



Join Keystone Symposia  
for the 2016 conference on:

# Nucleic Acid Sensing Pathways: Innate Immunity, Immunobiology and Therapeutics

May 8–12, 2016

Maritim Hotel & Conference Center | Dresden | Germany

Scientific Organizers:

Thomas Tuschl, Veit Hornung and Karl-Peter Hopfner

*This meeting focuses on cytoplasmic DNA and RNA sensors and the function of their linear and circular oligonucleotide second messenger cGAMP and 2',5'-oligoadenylate produced upon activation. Substantial progress has been made in identification of the structures of these sensors, their nucleic acid ligands and second messenger molecules, as well as the underlying molecular pathways leading to transcriptional activation. Animal models inactivating various pathways of innate immunity have been developed. This progress has enabled targeted development of antagonists and agonists of cytokine and interferon production for therapeutic targeting of inflammatory diseases and vaccine adjuvant development, respectively. An international group of academic and industry scientists and clinicians with expertise in biochemistry and structural biology, nucleic acid chemistry, immunology, human genetics, virology, rheumatology and vaccine development will converge at this meeting to discuss the latest developments in this field.*

Session Topics:

- Sensing of Microbial and Viral RNA and DNA by the Innate Immune System I & II
- Structural Biology of Innate Immune Sensing
- Virology and Innate Inflammatory Responses
- Inborn Genetic Defects in Nucleic Acid Sensing I & II
- Nucleic Acid Chemistry and Biology in Stress and Innate Immune Response
- Nucleic Acid Drug Developments and Strategies to Suppress Innate Immunity Responses



Submitting an abstract is a great way of participating in the conference through poster presentation and possible selection for a short talk.

Scholarship & Discounted Abstract Deadline: Jan 7, 2016

Abstract Deadline: Feb 9, 2016

Discounted Registration Deadline: Mar 8, 2016

For additional details, visit [www.keystonesymposia.org/16E2](http://www.keystonesymposia.org/16E2).

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### SUNDAY, MAY 8

#### Arrival and Registration

### MONDAY, MAY 9

#### Welcome and Keynote Address

\***Thomas Tuschl**, HHMI/Rockefeller University, USA

**Zhijian James Chen**, University of Texas Southwestern Medical Center, USA

*The cGAS Pathway of Cytosolic DNA Sensing and Its Role in Health and Diseases*

#### Sensing of Microbial and Viral RNA and DNA by the Innate Immune System

**Kensuke Miyake**, Institute of Medical Science, University of Tokyo, Japan

*RNA-Sensing and Trafficking of TLR7 in Plasmacytoid Dendritic Cells*

\***Kate A. Fitzgerald**, University of Massachusetts Medical School, USA

*Regulation of Inflammation by Long Non-Coding RNAs*

**Petro Starokadomskyy**, University of Texas Southwestern Medical Center, USA

*Short Talk: DNA Polymerase- $\alpha$  Regulates Type I Interferon Activation through Cytosolic RNA:DNA Synthesis*

**Kachiko Hayashi**, Yale University, USA

*Short Talk: Toll-Like Receptor 9 Trafficking and Signaling for Type I Interferons Requires PIKfyve Activity*

#### Poster Session 1

#### Sensing of Microbial and Viral RNA and DNA by the Innate Immune System II

\***Veit Hornung**, Ludwig-Maximilians-University Munich, Germany

*Molecular Mechanisms of Nucleic Acid Pattern Recognition*

**Timothy W. Behrens**, Genentech, Inc., USA

*Nucleic Acid Sensing and Interferon Signatures*

**Russell E. Vance**, University of California, Berkeley, USA

*No Perfect PAMPs? Innate Immune Recognition of Nucleic Acids versus Proteins*

**Tan Nguyen**, Walter and Eliza Hall Institute, Australia

*Short Talk: Sidt2 Transports Extracellular dsRNA into the Cytoplasm for Innate Immune Recognition*

### TUESDAY, MAY 10

#### Structural Biology of Innate Immune Sensing

\***Karl-Peter Hopfner**, Ludwig-Maximilians-University Munich, Germany

*Integrated ATP Dependent Mechanism for RIG-I's Distinction between Self and Non-Self RNA*

**Sun Hur**, Harvard Medical School, USA

*Molecular Mechanism of RIG-I-Like Receptors*

**Alexei Korennykh**, Princeton University, USA

*Innate Immune Signaling via RNA Cleavage*

**Hao Wu**, Harvard Medical School, Boston Children's Hospital, USA

*Structural Elucidation of Inflammasome Activation and Regulation*

**Pingwei Li**, Texas A&M University, USA

*Short Talk: The Structural Basis of IRF-3 Recruitment, Activation, and Targeting in Innate Immunity*

**Philip J. Kranzusch**, University of California, Berkeley, USA

*Short Talk: Ancient cGAS-STING Pathways Reveal Evolution of Human Innate Immunity*

#### Virology and Innate Inflammatory Responses

**Jaе U. Jung**, Keck School of Medicine of University of Southern California, USA

*Host Nucleic Acid Sensing and Viral Evasion*

**Ian Thomas Lamborn**, NIAID, National Institutes of Health, USA

*Short Talk: Human MDA5 Protects Against Severe Respiratory Infections*

\***Nicolas Manel**, Institut Curie, France

*Sensing Mechanisms of Viral Infection*

**Fanxiu Zhu**, Florida State University, USA

*Short Talk: KicGAS, KSHV Inhibitor of cGAS*

**Kareen Bartsch**, Christian-Albrechts-University, Germany

*Short Talk: RNaseH2 Deficiency Leads to Cytosolic Accumulation of Immunostimulatory DNA that is Removed by Autophagy*

#### Poster Session 2

### WEDNESDAY, MAY 11

#### Nucleic Acid Chemistry and Biology in Stress and Innate Immune Response

**Thomas Tuschl**, HHMI/Rockefeller University, USA

*Intra- and Extracellular Diagnostic RNAseq Approaches and Their Use in Inflammatory Diseases*

**Dinshaw J. Patel**, Memorial Sloan Kettering Cancer Center, USA

*Structure and Function of Innate Immune Sensors and Adaptors*

**Charles E. Samuel**, University of California, Santa Barbara, USA

*Roles of A-to-I RNA Editing by Adenosine Deaminase ADAR1 in Innate Immunity RNA Sensing*

\***Andreas Pichlmair**, Max-Planck Institute of Biochemistry, Germany

*Defects in mRNA Maturation and Localization*

**Swapnil Devarkar**, Rutgers University, USA

*Short Talk: Structural and Mechanistic Basis for Self Versus Non-self RNA Discrimination by the Innate Immune Receptor RIG-I*

#### Poster Session 3

#### Nucleic Acid Drug Developments and Strategies to Suppress Innate Immunity Responses

**Gunther Hartmann**, Universitätsklinikum Bonn, Germany

*Targeting RIG-I for the Immunotherapy of Cancer*

**Thomas W. Dubensky, Jr.**, Tempest Therapeutics, USA

*Direct Activation of STING in the Tumor Microenvironment Leads to Potent and Systemic Tumor Regression and Immunity*

\***Regina Heidenreich**, CureVac GmbH, Germany

*mRNA Vaccination for the Immunotherapy of Infectious Diseases and Cancer*

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**Manuel Ascano, Jr.**, Vanderbilt University, USA

*Short Talk: Towards the Small Molecule Modulation of Cyclic GMP-AMP Synthase Activity*

### THURSDAY, MAY 12

#### Inborn Genetic Defects in Nucleic Acid Sensing I

**Raphaela Theresia Goldbach-Mansky**, NIAID, LCID, National Institutes of Health, USA

*Activated STING in a Vascular and Pulmonary Syndrome (SAVI) and Treatment Strategies Reducing Interferon Signaling*

**Yanick Crow**, Institut Imagine, France  
*Human Type I Interferonopathies*

**Min Ae Lee-Kirsch**, Technische Universität Dresden, Germany  
*Human Genetic Alterations Contributing to Systemic Lupus Erythematosus*

\***Virginia Pascual**, Cornell University, USA

*Novel Insights into the Role of Innate Immunity in Human SLE*

**Rayk Behrendt**, Faculty of Medicine Carl Gustav Carus TU Dresden, Germany

*Short Talk: SAMHD1-Deficiency causes Simultaneous Stimulation of the RLR and cGAS-STING Pathways*

#### Inborn Genetic Defects in Nucleic Acid Sensing II

**Gerald S. Shadel**, The Salk Institute for Biological Studies, USA  
*Mitochondrial DNA Stress in Innate Immune Signalling and Cancer*

**Daniel B. Stetson**, University of Washington, USA  
*Nucleic Acid Detection in Autoimmunity*

\***Andrew Jackson**, University of Edinburgh, UK  
*RNase H2 mutations Lead to Defective Ribonucleotide Excision Repair and cGAS/STING-Dependent Innate Immune Activation*

#### Meeting Wrap-Up: Outcomes and Future Directions (Organizers)

### FRIDAY, MAY 13

#### Departure