

12th

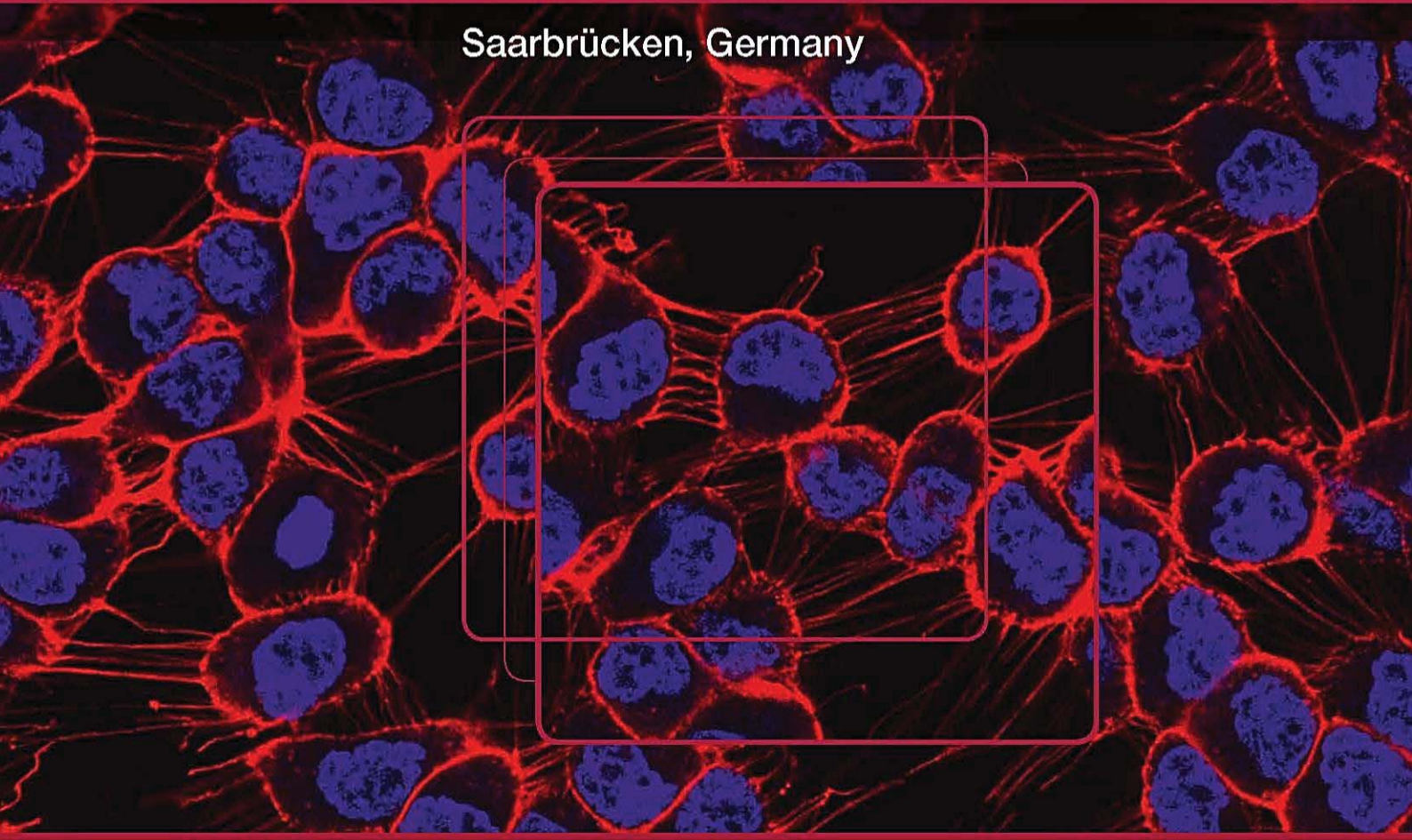
International Conference and Workshop on

BIOLOGICAL BARRIERS

Helmholtz-Institute for Pharmaceutical
Research Saarland and Saarland University

27-29 August 2018

Saarbrücken, Germany



PROGRAMME CHAIRS AND ORGANISERS

Prof. Dr. Claus-Michael Lehr

Dr. Nicole Schneider-Daum

Dr. Brigitta Loretz

Dr. Gregor Fuhrmann

Helmholtz-Institut für Pharmazeutische Forschung Saarland

 HELMHOLTZ
ZENTRUM FÜR
INFEKTIONSFORSCHUNG

 UNIVERSITÄT
DES
SAARLANDES

Monday, 27 August 2018

8:00 *Registration open – coffee and snacks for early birds*

9:00 OPENING CEREMONY

Martina Sester

Vice President of Saarland University
Welcome address

Stephan Kolling

State Secretary of Saarland
Welcome address

Claus-Michael Lehr

HIPS - Helmholtz Institute for Pharmaceutical Research Saarland, Saarbruecken, Germany
Brief Introduction to HIPS and HZI - Helmholtz Center for Infection Research

Modelling Biological Barriers

10:00 **Heike Walles**

TERM, University Hospital Würzburg, Germany
Complex human co-culture tissue models and their application in drug development

10:30 **Pankaj Karande**

Rensselaer Polytechnic Institute, New York, USA
Fabrication of a full-thickness vascularized human skin using 3D bioprinting

11:00 – 11:30 coffee break and poster walks

Skin Barrier – Session Chair: Brigitta Loretz

11:30 **Maïke Windbergs** * *Guest Speaker of the Galenus Privatstiftung* *

University of Frankfurt, Germany
The human skin in healthy and diseased state – *in vitro* models and imaging approaches

12:00 **Ciarán Fisher**

Certara UK Limited, Sheffield, UK
Modelling distribution using physiologically-based pharmacokinetic models

12:15 **Pierre Volz**

Free University Berlin, Germany
Cluster Fluorescence Lifetime Imaging as a tool to detect oxidative stress and visualize nanocarriers interacting with the skin

12:25 **Manuel Sacha**
Across Barriers, Saarbrücken, Germany
Snake shed skin as *in vitro* percutaneous absorption model for testing transdermal drugs

12:35 **Jonathan R. Brewer**
University of Southern Denmark, Odense, Denmark
The molecular pathway through human skin

12:50 - 13:50 lunch catering

Lung Barrier – Session Chair: Nicole Schneider-Daum

13:50 **Cornelia Sonntag**
Galenus Privatstiftung, Vienna, Austria

14:00 **Katharina Ribbeck** * *Guest Speaker of the Galenus Privatstiftung* *
MIT - Massachusetts Institute of Technology, Boston, USA
Microbial Interactions and Transport in the Mucus Barrier

14:30 **Kwang-Jin Kim**
University of Southern California, Los Angeles, USA
Electrophysiological approaches to characterize epi/endothelial barrier properties

14:50 **Rana Abu-Dahab**
University of Jordan, Amman, Jordan
Development of a co-culture *in vitro* model simulating Cystic Fibrosis lung infected with *Pseudomonas aeruginosa*

15:05 **Maximiliano Gutierrez**
The Francis Crick Institute, London, UK
Crossing barriers to improve tuberculosis treatment

15:35 **David Kessie**
University of Würzburg, Germany
Characterization of Bordetella pertussis virulence mechanisms using engineered human airway models

15:45 **Josué Sznitman** * *Guest Speaker of the Galenus Privatstiftung* *
Israel Institute of Technology, Haifa, Israel
Advanced airway-on-chip platforms: bridging *in vitro* and *in vivo* pulmonary interfaces

16:15 **Nina Hobi**
University of Bern, Switzerland
Organs-on-chip models of the air-blood barrier

16:30 - 17:00 coffee break and poster walks

Nanomedicine/ Nanotoxicology – Sessio Chair: Cristiane de Souza Carvalho-Wodarz

- 17:00 **Tejal Desai**
University of California, San Francisco, USA
Nanostructured Materials for Therapeutic Delivery and Immunomodulation
- 17:30 **Fransisca Leonard**
Houston Methodist Research Institute, USA
Macrophages polarization - emerging target of nanomedicine for inflammatory-related diseases
- 17:45 **Tina Buerki-Thurnherr**
EMPA - Swiss Federal Laboratories for Materials Science and Technology, Switzerland
Nanoparticle uptake and toxicity assessment in a novel standardized human placental organoid model
- 18:00 **Jeroen Bussmann**
Leiden Academic Centre for Drug Research, The Netherlands
Mechanistic insight into nanoparticle-based drug delivery using the zebrafish embryo model
- 18:15 **Claudia Hempt**
EMPA - Swiss Federal Laboratories for Materials Science and Technology, Switzerland
Advanced *in vitro* models of the human intestinal barrier - improvements for nanomaterial translocation studies
- 18:25 **Olga I. Vernaya**
Moscow State University, Russia
Cryochemical synthesis of controlled release systems based on Ag and Cu nanoparticles, antibacterials and biopolymer matrices
- 18:35 **Hamid Ghandehari**
University of Utah, Salt Lake City, USA
Biological Fate and Toxicity of Dendritic and Silica Nanoconstructs
- 19:05 Adjourn

*All attendees of the conference are cordially invited to a reception with food and drinks offered by **Across Barriers** at Science Park Saar*

Tuesday, 28 August 2018

8:00 *Poster walks and coffee & snacks for early birds*

9:00 **Claus-Michael Lehr**
HIPS - Helmholtz Institute for Pharmaceutical Research Saarland, Saarbruecken, Germany
Opening

Drug Delivery

9:05 **André Nel**
University of California, Los Angeles, USA
Use of nanocarriers for chemotherapy delivery and immunotherapy in pancreatic cancer

New Technologies for Overcoming Biological Barriers – Session Chair: Thiyagarajan Durairaj

9:35 **Manuela Banciu**
Babes-Bolyai University, Cluj-Napoca, Romania
Long-circulating liposomal simvastatin inhibits tumor growth via targeting cancer microenvironment-mediated processes

9:50 **Jan Grzelak**
Institut de Ciència de Materials de Barcelona, Spain
Mesoporous silica nanorods as theranostic platforms

10:00 **Alessandro Paolini**
Bambino Gesù Children's Hospital-IRCCS, Rome, Italy
PAMAM dendrimer-functionalized polylactic acid scaffolds as microRNA delivery vehicles in biomedical applications

10:10 **Vincent M. Kadiri**
Max Planck Institute for Intelligent Systems, Stuttgart, Germany
M13 Bacteriophage Constructs for Bioinspired Penetration of the Gastric Mucus Layer

10:20 **Patrick Stayton**
University of Washington, USA
Engineering Intracellular Drug Therapies

10:50 – 11:20 coffee and poster walks

Session Chair: Nicole Schneider-Daum

- 11:20 **Serena Rossi**
Charité-Universitätsmedizin Berlin, Germany
Dendritic polyglycerol sulfates as potential Shh-pathway inhibitors
- 11:30 **Roland Stauber**
University Medical Center of Mainz, Germany
'Small meets smaller': Impact of nanomaterials on microbiota
- 11:50 **Eggehard Holler**
Cedars-Sinai Medical Center, Los Angeles, USA
Biodegradable polymalic acid conjugated to Angiopep-2 and tri-leucine traverses the blood-brain-barrier and distributes
- 12:05 **Chinazom P. Agbo**
University of Nigeria, Nsukka, Nigeria
Development of lipid-based microsuspensions from ophthalmic delivery of Gentamicin
- 12:15 **Peer Fischer**
Max Planck Institute for Intelligent Systems, Stuttgart, Germany
Directed Transport with Nanopropellers

12:45 – 13:45 lunch catering

Vaccine and Skin Delivery – Session Chair: Brigitta Loretz

- 13:45 **Christoph Rademacher**
Max Planck Institute of Colloids and Interfaces, Potsdam, Germany
Small molecule-mediated delivery to human Langerhans cells
- 14:00 **Joanna Rejman**
CureVac AG, Tübingen, Germany
Overcoming extra- and intracellular barriers: polymer-based mRNA delivery systems
- 14:15 **Sebastian Kerski**
University of Wuppertal, Germany
Overcoming the Skin Barrier for Transdermal Delivery of Macromolecules Utilizing Physically Induced Microchannels
- 14:25 **Ian S. Blagbrough**
University of Bath, UK
Innovative materials from electrospun polymeric fibres for the controlled delivery of antibiotics for wound healing of skin infections

14:40 **Camila Nunes Lemos**
Universidade de São Paulo, Brazil
Neurotensin-loaded silk fibroin films associated with iontophoresis as a wound dressing approach

14:50 **Petra O. Nnamani**
University of Nigeria, Nsukka, Nigeria
Gentamicin drug films for topical use

15:00 **Daniel Klinger**
Freie Universität Berlin, Germany
Amphiphilic Nanogels: Tailoring Network Hydrophobicity to Dermal Delivery Applications

15:10 - 15:40 coffee and posters walks

Lung Delivery – Session Chair: Xabier Murgia

15:40 **Jesús Pérez-Gil**
University of Madrid, Spain
Surfing the respiratory surface for smart drug delivery

16:10 **Nathalie Heuzé-Vourc'h**
INSERM, Université de Tours, France
Protective administration of a therapeutic antibody through the airway route in a murine model of acute lung infection

16:25 **Thomas Crouzier**
KTH - Royal Institute of Technology, Stockholm, Sweden
Modulating the barrier properties of mucus

16:45 **Thorben Fischer**
Saarland University, Saarbrücken, Germany
Specific targeting of human macrophages using aspherical microparticles as gene delivery system

16:55 **Frederic Tewes**
INSERM, Université de Poitiers, France
Animal model of chronic lung infection: Are agar and alginate beads interchangeable?

17:10 **Alberto Hidalgo**
Complutense University, Madrid, Spain
Pulmonary surfactant and drug delivery: vehiculation of an anti-inflammatory drug *in vivo*

17:20 **AKM Ashiqul Hague**
University of Tuebingen, Germany
Chemically modified hCFTR mRNAs-Chitosan-coated PLGA recuperate lung function in a mouse model of cystic fibrosis

17:35 – 17:50 coffee and posters walks

Oral Delivery – Session Chair: Claus-Michael Lehr

17:50 **Eva Roblegg** * *Guest Speaker of the Galenus Privatstiftung* *
University of Graz, Austria
Drug Delivery Strategies for Treatment of Oral Diseases

18:20 **Dina Kottke**
Heinrich-Heine University Dusseldorf, Germany
ex vivo permeation studies to facilitate the development of a buccal child-appropriate dosage form by using lidocaine

18:30 **Pavel Gershkovich**
University of Nottingham, UK
Intestinal lymphatic system: Important compartment of drug delivery

18:45 **David Brayden**
University College Dublin, Ireland
Progress using nanoparticulates and permeation enhancers to deliver oral peptides

19:15 Adjourn

***All attendees of the conference are cordially invited
to the conference summer buffet dinner!***

Wednesday, 28 August 2018 – morning session

8:00 Poster walks and coffee & snacks for early birds

Extracellular Vesicles

Session Chair: Gregor Fuhrmann

9:00 **Gregor Fuhrmann**
HIPS - Helmholtz Institute for Pharmaceutical Research Saarland, Saarbruecken, Germany
Introduction to Extracellular Vesicles

9:10 **David Carter**
Oxford Brookes University, UK
The role of extracellular vesicles in stress response

9:40 **Mario Gimona**
Paracelsus Medical University Salzburg, Austria
Manufacturing and regulatory aspects for EVs to reach the clinic

10:10 **Eilien Schulz**
HIPS - Helmholtz Institute for Pharmaceutical Research Saarland, Saarbruecken, Germany
Myxobacteria derived outer membrane vesicles as a novel anti-infectious therapy

10:20 **Sarah A. Blackburn**
University of Kent, UK
Identification of outer membrane vesicle protein targets for use in drug delivery and vaccines

10:30 **Christian Wölk**
Martin Luther University Halle Wittenberg, Germany
Giant plasma membrane vesicles: a model to study passive interactions of nanomedicines with the cell surface

10:45 – 11:15 coffee break and poster walks

11:15 **Raymond Schiffelers**
Utrecht University, The Netherlands
Engineering extracellular vesicles

11:45 **Andrea Masotti**
Bambino Gesù Children's Hospital-IRCCS, Rome, Italy
Drug delivery vectors, extracellular vesicles and the Vitruvian man

- 12:00 **Kaisa Rautaniemi**
Tampere University of Technology, Finland
FLIM Reveals Alternative EV-Mediated Cellular Up-take Pathways of Paclitaxel
- 12:10 **Laura Patras**
Babes-Bolyai University, Cluj-Napoca, Romania
Identification of extracellular vesicles surface proteins and their interactors as new targets for nanomedicine and immunotherapy in cancer
- 12:20 **Camille Roesch**
Izon Science, Lyon, France
Combining Size Exclusion Chromatography (SEC) & Tunable Resistive Pulse Sensing (TRPS) technology for the advanced characterization of extracellular vesicles

12:30 – 13:30 lunch catering and poster walks

**13:30 Award Ceremony for "best poster" and "best presentation"
Poster prizes provided by Elsevier and Wiley**

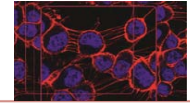
Wednesday, 28 August 2018 – afternoon session

Advanced Nanomedicine to Overcome Biological Barriers
in cooperation with European ITN NABBA, <http://nabbaproject.eu/>

- 13:45 **Francesco Nicotra**
University of Milano-Bicocca, Italy
About ITN NABBA
- 13:55 **Gert Storm**
Utrecht University, The Netherlands
Targeted drug delivery: are our expectations justified?
- 14:25 **Maria-José Alonso**
University of Santiago de Compostela, Spain
Formulation of macromolecules using nanotechnology
- 14:55 **Gianpiero Lazzari**
Institut Galien Paris-Sud, France
Multicellular spheroid based on a triple co-culture: a novel 3D model to mimic pancreatic tumor complexity

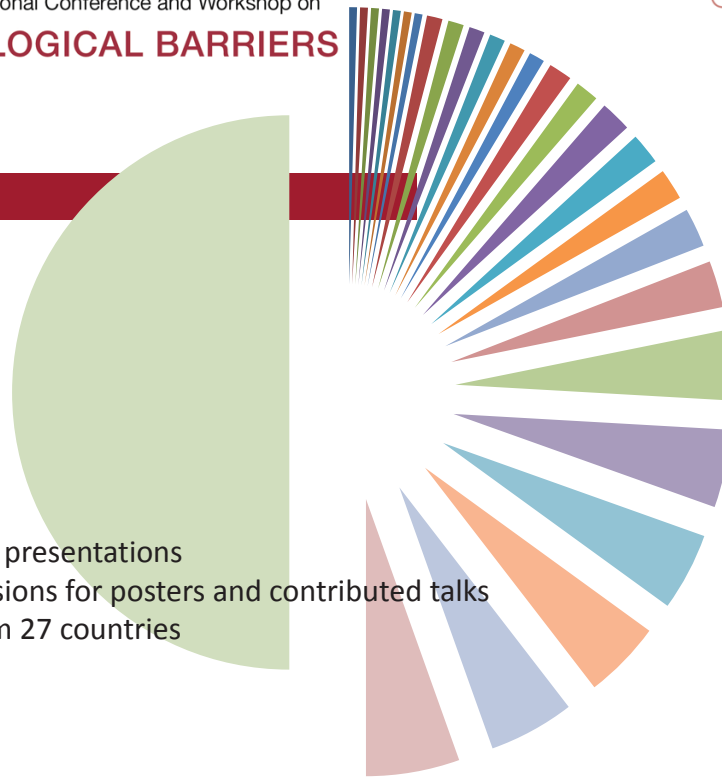
- 15:10 **Tarun Ojha**
Utrecht University, The Netherlands
Priming the tumor blood vessels and the tumor microenvironment with liposomal corticosteroids to improve nanomedicine mediated drug delivery
- 15:25 **Alysia Cox**
University of Milano-Bicocca, Italy
Evolution of the protein corona across the blood-brain barrier
- 15:40 – 16:10 coffee break and poster walks*
- 16:10 **Patrick Couvreur**
CNRS - Centre National de la Recherche Scientifique, France
Advanced nanomedicines for the treatment of cancer and neurological disorders
- 16:40 **Rana Edwards**
University of Milano-Bicocca, Italy
New procedure for liposomes Glyco-functionalization
- 16:55 **Duy Khiet Ho**
HIPS - Helmholtz Institute for Pharmaceutical Research Saarland, Saarbruecken, Germany
Quorum sensing inhibitor and aminoglycoside antibiotic dual-loaded nano-assemblies as complementary therapy against *Pseudomonas aeruginosa* infection
- 17:10 **Sofia Bisso**
ETH Zurich, Switzerland
Calcium phosphate nanoparticles for the dual delivery of bisphosphonates and pDNA
- 17:25 **Jean-Christophe Leroux**
ETH Zurich, Switzerland
Delivery of a liposomal O6-methylguanine-DNA methyltransferase inactivator to glioblastoma via ultrasound-supported blood-brain barrier opening
- 17:55 Closing Remarks, End of Conference

12th International Conference and Workshop on BIOLOGICAL BARRIERS



Facts and Figures

27 invited speakers
45 contributed oral presentations
124 abstract submissions for posters and contributed talks
220 participants from 27 countries



- Taiwan - 1
- Liberia - 1
- Jordan - 1
- Ireland - 1
- Hungary - 1
- Greece - 1
- Czech Rep. - 1
- Sweden - 2
- Russia - 2
- Romania - 2
- Nigeria - 2
- Finland - 2
- Brazil - 2
- Portugal - 3
- Israel - 3
- South Korea - 4
- Belgium - 4
- Austria - 4
- Denmark - 5
- NL - 6
- Spain - 9
- US - 10
- Switzerland - 10
- France - 10
- UK - 11
- Italy - 12
- Germany - 110

We are thankful to our supporters who enable us to bring together people from all over the world and to provide an inspiring environment.

