

JUNE 21-23, 2017 | HERRENHAUSEN PALACE, HANNOVER, GERMANY

INDIVIDUALIZED INFECTION MEDICINE – THE FUTURE IS NOW

PROGRAM

(all academic titles have been omitted)

Thursday, June 21, 2018

2:00 p.m. Registration

3:30 p.m. **OPENING ADDRESSES**

Henrike Hartmann, Volkswagen Foundation, Germany
Dirk Heinz, Helmholtz Centre for Infection Research, Germany
Michael Manns, Hannover Medical School | Centre for Individualized Infection Medicine, Germany

4:00 p.m. **SESSION I: INDIVIDUALIZED MEDICINE – TODAY AND TOMORROW**

The objective of Session I is to introduce the vision of individualized medicine and summarize today's state-of-the-art. In the keynotes Edward Abrahams and Hagen Pfundner will introduce the concept of individualized medicine and give insights into the industry perspective. We will learn about today's relevance of individualized medicine by Nisar Malek and how artificial intelligence may support medicine by Matthias Loehr. Paul Kellam will highlight the importance of genetics for disease stratification. Finally, Christoph Klein will outline the promise of targeted therapies, followed by an in-depth introduction of adoptive T cell therapy by Tobias Feuchtinger.

Chair: Meike Stiesch, Hannover Medical School, Germany

KEYNOTE

Why personalized medicine matters.

Edward Abrahams, Precision Medicine Coalition, USA

KEYNOTE

*The journey of personalized healthcare into the digital era
- an industry perspective -*

Hagen Pfundner, Roche Pharma AG, Germany

5:10 p.m. Coffee Break

5:30 p.m. **CONTINUATION OF SESSION I**

Chairs: Gesine Hansen, Hannover Medical School, Germany and
Arnold Ganser, Hannover Medical School, Germany

Integrating personalization into clinical medicine

Nisar Malek, University Hospital Tübingen, Germany

Personalized cancer medicine supported by artificial intelligence

J.-Matthias Löhr, Karolinska Institutet, Sweden

Host and pathogen genetics - the potential for disease stratification

Paul Kellam, Kymab Ltd, UK

*Children with genetic defects of the immune system – from
therapeutic orphans to pioneers of targeted therapies*

Christoph Klein, Dr. von Hauner University Children's Hospital,
Germany

Adoptive T-cell therapy

Tobias Feuchtinger, Dr. von Hauner University Children's
Hospital, Germany

7:30 p.m.

POSTER SESSION

and get together at the Conference Venue

Chairs: Jessica Rademacher, Hannover Medical School,
Germany and **Thomas von Hahn**, Hannover Medical School,
Germany

Friday, June 22, 2018

8:00 a.m. Registration

9:00 a.m. **SESSION II: REQUIREMENTS FOR ADVANCING INDIVIDUALIZED MEDICINE**

Session II aims at discussing the requirements in terms of infrastructures, programs and training to facilitate individualized medicine. In his keynote, Otmar Wiestler will give insights into the strategies of the Helmholtz Association to promote individualized medicine through its iMed initiative. The second keynote presented by Keith Stewart will highlight the concept and achievements of Mayo Clinics to bring individualized medicine to bedside. Martin Krönke, chairman of the German Center for Infection Research (DZIF), will finally introduce the key questions, opportunities and also the barriers for individualized vaccinology. In a concluding panel discussion the topic will be further elaborated with the speakers of this session.

Chairs: Christine S. Falk, Hannover Medical School, Germany and **Dirk Heinz**, Helmholtz Centre for Infection Research, Germany

KEYNOTE

Strategies for individualized medicine in Helmholtz biomedical research

Otmar Wiestler, Helmholtz Association, Germany

KEYNOTE

Implementation of clinical genomics

Keith Stewart, Centre for Individualized Medicine, Mayo Clinic, USA

Individualized vaccinology

Martin Krönke, University of Cologne, Germany

10:15 a.m. **PANEL DISCUSSION**

Chair: Ulrich Kalinke, TWINCORE, Centre for Experimental and Clinical Infection Research, Germany

PARTICIPANTS

Martin Krönke, University Hospital Cologne, Germany

Keith Stewart, Mayo Clinic, Centre for Individualized Medicine, USA

Otmar Wiestler, Helmholtz Association, Germany



10:50 a.m. Coffee Break

11:15 a.m. **SESSION III: APPROACHES FOR INDIVIDUAL PREVENTION AND TREATMENT IN INFECTIOUS DISEASES**

Session III will emphasize various aspects that might be important considering individualized infection medicine. In the first part Eric Pamer will highlight in his keynote the importance of the microbiome. Till Strowig will demonstrate the importance of preclinical microbiome models in advancing personalized medicine and Dietmar Pieper will outline personalized treatment options by altering the microbiome.

Chairs: Dirk Schlüter, Otto-von-Guericke University Magdeburg, Germany and **Eric G. Pamer**, Memorial Sloan Kettering Cancer Center, USA

KEYNOTE

The intestinal microbiome: impact on infectious diseases and cancer treatment

Eric G. Pamer, Memorial Sloan Kettering Cancer Center, USA

Role of preclinical microbiome models to advance personalized medicine

Till Strowig, Helmholtz Centre for Infection Research, Germany

Altering the microbiome as personalized treatment option

Dietmar H. Pieper, Helmholtz Centre for Infection Research, Germany

12:30 p.m. Lunch Break and Poster Session

2:30 p.m. **CONTINUATION OF SESSION III**

In the second part of Session III we will learn from Peter Openshaw about the predictability of individual responses to lung infections and the consequences. Beate Kampmann will draw our attention on the specialties of infections in pediatrics and the unused potential of individualized infection medicine and Steven Kern will discuss the problems faced establishing individualized infection medicine also in resource-limited settings.

Chairs: Carlos A. Guzmán, Helmholtz Centre for Infection Research, Germany and **Thomas F. Schulz**, Hannover Medical School, Germany

Individual responses to lung infections: limits of predictability
Peter J.M. Openshaw, Imperial College London, UK

Individualized Medicine in the context of childhood infections and vaccines
Beate Kampmann, Imperial College London, UK

Precision public health for infectious disease in low and middle income countries. One size does not fit all.
Steven Kern, Bill and Melinda Gates Foundation, USA

3:45 p.m.

SESSION IV: DIAGNOSTICS FOR INDIVIDUALIZED INFECTION MEDICINE

Session IV will highlight the importance of diagnostics as basis for individualized infection medicine. In the keynote of Christopher Woods we will learn about host-based diagnostics and recent advances in the field of infectious diseases. Susanne Häußler will share her vision of future diagnostics of *Pseudomonas aeruginosa*, especially the prediction of resistances. Alice McHardy will further elaborate on this topic and give insights into the bioinformatics behind.

Chairs: Ulrike Köhl, University of Leipzig, Germany and **Christopher Woods**, Duke University, USA

KEYNOTE

Harnessing the host response for real-time decision making in infectious diseases

Christopher Woods, Duke University, USA

*Towards individualized diagnosis of *Pseudomonas aeruginosa* infections*

Susanne Häußler, TWINCORE, Centre for Experimental and Clinical Infection Research, Germany

Inference of genotype-phenotype relationships and predicting antibiotic resistances

Alice C. McHardy, Helmholtz Centre for Infection Research, Germany

5:00 p.m.

Coffee Break

5:30 p.m.

SESSION V: DATA SCIENCE IN INDIVIDUALIZED INFECTION MEDICINE

Individualization of medicine requires the handling of material and complex data and their analysis. Session V will give insights into recent developments and trends. Osmar Zaïane will share in his keynote his vision how artificial intelligence can be used in medicine and Fabian Theis will teach us about the potential of systems medicine. Thomas Illig will present the advances and the future of biobanking and Alena Buyx will consider ethical implications.

Chairs: *Gérard Krause, Helmholtz Centre for Infection Research, Germany and Michael Meyer-Hermann, Helmholtz Centre for Infection Research, Germany*

KEYNOTE

Artificial intelligence and medicine: machine learning as a catalyst for precision health

Osmar R. Zaïane, University of Alberta, Canada

Systems medicine: individualization between statistical and mechanistic approaches

Fabian Theis, Helmholtz Centre Munich, Germany

Next generation biobanking

Thomas Illig, Hannover Medical School, Germany

Good tailoring. Ethical implications of precision medicine

Alena Buyx, Christian-Albrechts-University of Kiel, Germany

7:30 p.m.

Conference Dinner

Saturday, June 23, 2018

8:00 a.m. Registration

9:00 a.m. **SESSION VI: INDIVIDUALIZED TREATMENT AND PREVENTION IN VIRAL INFECTIONS – HEPATITIS**

This Session is supported by the Thematic Translational Unit ‘Hepatitis’ of the German Center for Infection Research (DZIF).

The first part of Session VI will highlight few examples of today’s clinical practice of individualized medicine for infectious diseases. In his keynote Ralf Bartenschlager will show us how therapeutic developments based on individualized approaches finally led to a one-pill-fits-all strategy for hepatitis C virus infection. Markus Cornberg will give insights in the current management of hepatitis B virus infection and how cure might be achieved applying a patient-centered individualized approach. Finally, Heiner Wedemeyer will summarize current treatment options for hepatitis D and E virus infection and the potential of personalized management.

Chair: Thomas Pietschmann, TWINCORE, Centre for Experimental and Clinical Infection Research, Germany

KEYNOTE

Hepatitis C: how individualized medicine paved the way to a one pill fits all strategy

Ralf Bartenschlager, Heidelberg University, Germany

Individualized management of chronic hepatitis B virus infection - from diagnosis to cure

Markus Cornberg, Hannover Medical School, Germany

Personalized therapy of Hepatitis D and E

Heiner Wedemeyer, Essen University Hospital, Germany

10:15 a.m. **LIGHTNING TALKS**

Chairs: Luka Cicin-Sain, Helmholtz Centre for Infection Research, Germany and Frank Pessler, TWINCORE, Centre for Experimental and Clinical Infection Research, Germany

Selected travel grantees will present their work in short oral presentations.

10:45 a.m. Coffee Break

11:15 a.m. **CONTINUATION OF SESSION VI: INDIVIDUALIZED TREATMENT AND PREVENTION IN VIRAL INFECTIONS – HIV/AIDS**

In the second part of Session VI we will learn in the keynote of Michel Nussenzweig about the problems developing a HIV vaccine. Thomas Lengauer will show us how bioinformatics can be used to analyze viral drug resistance and the consequences for the treatment and Marylyn Addo will give us insights into today's individual management of HIV/AIDS in the clinics.

Chairs: Reinhold E. Schmidt, Hannover Medical School, Germany and Michel Nussenzweig, The Rockefeller University, USA

KEYNOTE

The HIV vaccine problem

Michel Nussenzweig, The Rockefeller University, USA

Bioinformatics-guided analysis of viral drug resistance

Thomas Lengauer, Max-Planck Institute for Informatics, Germany

Individualized management of HIV/AIDS patients

Marylyn M. Addo, University Medical Center Hamburg-Eppendorf, Germany

12:40 p.m. Lunch Break

1:30 p.m. **SESSION VII: PAVING THE WAY FOR INDIVIDUALIZED INFECTION MEDICINE**

In Session VII Christof von Kalle will tell us how individualized cancer medicine is today managed at the National Cancer Center (NCT) Heidelberg and will draw conclusions for the establishment of individualized infection medicine. Heyo Kroemer will draw our attention once more to the importance of information technology in individualized medicine. The final panel discussion will highlight the addressed questions during the conference and will aim to conclude on the needed next steps to pave the way for individualized infection medicine.

Chair: Ansgar W. Lohse, University Medical Centre Hamburg-Eppendorf, Germany

Individualized cancer medicine at NCT – lessons from oncology

Christof von Kalle, National Center for Tumor Diseases, Germany



Individualized medicine and information technology: two sides of one coin?

Heyo K. Kroemer, University Medical Center Göttingen, Germany

2:30 p.m.

PANEL DISCUSSION

Michael Manns, Centre for Individualized Infection Medicine, Germany

PARTICIPANTS

Edward Abrahams, Precision Medicine Coalition, USA

Heyo K. Kroemer, University Medical Center Göttingen, Germany

Ansgar W. Lohse, University Medical Centre Hamburg-Eppendorf, Germany

Christof von Kalle, NCT Heidelberg, Germany

Christopher Woods, Duke University, USA

3:15 p.m.

Closing

Michael Manns, Centre for Individualized Infection Medicine, Germany