPR-Cas9 Knockin Mice	Henning Schurse, Rafael Kramann, Martin Zenke, Kristin Seré	Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
34	Human Induced Pluripotent Stem Cells with KIT D816V Mutation for Modeling Myeloproliferative Neoplasms (MPN)	Marcelo A. S. Toledo, Malrun Gatz, Stephanie Sontag, Karoline Gleixner, Steffen Koschmieder, Peter Valent, Tim Brümmendorf, Nicolas Chatain, Martin Zenke	Cell Biology, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
35	Theranostic polymeric micelles loaded with paclitaxel for image - guided anticancer therapy	Ilaria Biancacci, Benjamin Theel, Yang Shi, Federica De Lorenzi, Maike Baues, Fabian Kiessling, Wim Hennink, Twan Lammers	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
36	Micro-Computed Tomography of a murine non-alcoholic fatty liver disease model with liver-specific knockout of the mTOR pathway	Diana Möckel, Andreas Kroh, Jeanette Walter, Thorsten Cramer, Ulf Peter Neumann, Twan Lammers	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
37	A DOI-encoding, Time-of-Flight Capable Detector based on Semi-Monolithic Crystals for Total-Body PET	Florian Müller, David Schug, Michael Hammerath, Christian Gorjaew, Torsten Solf, Volkmar Schulz	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
38	Attenuation correction for a dedicated breast PET-MRI insert based on T₂-weighted multi-slice MRI data: influence of segmentation and interpolation strategy	Teresa Nolte, André Salomon, Laiyin Yin, Volkmar Schulz	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
39	Overview of Multi-Channel Measurements with the PETsys TOFPET2 ASIC	David Schug, Vanessa Nadig, Björn Weissler, Pierre Gebhardt, Volkmar Schulz	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
40	Design and Synthesis of Optical Probes for Biomedical and Super Resolution Imaging Applications	Jean Michel Merkes, Fabian Kiessling, Magnus Ruepingand, Srinivas Banala	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
41	Upgrading a multimodal SPECT-PET-Optical-CT for integrated fluorescence tomography	Felix Gremse, Stephan Blazis, Ruud Ramakers, Sofia Koustoulidou, Chao Wu, Yutaro Takahashi, Fabian Kiessling, Staf van Cauter, Freek Beekman	Experimental Molecular Imaging, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
42	Biomechanical Modelling and Simulation	M. Asseln, A. Benninghaus, M. Fischer, S. Grothues, J. Habor, B. Hohlmann, M. Verjans, K. Radermacher	Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
43	Image and Model Guided Surgery	J. Habor, S. Drobinsky, M. de la Fuente, M. Fischer, J. Heibeyn, B. Hohlmann, P. Schleer, M. Strake, M. Vossel, K. Radermacher	Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
44	Integration, Usability and Risk Engineering	A. Janß, J. Heibeyn, P. Krumholz, M. Strake, P. Schleer, K. Radermacher	Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
45	Mechatronics and Robotics	M. Verjans, S. Drobinsky, M. de la Fuente, J. Heibeyn, P. Schleer, L. Theisgen, M. Vossel, K. Radermacher	Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University
46	Ultrasound and Shockwaves	M. de la Fuente, K. Dietz-Laursonn, J. Habor, B. Hohlmann, N. Reinhardt, K. Radermacher	Chair of Medical Engineering, Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University