

9th

International Conference and Workshop on
Biological Barriers –
in vitro and *in silico* Tools
for Drug Delivery and
Nanosafety Research



29 February - 9 March 2012
Saarland University
Saarbrücken, Germany

Programme Chairs and Organisers:
Prof. Dr. Claus-Michael Lehr, Prof. Dr. Ulrich F. Schäfer,
Jun. Prof. Dr. Marc Schneider, Dr. Nicole Daum

<http://www.uni-saarland.de/biobarriers2012>

Helmholtz Institute for Pharmaceutical Research Saarland



nanomedicine and drug delivery day in G
NanoDDS'12

stiftung
europrofession

Wednesday, 29 February 2012

7:30 Registration open

8:30 Relevance of *in vitro* studies for dermatological research
Howard Maibach, University of California, USA

9:00 Welcome address
Volker Linneweber, President of Saarland University

Seminar 1: Skin Barrier

Reaching the Immune System via the Skin: New Vaccines and Adjuvants - Challenges and Opportunities

Chairs: Marc Schneider, Saarland University
Steffi Hansen, Helmholtz Institute for Pharmaceutical Research Saarland

9:15 Transdermal hyposensitization
Thomas Kündig, University Hospital Zurich, Switzerland

9:45 Vaccine delivery and the role of new adjuvants
Carlos Guzman, Helmholtz Centre for Infection Research, Germany
Thomas Ebensen, Helmholtz Centre for Infection Research, Germany

10:15 Vaccine delivery in the skin
Véronique Préat, University of Leuven, Belgium

10:45 Preclinical model and clinical application of transcutaneous vaccination
Behazine Combadiere, Sorbonne University, France

11:15 – 11:45 coffee break

Emerging Needs and Models in Skin Delivery

Chairs: Ulrich F. Schäfer, Saarland University
Nicole Daum, Helmholtz Institute for Pharmaceutical Research Saarland

11:45 Models of the normal skin
Bart de Wever, ALTEXA Development, Monaco

12:15 Models of the diseased skin
Hans Christian Korting, LMU, Munich, Germany
Monika Schäfer-Korting, FU Berlin, Germany

12:45 – 14:00 lunch

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Technologies to Overcome the Skin Barrier

Chairs: Ulrich F. Schäfer, Saarland University

Maike Windbergs, Saarland University and PharmBioTec GmbH

14:00 Laser ablation

Yogeshvar Kalia, University of Geneva, Switzerland

14:30 Follicle targeting

Jürgen Lademann, University Hospital Charité, Berlin, Germany

15:00 Patches

Michael Horstmann, Tesa SE, Hamburg, Germany

15:30 – 16:00 coffee break

Round Table: Skin Lipids – What is state of the art?

Chairs: Claus-Michael Lehr, Saarland University &

Helmholtz Institute for Pharmaceutical Research Saarland

Thomas Vogt, Saarland University Hospital, Germany

16:00 – 18:00

Phil Wertz, University of Iowa, USA

Annett Schröter, University of Halle, Germany

Mila Boncheva, Firmenich SA, Switzerland

Lars Norlén, Karolinska University Hospital, Sweden

Joke Bouwstra, University of Leiden, The Netherlands

18:00 – 20:00 Reception

Poster session and reception with food and drinks

Thursday, 1 March 2012

Seminar 1: Skin Barrier

Nanomedicine for Dermal Applications

Chairs: Ana Melero, Saarland University

Steffi Hansen, Helmholtz Institute for Pharmaceutical Research Saarland

8:30 Photodynamic therapy
Alfred Fahr, Friedrich Schiller University Jena, Germany

Contributed Oral Presentations

9:00 Feasibility of transdermal delivery of lipid based nanocarriers of Huperzine-A
for treatment of Alzheimer disease
Pratikkumar A. Patel, Institute of Chemical Technology, Mumbai, India

9:15 Suitability of different skin integrity tests for dermal penetration studies *in vitro*
Katharina Guth, BASF, Ludwigshafen, Germany

9:30 Design of an advanced physiological buccal *in vitro* model
Birgit J. Teubl, Karl-Franzens University Graz, Austria

9:45 Targeting drug delivery to deep skin layers after topical application
Yuri Dancik, Procter & Gamble, Brussels, Belgium

10:00 Evaluation of the lateral diffusion rates of zinc pyrithione on skin and agar gel
by quantitative radioluminographic imaging
Allison K. Rush, University of Cincinnati, OH, USA

10:15 – 10:45 *coffee break*

Analytic and Visualisation Tools

Chairs: Marc Schneider, Saarland University

Maike Windbergs, Saarland University and PharmBioTec GmbH

10:45 Quantifying drug transport and effects by non-invasive imaging
Michael S. Roberts, University of Queensland, Australia

11:15 Multiphoton imaging, CARS and Raman
Karsten König, JenLab, Jena & Saarland University, Germany

11:45 – 13:00 *group photo and lunch*

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13:00 Electron Spin Resonance at the skin barrier
Martina Meinke, University Hospital Charité, Berlin, Germany

13:30 Optical diagnoses of skin diseases
Marica Ericson, University of Gothenburg, Sweden

14:00 Poster prize award session

14:15 Closing remarks
Claus-Michael Lehr, Saarland University &
Helmholtz Institute for Pharmaceutical Research Saarland

Thursday, 1 March 2012 (14:30 – 18:30)

Friday, 2 March 2012 (8:00 – 18:00)

LabCourse 1: Skin Barrier

Only for registered participants of LabCourse 1

Participants will be assigned to three rotating groups at their registration!

Module 1: Skin absorption experiments

- a) Skin preparation and permeation experiments**
- b) Skin segmentation and penetration experiments**

Module 2: *in vitro* skin imaging

- a) Raman-CLSM**
- b) Multiphoton-LSM (Particle Penetration and Analysis)**

Module 3: *in vivo* skin imaging

This module is organized in cooperation with [JenLab GmbH](#) using respective imaging techniques from the company such as the MPTflex®.

Saturday, 3 March 2012

Complementary Training

ELSEVIER Workshop

- 9:00 – 9:40 Through a Journal Editor's bleary eyes:
Thoughts on scientific writing
Alexander T. Florence, Editor-in-Chief
International Journal of Pharmaceutics
- 9:50 – 10:30 A day in the life of a publisher
Jaap van Harten, Executive Publisher
ELSEVIER, Amsterdam, The Netherlands
- 10:30 – 10:45 *coffee break*
- 10:45 – 11:15 Plagiarism detection: How, and is it effective?
Catriona Fennell, Director Journal Services
ELSEVIER, Amsterdam, The Netherlands

IP and Patents

- 11:15 – 12:15 Patents and patent search
Axel Koch, Patent Marketing Agency of Saarland University

Sunday, 4 March 2012

Excursion to the Völklinger Hütte

<http://www.voelklinger-huette.org/en/welcome/>

Monday, 5 March 2012

Seminar 2: Nanomedicine and Nanotoxicology

7:45 Registration open

8:30 Welcome address
Rolf Müller, Helmholtz Institute for Pharmaceutical Research Saarland

Nano-Bio-Technology: Fundamentals and Applications

*Chairs: Gerhard Wenz, Saarland University
Brigitta Loretz, Helmholtz Institute for Pharmaceutical Research Saarland*

8:45 Nano-cell-interactions
Wolfgang Parak, Philipps-University Marburg, Germany

9:15 Signaling pathways to overcome cellular barriers
Roland Brock, Nijmegen Centre for Molecular Life Sciences (NCMLS),
Nijmegen, The Netherlands

9:45 Carbon nanotubes
Kostas Kostarelos, UCL School of Pharmacy, UK

10:15 – 10:45 coffee break

Safety of Nanomaterials

*Chairs: Nicole Daum, Helmholtz Institute for Pharmaceutical Research Saarland
Christine Schulze, Saarland University*

10:45 Nanotoxicology: challenges and pitfalls
Vicki Stone, Heriot-Watt University Edinburgh, UK

11:15 Silver nanoparticles
Carsten Kneuer, Federal Institute for Risk Assessment (BfR), Berlin, Germany

11:45 *Contributed oral presentation*
The response of an *in vitro* human alveolar barrier to SiO₂ nanoparticles
exposure in the presence or absence of THP-1 monocytes
Lucian R. Farcas, European Commission Joint Research Centre, Ispra, Italy

12:00 *Contributed oral presentation*
Binding of transferrin to polystyrene nanoparticles: the memory effect in NP corona
Silvia Milani, LMU, Germany

12:15 The dynamic of the NP-protein corona: Implications for bio-nano response
Roland H. Stauber, University Hospital Mainz, Germany

12:45 – 14:00 lunch

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Microbial and Immunological Barriers

*Chairs: Marc Schneider, Saarland University
Vicki Stone, Heriot-Watt University Edinburgh, UK*

14:00 Bacterial adhesion and invasion strategies
Petra Dersch, Helmholtz Centre for Infection Research, Germany

14:30 Inflamed gut mucosa: a susceptible barrier
Roel Schins, IUF - Leibniz Research Institute for Environmental Medicine,
Düsseldorf, Germany

15:00 Targeting of the inflamed intestinal mucosa: Of Mice and Men
Eva-Maria Collnot, Helmholtz Institute for Pharmaceutical Research Saarland

15:30 – 16:00 *coffee break*

*Chairs: Claus-Michael Lehr, Saarland University &
Helmholtz Institute for Pharmaceutical Research Saarland
Ulrich F. Schäfer, Saarland University*

16:00 Microbial biofilms
Susanne Häußler, Helmholtz Centre for Infection Research, Germany

16:30 Nanotechnology and biofilms in dentistry
Matthias Hannig, Saarland University Hospital, Germany

17:00 Non-viral gene delivery systems
Ernst Wagner, LMU, Munich, Germany

17:30 – 20:00 Reception
Poster session and reception with food and drinks

Tuesday, 6 March 2012

BioBarriers meets Nano DDS

7:30 Bus transfer to the European Academy Otzenhausen
<http://www.eao-otzenhausen.de>

8:45 Welcome

Bionanosensors

*Chairs: Alexander Kabanov, University of Nebraska, Omaha, USA
Claus-Michael Lehr, Saarland University &
Helmholtz Institute for Pharmaceutical Research Saarland*

9:00 Aptameres and other new molecules asking for advanced delivery technologies
Michael Famulok, University of Bonn, Germany

9:30 *Contributed oral presentation*
Construction of a nanobiosensor for in vivo measurements of metabolites in intact cells
Lars F. Olsen, University of Southern Denmark, Odense, Denmark

9:45 Engineering Nanoparticles for Sensing, Delivery and Therapeutic Applications
Vincent M. Rotello, University of Massachusetts, Amherst, USA

10:15 – 10:45 coffee break

Nanomedicine for Cancer Therapy

*Chairs: Hamid Ghandehari, University of Utah, Salt Lake City, USA
Andreas Lendlein, HZG Center for Biomaterial Development,
Teltow, Germany*

10:45 Nanobiopolymers for primary and metastatic cancer treatment
Julia Ljubimova, Cedars-Sinai Medical Center, Los Angeles, USA

11:15 Cancer stem cells specific therapy: Targeted nanomedicine for simultaneous suppression of CD44 protein and cell death induction
Tamara Minko, Rutgers University, New Brunswick, USA

11:45 *Contributed oral presentation*
Ultrasound active immune-lipopolyplexes as a diagnostic and a therapeutic tool
Maria Solovey, Philipps-University Marburg, Germany

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12:00 *Contributed oral presentation*

Novel targeted strategy based on peptide-fragment for advanced drug delivery
against breast cancer stem cells

Ana S. Luis, University of Lisbon, Portugal

12:15 Thermosensitive liposomes for locally triggered delivery

Dieter Haemmerich, Medical University South Carolina, USA

12:45 – 14:00 *group photo and lunch*

Advanced Delivery Technologies

Chairs: Tamara Minko, Rutgers University, New Brunswick, USA

Carolin Thiele, Helmholtz Institute for Pharmaceutical Research Saarland

14:00 Gold nanorod mediated enhanced delivery of polymer -therapeutics

Hamid Ghandehari, University of Utah, Salt Lake City, USA

14:30 Nanomedicines for brain diseases

Alexander Kabanov, University of Nebraska, Omaha, USA

EuroPhD

15:00 *Contributed oral presentation*

Proinflammatory cytokines in the colonic mucosa and their involvement in
protein expression relevant to local drug targeting in IBD

Efrat Harel, The Hebrew University of Jerusalem, Israel, and
Helmholtz Institute for Pharmaceutical Research Saarland

15:15 *Contributed oral presentation*

New *in vitro* method for assessing nanoparticles toxicity by ingestion

Nadia Ucciferri, University of Pisa, Italy, and
Helmholtz Institute for Pharmaceutical Research Saarland

15:30 – 16:00 *coffee break*

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Polymers and Materials for Drug Delivery

Chairs: Marc Schneider, Saarland University

Vincent M. Rotello, University of Massachusetts, Amherst, USA

16:00 Biodegradable nanocapsules for targeting the immune system
Bruno de Geest, Ghent University, Belgium

16:30 Complex polymeric nanocarriers as obtained by miniemulsion techniques
Katharina Landfester, Max Planck Institute for Polymer Research, Mainz,
Germany

17:00 High throughput synthesis and screening of pharmaceutical polymers
Ulrich Schubert, Friedrich Schiller University Jena, Germany

17:30 Biocompatible polymers
Andreas Lendlein, HZG Center for Biomaterial Development, Germany

18:00 Adjourn

18:30 – 21:00 Reception and Conference Dinner

Wednesday, 7 March 2012

Seminar 2: Nanomedicine and Nanotoxicology

Advanced Cell and Tissue Based *in vitro* Models as Alternatives to Animal Testing

*Chairs: Christiane Hohensee, InVitroJobs
Anja Philippi, Korean Institute of Science and Technology, Saarbrücken,
Germany*

8:15 Ethical aspects of animal experiments
Stefanie Schindler, Animalfree Research, Switzerland

8:45 Integrated “quasi-vivo“ models
Arti Ahluwalia, University of Pisa, Italy

9:15 Immortalization strategies for mammalian cells
Dagmar Wirth, Helmholtz Centre for Infection Research, Germany

9:45 – 10:15 coffee break

*Chairs: Robert Bals, Saarland University Hospital, Homburg, Germany
Thomas Tschernig, Saarland University Hospital, Homburg, Germany*

10:15 Modeling the placenta barrier
Peter Wick, Empa, St. Gallen, Switzerland

10:45 Complex models of the air blood barrier
Sabine Fuchs, University of Kiel, Germany

11:15 Macrophage models
Alexandra K. Kiemer, Saarland University, Saarbrücken, Germany

11:45 Human *ex vivo* and *in vitro* models of asthma for the study of allergic airway inflammation
Donna Davies, University of Southampton, UK

12:15 Poster prize award session

12:30 Farewell address
Claus-Michael Lehr, Saarland University &
Helmholtz Institute for Pharmaceutical Research Saarland

12:45 – 14:00 lunch

Wednesday, 7 March 2012 (14:00 – 18:00)

Thursday, 8 March 2012 (8:00 – 18:00)

Friday, 9 March 2012 (8:00 – 12:00)

LabCourse 2: Pharmaceutical Nanomaterials

Only for registered participants of LabCourse 2

Participants will be assigned to four rotating groups at their registration!

Module 1: Preparation of nanoparticles

Module 2: Characterization of nanoparticles

Module 3: Imaging of nanoparticles

Module 4: Drug transport across biological barriers

