

Watching the Lung Work

New methodologies for real-time visualisation of lung function



**The first scientific symposium of the
University of Giessen and Marburg Lung Center School**

**Burg Staufenberg, Hessen, Germany
28th – 29th September, 2010**



LOEWE – Landes-Offensive
zur Entwicklung Wissenschaftlich-
ökonomischer Exzellenz

Tuesday, 28th September 2010

- 8:15 – 08:30** **Welcome** (Harald Renz & Rory E. Morty)
- 08:30 – 10:30** **Imaging salt and water** (Chairs: A. Verkman & B. Grzesik)
- 08:30 – 09:15 ALAN S. VERKMAN (University of California at San Francisco)
Imaging water and ions in the airways
- 09:15 – 10:00 ROBERT TARRAN (University of North Carolina at Chapel Hill)
Measurement of airway surface liquid and mucus transport in human airway cultures
- 10:00 – 10:30 YASMIN BUCHÄCKERT and RAMONA RÜHL (University of Giessen)
Real-time visualisation of transepithelial sodium transport in isolated lungs
- 10:30 – 11:00** **Coffee break**
- 11:00 – 12:30** **Methodology seminars: “How do they work?”** (Chairs: F. Veit & F. Weisel)
- 11:00 – 11:45 DIRK ADRIAENSEN (University of Antwerp)
Introduction to a selection of state-of-the-art microscopy techniques with the potential to watch the lung work
- 11:45 – 12:30 NICOLAU BECKMANN (Novartis, Basel)
Concepts in MRI of the lung: from anatomy to function
- 12:30 – 14:00** **Lunch**
- 14:00 – 16:15** **Imaging lung anatomy and function** (Chairs: D. Adriaensen & E. el-Agha)
- 14:00 – 14:45 PETER KÖNIG (University of Lübeck)
High-speed video and multiphoton microscopy to watch the airways work
- 14:45 – 15:30 DIRK ADRIAENSEN (University of Antwerp)
Molecular confocal live-cell imaging in a whole lung slice model: watching virtually all pulmonary cell and tissue types work
- 15:30 – 16:15 PAUL DIETL (University of Ulm)
Darkfield and fluorescence microscopy for measuring pre-, hemi- and post-fusion stages of lamellar body exocytosis
- 16:15 – 16:45** **Coffee break**
- 16:45 – 19:00** **Imaging infection and inflammation** (Chairs: W. Kübler & N. Kneidinger)
- 16:45 – 17:30 DANIEL KREISEL (Washington University in St. Louis)
Imaging pulmonary immune responses with two-photon microscopy
- 17:30 – 18:15 DAVID ROWLANDS (Novartis, Horsham)
Real-time imaging of inflammatory signalling events in the intact mouse lung
- 18:15 – 19:00 NICOLAU BECKMANN (Novartis, Basel)
A view on imaging in pharmacological research for respiratory diseases
- 19:30** **Dinner for all attendees**

Wednesday, 29th September 2010

08:30 – 10:00 **Advanced applications in clinical imaging** (Chairs: P. Dietl & K. Milger)

08:30 – 09:15 GENEVIÈVE BOURG-HECKLEY (Université Pierre et Marie Curie, Paris)
Autofluorescence microspectro-imaging of bronchi and alveoli during bronchoscopy

09:15 – 10:00 OLIVIER LESUR (University of Sherbrooke)
In vivo endoscopic confocal fluorescence microscopy of the lung: the cutting edge of abyssal travel...without cutting out?

10:00 – 10:30 **Coffee break**

10:30 – 12:00 **Imaging tumours** (Chairs: N. Beckmann & A. Schmall)

10:30 – 11:15 VLADIMIR ERMOLAYEV (German Centre for Environmental Health, Munich)
Towards non-invasive fluorescent imaging for early lung tumour diagnostics

11:15 – 12:00 RAJKUMAR SAVAI (University of Giessen)
Screening lung tumours in mice: comparing novel computed tomography systems

12:00 – 13:30 **Lunch**

13:30 – 15:45 **Cutting-edge technologies** (Chairs: B. Driehuys & L. Wujak)

13:30 – 14:15 WOLFGANG KÜBLER (St. Michaels Hospital, Toronto)
In vivo imaging of ventilation, perfusion and gas exchange at the alveolo-capillary unit of the murine lung

14:15 – 15:00 BASTIAAN DRIEHUYS (Duke University, Durham)
Hyperpolarised gas MRI of pulmonary function: from mouse to human

15:00 – 15:45 DAN HUH (Harvard University)
A human breathing lung-on-a-chip

15:45 **Group Photograph (outside the front entrance)**

16:00 – 17:30 **Applications workshops: “round-table” thematic discussions**

17:30 **Concluding remarks**

18:00 **Dinner for speakers and guests staying overnight**

The symposium webpage is:
www.uni-giessen.de/cms/ugmlc/symposia/watching

The scientific organisers are:
Rory E. Morty, Grażyna Kwapiszewska, Leigh M. Marsh and Werner Seeger
of the University of Giessen and Marburg Lung Center

Contact details for invited speakers

Professor Dirk Adriaensen

Laboratory of Cell Biology and Histology &
Central Core Facility for Biomedical Microscopic
Imaging
Department of Veterinary Sciences
University of Antwerp – Campus Groenenborger
(Room U102)
Groenenborgerlaan 171
BE-2020 Antwerp
BELGIUM
Tel: +32 3 265 3475; Fax: +32 3 265 3301
e-mail: dirk.adriaensen@ua.ac.be

Dr Nicolau Beckmann

Novartis Institutes for BioMedical Research
Head of MRI Laboratory
Novartis Pharma AG
Forum 1 - Novartis Campus
CH-4056 Basel
SWITZERLAND
Tel: +41 61 3249576; Fax: +41 61 3243889
e-mail: nicolau.beckmann@novartis.com

Professor Geneviève Bourg-Heckly

Laboratoire acides nucléiques et biophotonique
Université Pierre et Marie Curie, FRE 3207
Génopôle Campus 1
Site Sereno, RN7
5 rue Henri Desbruères
F-91030 Evry Cedex
FRANCE
Tel: +33 1 6987 4368; Fax: +33 1 6987 4360
e-mail: genevieve.bourg-heckly@upmc.fr

Professor Paul Dietl

Institute of General Physiology
University of Ulm
Albert-Einstein-Allee 11
D-89081 Ulm
GERMANY
Tel: +49 731 5002 3230; Fax: +49 731 5002 3242
e-mail: paul.dietl@uni-ulm.de

Professor Bastiaan Driehuys

Center for In Vivo Microscopy
Box 3302 Duke University Medical Center
Durham, NC 27710
UNITED STATES OF AMERICA
Tel: +1 919 684 7786; Fax: +1 919 684 7122
e-mail: bastiaan.driehuys@duke.edu

Dr Vladimir Ermolayev

Institute for Biological and Medical Imaging
Helmholtz Zentrum München
German Research Center for Environmental
Health (GmbH)
Ingolstaedter Landstrasse 1
D-85764 Neuherberg
GERMANY
Tel: +49 89 3187 1244; Fax: +49 89 3187 3017
e-mail: volodymyr.ermolayev@helmholtz-
muenchen.de

Professor Daniel Kriesel

Department of Surgery
Washington University in St. Louis
Campus Box 8234
660 South Euclid Avenue
St. Louis, MO 63110
UNITED STATES OF AMERICA
Tel: +1 314 362 6021; Fax: +1 314 367 8459
e-mail: kreiseld@wudosis.wustl.edu

Professor Olivier Lesur

Service de pneumologie
Département de médecine
Faculté de médecine et des sciences de la santé
Université de Sherbrooke
3001-12e Avenue Nord
Sherbrooke, Québec J1H 5N4
CANADA
Tel: +1 819 564 5406; Fax: +1 819 564 5377
e-mail: Olivier.Lesur@USherbrooke.ca

Dr Dan Huh

Vascular Biology Program, KFRL 11.127
Children's Hospital Boston
300 Longwood Avenue
Boston, MA 02115-5737
UNITED STATES OF AMERICA
Tel: +1 617-919-2230 Fax: +1 617 730 0230
Email: dan.huh@childrens.harvard.edu

Dr Peter König

Institut für Anatomie
Universität zu Lübeck
Ratzeburger Allee 160 (Haus 63, Raum 207)
23538 Lübeck
GERMANY
Tel: +49 451 500 4022; Fax: +49 451 500 4034
Email: koenig@anat.uni-luebeck.de

Contact details for invited speakers

Professor Wolfgang Kübler

Keenan Research Center
St Michael's Hospital
30 Bond Street
Toronto, Ontario M5B 1W8
CANADA
Tel: +1 416 864 5924; Fax: +1 416 864 5958
e-mail: KueblerW@smh.ca

Dr David Rowlands

Lung Biology Laboratory
Pulmonary, Allergy & Critical Care Medicine
Columbia University
630 West 168th Street, PH 8-101
New York, NY 10032
UNITED STATES OF AMERICA
Tel: +1 212 523 7310; Fax: +1 212 523 8005
e-mail: david.rowlands@novartis.com

Professor Robert Tarran

Cystic Fibrosis/Pulmonary
Research & Treatment Center
7125 Thurston Bowles Bldg.
University of North Carolina
Chapel Hill
NC 27516-7248
UNITED STATES OF AMERICA
Tel: +1 919 966 7052; fax: +1 919 966 5178
e-mail: robert_tarran@med.unc.edu

Professor Alan S. Verkman

Laboratory for Cell & Membrane Biophysics
Departments of Medicine & Physiology,
Cardiovascular Research Institute
University of California-San Francisco
Health Science East Tower (Room 1246)
505 Parnassus Ave
San Francisco, CA 94143-0521
UNITED STATES OF AMERICA
Tel: +1 415 476 8530; fax: +1 415 665 3847
e-mail: alan.verkman@ucsf.edu