



# Type I Interferon: Friend and Foe Alike

March 19–23, 2017 | Fairmont Banff Springs | Banff, Alberta | Canada

## Scientific Organizers:

**Alan Sher**, National Institute of Allergy and Infectious Diseases, National Institutes of Health, USA

**Virginia Pascual**, Baylor Research Institute, USA

**Adolfo García-Sastre**, Mount Sinai School of Medicine, USA

**Anne O'Garra**, Francis Crick Institute, UK

## Joint with the meeting on *Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease*

While cytokines play critical roles in host defense and immune homeostasis, in other settings, they can be key mediators of inflammatory pathology. This important functional dichotomy is perhaps best exemplified in the diverse activities of Type I interferon(s) in health and disease. Type I IFNs regulate a broad family of genes that either stimulate or inhibit immune function and in so doing have host protective or detrimental effects. Thus, while Type I IFNs are well-known for their anti-viral activity and stimulation of effector T cell responses, they can also promote autoimmune, bacterial and even certain viral diseases. Understanding this contextual dependency is crucial for unraveling the pathogenesis of Type I IFN-dependent diseases and for the design of interferon-based therapies and will be the central focus of the meeting. The conference will open with talks presenting an overview of Type I IFN genes and their regulation, innate recognition mechanisms and signaling pathways for Type I IFN induction and Mendelian-based interferonopathies. Additional sessions will focus on the role of Type I IFN in viral, bacterial and autoimmune diseases. The symposium will conclude with a discussion of the mechanistic and contextual factors that determine the beneficial versus deleterious outcome of Type I IFN induction and how this information can be applied to the development of targeted therapeutic interventions. Because of the timeliness of the topic, the conference should draw a broad audience from the fields of cytokine biology, inflammation, infectious disease and translational medicine and attract a solid industry representation.


## Session Topics:

- Nucleic Acid Recognition Pathways Regulating Type I IFN Induction (Joint)
- Workshop 1: Innate Signals for Type I IFN Induction
- Mendelian Interferonopathies and IFN Deficiencies
- Type I IFN Regulation of Viral Infection and Cancer
- Workshop 2: Role of Type I IFNs in Control and Enhancement of Infection/Malignancy
- Type I IFN Regulation of Viral Infection
- Type I IFN Regulation of Bacterial Infection and Disease
- Role of Type I IFN in Complex Autoimmunity
- Mechanisms Underlying Divergent Functions of Type I IFNs
- Workshop 3: Type I IFN in Clinical and Experimental Autoimmunity
- Tailoring Type I IFN Interventions to Achieve Cure

**Scholarship Application & Discounted Abstract Deadline: November 17, 2016**

**Abstract Deadline: December 20, 2016**

**Discounted Registration Deadline: January 19, 2017**



Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted.

Upper image of cytokines courtesy of National Institute of Allergy and Infectious Diseases, NIH

Meeting Hashtag: #KSifn

[www.keystonesymposia.org/17X6](http://www.keystonesymposia.org/17X6)

KEYSTONE SYMPOSIA™  
on Molecular and Cellular Biology

Accelerating Life Science Discovery

[www.keystonesymposia.org/meetings](http://www.keystonesymposia.org/meetings) | 1.800.253.0685 | 1.970.262.1230

a 501(c)(3) nonprofit educational organization

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

### SUNDAY, MARCH 19

#### Arrival and Registration

### MONDAY, MARCH 20

#### Welcome and Keynote Session (Joint)

\***Thirumala-Devi Kanneganti**, St. Jude Children's Research Hospital, USA

\***Alan Sher**, NIAID, National Institutes of Health, USA

**Anne O'Garra**, Francis Crick Institute, UK

*Type I IFN Regulation of Cytokine Networks and Consequences for Infection*

**Daniel Kastner**, National Institutes of Health, USA

*PRR Signaling and Inflammatory Disease*

#### Nucleic Acid Recognition Pathways Regulating Type I IFN Induction (Joint)

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

*Cytosolic Recognition of DNA through cGAS/STING Pathway*

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

*Cytosolic Sensing of Viral RNA by the RIG-I-Like Receptors*

**Gregory M. Barton**, University of California, Berkeley, USA

*Endosomal Recognition of Self-Nucleic Acids*

**Vishva M. Dixit**, Genentech, Inc., USA

*Inflammasome Signaling*

#### Workshop 1: Innate Signals for Type I IFN Induction (X6)

\***Paul J. Hertzog**, Hudson Institute of Medical Research, Australia

\***Dusan Bogunovic**, Icahn School of Medicine at Mount Sinai, USA

**John Ty Crowl**, University of Washington, USA

*Loss of Sumoylation Triggers a Spontaneous Type I Interferon Response Independent of Cytosolic Nucleic Acid Sensing Pathways*

**Martin R. Jakobsen**, department of biomedicine, Denmark

*IFI16 Dictates DNA Sensing in Human Macrophages by Promoting Production and Function of cGAMP*

**Stefanie Luecke**, Aarhus University, Denmark

*Length-Dependent Sensing of Low-Abundance dsDNA by cGAS*

**Jennifer Lumb**, Stanford University, USA

*Unbiased Haploid Genetic Screen Uncovers a Novel RNA Binding Immune Regulator*

**Nathalie M. Grandvaux**, Université de Montréal, Canada

*Characterization of a Delayed Transcriptional Program Induced in Response to the Synergistic Action of IFN $\beta$ +TNF $\alpha$  Reveals Novel STAT2 and IRF9-Dependent Pathways*

**Jennie B. Altman**, Icahn School of Medicine at Mount Sinai, USA

*Non-Canonical Type I IFN Signaling in ISG15 $^{-/-}$  and USP18 $^{-/-}$  Cells*

**Antje Blumenthal**, University of Queensland, Australia

*Spatiotemporal Regulation of TLR4 Signaling and Promotion of Type I IFN Responses by the RP105-PI3K p110delta Innate Immune Signaling Axis*

**Philippe D. Pierre**, Centre d'Immunologie Marseille-Luminy, CIML, France

*Ppp1r15a/GADD34 Controls Heterogeneity of Type-I Interferon Production in Response to dsRNA*

#### Workshop 1: PRRs in Inflammatory Diseases (X5)

\***Fayyaz Sutterwala**, Cedars-Sinai Medical Center, USA

\***Eicke Latz**, University of Bonn, Germany

**Sreya Ghosh**, University of Massachusetts Medical School, USA

*The PYHIN Protein IFI205 Regulates Immune Signaling by Controlling Expression of the Inflammasome Adaptor ASC*

**Mena Abdel-Nour**, University of Toronto, Canada

*The eIF2 alpha Kinase HRI Senses Protein Aggregation and Facilitates Signaling of Innate Immune Receptors*

**José Santos**, University of Basel, Switzerland

*Novel GBP-Dependent Mechanisms of Inflammasome Activation*

**Matthew James George Eldridge**, Imperial College London, UK

*The Atypical Ubiquitin E2 Conjugase UBE2L3 is an Indirect Caspase-1 Target and controls IL-1 $\beta$  Secretion by Inflammasomes*

**Nidhi Jain**, Cedars-Sinai Medical Center, USA

*NLRP12 Mutation Causes C57BL/6J Strain-Specific Defect in Neutrophil Recruitment*

**Nina Van Opdenbosch**, VIB-University of Ghent, Belgium

*Defective Caspase-1 Recruitment Licenses ASC Specks to Engage Non-Inflammatory Caspase-8-Driven Apoptosis in Macrophages and Intestinal Epithelial Cells*

**Charlotte Macleod**, University of Cambridge, UK

*Determining the Stoichiometry of the TLR-4 Adaptor Protein Mal/TIRAP using TIRF Microscopy*

**Scott W. Canna**, Children's Hospital of Pittsburgh, University of Pittsburgh, USA

*Chronic IL-18 of Diverse Origins Defines and Drives the Hyperinflammatory State Known as Macrophage Activation Syndrome*

#### Mendelian Interferonopathies and IFN-Deficiencies (X6)

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

**Dusan Bogunovic**, Icahn School of Medicine at Mount Sinai, USA

*Loss of Type I Interferon Negative Regulation in Humans*

**Min Ae Lee-Kirsch**, Technische Universität Dresden, Germany

*Defective Intracellular Nucleic Acid Waste Management in Type 1 Interferon-Driven Autoinflammation and Autoimmunity*

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

**Raphaela Theresia Goldbach-Mansky**, NIAID, LCID, National Institutes of Health, USA  
*Novel Insights into the Pathogenesis and Treatment Approaches of the Type I-IFN-Mediated Autoinflammatory Diseases, CANDLER and SAVI*

**Joaquín M. Espinosa**, University of Colorado Boulder, USA  
*Short Talk: Trisomy 21 Consistently Activates the Interferon Response: Understanding Down Syndrome as an Interferonopathy*

### Nucleic Acids in TLR and NLR Signaling (X5)

\***Mohamed Lamkanfi**, Ghent University, Belgium

**Jonathan C. Kagan**, Boston Children's Hospital, USA  
*Initiation and Regulation of Innate Immune Signal Transduction*

**Kate A. Fitzgerald**, University of Massachusetts Medical School, USA  
*Novel Regulators of PRR-Driven Transcriptional Responses*

**Thirumala-Devi Kanneganti**, St. Jude Children's Research Hospital, USA  
*Inflammasomes and Pathogen Sensing*

**Osamu Takeuchi**, Institute for Virus Research, Kyoto University, Japan  
*Short Talk: Spatiotemporal Regulation of Inflammatory mRNAs in Innate Immune Responses*

### Poster Session 1

### TUESDAY, MARCH 21

#### Type I IFN Regulation of Viral Infection and Cancer (X6)

\***Adolfo García-Sastre**, Mount Sinai School of Medicine, USA

**Ana Fernandez-Sesma**, Mount Sinai School of Medicine, USA  
*Modulation of Innate Immunity by Dengue Virus: Feeling the STING*

**Andreas Wack**, Francis Crick Institute, UK  
*Unique and Overlapping Roles of Type I and Type III Interferons in Influenza Infection*

**John W. Schoggins**, University of Texas Southwestern Medical Center, USA  
*Cell Intrinsic Modulation of Viral and Bacterial Infection by IFN-Stimulated Genes*

**Thomas J. Braciale**, University of Virginia, USA  
*Innate Immune Control of Respiratory Virus Infection*

**Gaya Amarasinghe**, Washington University School of Medicine, USA  
*Short Talk: Control of Type I IFN Signaling in Negative Sense RNA Viruses*

**Jason Waithman**, Telethon Kids Institute, Australia  
*Short Talk: IFN $\alpha$  Subtypes Drive Distinct Anti-Cancer Activities*

#### Recent Insights in Inflammasome Signaling (X5)

\***Vishva M. Dixit**, Genentech, Inc., USA

**Fayyaz Sutterwala**, Cedars-Sinai Medical Center, USA  
*Cardiolipin Promotes Mitochondrial Localization of NLRP3 and Caspase-1*

**Mohamed Lamkanfi**, Ghent University, Belgium  
*Inflammasome Regulation in Auto-Inflammation*

**Kim Newton**, Genentech, Inc., USA  
*Regulation of Inflammation and Cell Death by RIPK1*

**Feng Shao**, National Institute of Biological Sciences, China  
*Pyroptosis in Anti-Bacterial Immunity: Sensing & Execution*

**Bharat Behl**, University of Connecticut Health Center, USA  
*Short Talk: Molecular Determinants of Noncanonical Inflammasome Activation by LPS*

**Olaf Groß**, Universitätsklinikum Freiburg, Germany  
*Short Talk: Caspase-1 Mutant Mouse Reveals a Central Role of Caspase-1 Protease Activity and GSDMD in Fate Decisions After Inflammasome Activation*

#### Meet the Editors

\***Teodoro Pulvirenti**, Journal of Experimental Medicine, USA

#### Workshop 2: Role of Type I IFNs in Control and Enhancement of Infection (X6)

\***Thomas J. Braciale**, University of Virginia, USA

\***Katrin D. Mayer-Barber**, NIAID, National Institutes of Health, USA

**Charles S. Dela Cruz**, Yale University, USA  
*Chitinase-Like Protein Chi311 Modulates Type I Interferon Response through TLR9-AP3-IRF7 Axis during Streptococcus Pneumoniae Lung Infection*

**Ren Sun**, University of California, Los Angeles, USA  
*Genome-Wide Identification of Anti-Interferon Functions in Influenza A Virus*

**Lindsey Cook**, Washington University in St. Louis, USA  
*Differential Roles of Type I Interferons in Chikungunya Virus Infection*

**Bastian Opitz**, Charité University Medicine Berlin, Germany  
*A Common Loss-of-Function Variant of STING Affects cGAS-Dependent Antibacterial Defense*

**Laura Sinigaglia**, Institut Pasteur, France  
*Transfer of Yellow Fever Virus RNA from Infected Cells to Plasmacytoid Dendritic Cells Triggers Interferon Production*

**Nick Parekh**, Penn State College of Medicine, USA  
*cGAS Mediates a Protective Local Response to Dermal Vaccinia Infection Independent of Control of Virus Replication*

**Susan Pereira Ribeiro**, Case Western Reserve University, USA  
*Different Interferon Signatures Characterize Two Subclasses of Immune Non-responder Subjects*



# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

### Workshop 2: PRRs in Inflammatory Diseases (X5)

\***Dmitry M. Shayakhmetov**, Emory University, USA

\***Denise M. Monack**, Stanford University, USA

**T. Sam Xiao**, Case Western Reserve University, USA  
*Structures of GSDMD C-Terminal Domain Suggest Mechanisms of Autoinhibition*

**Igor E. Brodsky**, University of Pennsylvania, USA  
*Role of Caspase-8 Enzymatic Activity in Control of TLR-Induced Macrophage Gene Expression*

**Damien Arnoult**, Hopital Paul Brousse, France  
*The Golgi Apparatus Acts as a Platform for TBK1 Activation After Viral RNA Sensing*

**Randilea Nichols**, University of California, Los Angeles, USA  
*NLR4 Inflammasome Activation in Neutrophils is Sufficient to Cause Systemic Inflammatory Disease*

**Rosalie Heilig**, University of Basel, Switzerland  
*The Role of Gasdermin D in IL-1 $\beta$  Release*

**Cindy Chiang**, University of Chicago, USA  
*The Human Papillomavirus E6 Oncoprotein Inhibits TRIM25- and RIG-I-Mediated Innate Immune Signaling*

**Andrea Ablasser**, Ecole Polytechnique Fédérale de Lausanne, Switzerland  
*Innate Immune Sensing of Cytosolic Chromatin Fragments through cGAS Promotes Cellular Senescence*

### Type I IFN Regulation of Viral Infection (X6)

\***Andreas Wack**, Francis Crick Institute, UK

**Netanya Sandler Utay**, University of Texas Medical Branch at Galveston, USA  
*Type I Interferons: Barrier or Pathway to HIV Disease?*

**Adolfo García-Sastre**, Mount Sinai School of Medicine, USA  
*Regulation of Influenza Virus Sensing and Antiviral Responses by Host and Virus Factors*

**Andreas Pichlmair**, Max-Planck Institute of Biochemistry, Germany  
*Interactions of Cellular Proteins with Viral Nucleic Acids*

**Ricardo Rajsbaum**, University of Texas Medical Branch, USA  
*Short Talk: Friend and Foe in the Regulation of IFN Pathways: Pro-Viral and Anti-Viral Functions of the Host E3-Ubiquitin Ligase TRIM6*

### Interfering with Pathogenic TLR and NLR Signaling (X5)

\***Gabriel Nuñez**, University of Michigan, USA

**Dana Philpott**, University of Toronto, Canada  
*Nod2 Signaling*

**Dmitry M. Shayakhmetov**, Emory University, USA  
*Non-canonical Regulated Necrotic Death and Sensing Danger*

**Jenny P.Y. Ting**, University of North Carolina at Chapel Hill, USA  
*Intracellular Innate Immune Receptors: Regulators of Inflammation, Cancer and Immunity*

**Vikram R. Rao**, Pfizer, USA  
*Short Talk: IRAK4 Kinase Inhibitors: Emerging Biology and Therapeutic Implications*

### Poster Session 2

#### WEDNESDAY, MARCH 22

### Type I IFN Regulation of Bacterial Infection and Disease (X6)

\***Alan Sher**, NIAID, National Institutes of Health, USA

**Thomas J. Scriba**, University of Cape Town, South Africa  
*IFN Signatures that Predict Human Tuberculosis*

**Katrin D. Mayer-Barber**, NIAID, National Institutes of Health, USA  
*The Dichotomy between Interleukin 1 and Type I Interferon during Mycobacterium Tuberculosis Infection Exposes Distinct and Opposing Classes of Inflammation*

**Craig R. Roy**, Yale University School of Medicine, USA  
*Modulation of Type I Interferon Production during Infection by Vacuolar Pathogens*

**Jacques F. Banchereau**, The Jackson Laboratory for Genomic Medicine, USA  
*Human Dendritic Cell Subsets Differentially Respond to Vaccines*

**Terje Espevik**, Norwegian University of Science and Technology, Norway  
*Short Talk: CD150 Positively Regulates TRAM Recruitment to E.coli Phagosomes and Type I IFN Secretion*

**Beiyun Caitlin Liu**, Tufts University, USA  
*Short Talk: Host-Intrinsic Interferon Signaling Licenses GBP-Mediated Attack on Cytosolic Bacteria*

### PRR Signaling in Bacterial and Viral Infection (X5)

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

**Russell E. Vance**, University of California, Berkeley, USA  
*Activation of Inflammasomes by Bacterial Pathogens*

**Amal Amer**, Ohio State University, USA  
*Unconventional Functions of Inflammasomes*

**Denise M. Monack**, Stanford University, USA  
*Inflammasomes and Bacterial Infections*

**Christian Holm**, Aarhus University, Denmark  
*Short Talk: Nitro-Fatty Acids Can Suppress STING Signaling*

**Peng Li**, National Institute of Biological Sciences, China  
*Short Talk: Ubiquitination and Degradation of GBPs by Shigella Ipa9.8 Effector to Suppress Host Defenses*

**Valesca Lindenbergh**, Institute of Medical Microbiology and Hospital Hygiene, Germany  
*Short Talk: Extensive Characterization of mGBPs Localization Chlamydia trachomatis Infection*

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

**Katelyn Susanne Burleigh**, University of Washington, USA  
*Short Talk: Uncovering the Mechanism of E1A Antagonism of the cGAS-STING Pathway*

### Role of Type I IFN in Complex Autoimmunity (X6)

\***Virginia Pascual**, Cornell University, USA  
*Pathogenic Functions of Type I IFN in SLE*

\***Richard M. Siegel**, NIAMS, National Institutes of Health, USA  
*Interferon, Anti-Interferon Antibodies and NK Cells in Systemic Autoimmunity*

**Robert C. Axtell**, Oklahoma Medical Research Foundation, USA  
*Immunological Heterogeneity in Neurological Autoimmunity: Lessons from Studying Type I Interferon Responses*

**Mari L. Shinohara**, Duke University, USA  
*Short Talk: Type-I Interferons and the NLRP3 Inflammasome in CNS Autoimmunity*

### Inflammasome and NF- $\kappa$ B Regulatory Mechanisms (X5)

\***Thirumala-Devi Kanneganti**, St. Jude Children's Research Hospital, USA

**Christian Stehlik**, Northwestern University, USA  
*Inflammasome Inhibition*

**Eicke Latz**, University of Bonn, Germany  
*Inflammasomes in Health and Disease*

**Luke A. J. O'Neill**, Trinity Biomedical Sciences Institute, Ireland  
*Metabolic Reprogramming in Innate Immunity and Inflammation*

**Ali A. Zarrin**, Genentech, Inc., USA  
*Short Talk: TPL2 Kinase Activates MEK-1/2 and/or MEK-3/6 to Regulate Inflammatory Pathways in Myeloid Cells*

### Poster Session 3

#### THURSDAY, MARCH 23

### Mechanisms Underlying Divergent Functions of Type I IFNs (X6)

\***Anne O'Garra**, Francis Crick Institute, UK

**Jae U. Jung**, Keck School of Medicine of University of Southern California, USA  
*TRIM-Mediated Control of Type I IFN Pathway*

**Marco Colonna**, Washington University School of Medicine, USA  
*Targeting Type I IFN Activity through Plasmacytoid DC*

**Laurel L. Lenz**, University of Colorado, USA  
*Role of Type I - Type II IFN Crosstalk in Macrophage Effector Function*

**Gideon Schreiber**, Weizmann Institute, Israel  
*The Molecular Basis for Differential Activity of Type I Interferons*

**Paul J. Hertzog**, Hudson Institute of Medical Research, Australia  
*Short Talk: Systems Biology of Type I Interferon Responses*

**Ronald L. Rabin**, US Food and Drug Administration, USA  
*Short Talk: A Potential Modulatory Role for IFN $\alpha$ 1 Dependent on its Low Affinity for IFNAR2*

### Interactions between Microbiota and the Innate Immune System (X5)

\***Mihai G. Netea**, Radboud University, Netherlands

**Daniel Graham**, Massachusetts General Hospital, USA  
*Host Genetics and Microbe Interactions in Human Disease*

**Kathy D. McCoy**, University of Calgary, Canada  
*Intestinal Commensal Microbiota and Education of the Innate Immune System*

**Gabriel Nuñez**, University of Michigan, USA  
*Control of Pathogen Colonization by Host Immunity and the Microbiota in the Gut*

**Andrew T. Gewirtz**, Georgia State University, USA  
*Microbial-Mediated Protection from Infectious Disease*

**Prosper N.**

**Stephen Rubino**, Brigham and Women's Hospital, USA  
*Activated Microglia Induce Type 1-interferon Dependent Neurodegeneration*

### Workshop 3: PRRs in Inflammatory Diseases (X5)

\***Amal Amer**, Ohio State University, USA  
\***Dana Philpott**, University of Toronto, Canada

**Eric P. Hanson**, National Institutes of Health, USA  
*A Novel NEMO Isoform Mediates Enhanced Antiviral Activity and Autoinflammatory Disease via Stabilization of IKKepsilon*

**Kiva V. Brennan**, Trinity College Dublin, Ireland  
*Designing Vaccines for the Paediatric Population; Potential for Cytosolic Nucleic Acids as Vaccine Adjuvants*

**Nesrin Ozoren**, Bogazici University, Turkey  
*ASC Specks as Vaccine Technology*

**Jingjin Ding**, National Institute of Biological Sciences, China  
*LPS Binding to Caspase-1/4/5 Triggers Pyroptosis by Releasing the Pore-Forming Activity of GSDMD*

**Orna**

**Vishva Deep Dixit**, Yale University, USA  
*Metabolic Control of Inflammasomes*

**Mihai G. Netea**, Radboud University, Netherlands  
*Metabolic Basis for Trained Innate Immunity*

### Meeting Wrap-Up: Outcomes and Future Directions (X6)

\***Alan Sher**, NIAID, National Institutes of Health, USA

### Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (X5)

**FRIDAY, MARCH 24**

**Departure**

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

**Boyaka**, Ohio State University, USA  
*Regulation of Mucosal Immunity by Toxins and Microbiota*

**Grace Yi Chen**, University of Michigan, USA  
*Short Talk: NLRP6 Limits Colonization of Akkermansia to Protect Against the Development of Colitis and Colon Tumorigenesis*

**Felix Yarovinsky**, University of Rochester Medical Center, USA  
*Short Talk: Loss of Paneth Cell Autophagy Leads to Catastrophic Susceptibility to Acute Gastrointestinal Inflammation*

### Workshop 3: Role of Type I IFNs in Autoimmunity and Malignancy (X6)

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

\***Marco Colonna**, Washington University School of Medicine, USA

**Kebin Liu**, Medical College of Georgia, USA  
*Jak-STAT-Mediated Chronic Inflammation Impairs Cytotoxic T Lymphocyte Activation to Decrease Anti-PD-1 Immunotherapy*

**Rabinovich-Ernst**, NIAID, National Institutes of Health, USA  
*An Arrayed Genome-Wide RNAi Screen for the Discovery of Novel Inflammasome Regulators*

**Thomas A. Kufer**, University of Hohenheim, Germany  
*Roles of NLRP10 in Innate and Adaptive Immunity*

### Navigating the Peer Review Process (X5)

\***Tina M. McIntyre**, National Institutes of Health, USA

### Tailoring Type I IFN Interventions to Achieve Cure (X6)

\***Jacques F. Banchereau**, The Jackson Laboratory for Genomic Medicine, USA  
**Geraldine P. Grouard-Vogel**, Neovacs, France  
*Overexpression of IFN $\alpha$  and Derived Diseases: Innovative Approach with a Therapeutic Vaccine IFN $\alpha$  Kinoid*

**Gary P. Sims**, MedImmune Inc, USA  
*Novel Pathogenic Role for IgE in SLE, and Pharmacological Blockade of Type I IFN Receptor in Patients*

**John J. O'Shea**, NIAMS, National Institutes of Health, USA  
*Targeting Type I IFN Signaling Pathways*

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

Supported by the Directors' Fund

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.

Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017

### *immunotherapy*

*Efficacy in  
Pancreatic Cancer*

#### **Jacquelyn**

**Gorman**, Seattle  
Children's  
Research Institute,  
USA

*The IFIH1A946T  
Coding Variant*

*Mediates an  
Interferon Program  
that Limits Viral  
Infection but  
Increases the Risk  
for Autoimmunity*

#### **Mark E. Kleinman**,

University of  
Kentucky, USA

*Epigenetic  
Regulation of Type  
I IFN Response in  
Age-Related  
Macular  
Degeneration*

#### **Elisaveta**

**Voynova**,  
Medimmune, USA  
*Blockade of Critical  
Immune Regulators  
Results in Different  
Roads to*

*Pathogenesis in  
Primary Sjögren's  
Syndrome*

#### **Mona Motwani**,

University of  
Massachusetts,  
USA

*The cGAS-STING  
Pathway Restrains  
Systemic  
Autoimmunity*

#### **Simone Caielli**,

Baylor Institute for  
Immunology  
Research, USA  
*Oxidized*

*Mitochondrial DNA  
is a Powerful  
Activator of Human  
pDCs and Induces  
a Lupus-Specific  
CD4 T Cell  
Phenotype*

### **Innate Immune Receptors and Metabolism (X5)**

**\*Prosper N. Boyaka**,  
Ohio State University,  
USA

**Marcia A. Munoz**,  
Garvan Institute of  
Medical Research,  
Australia

*Short Talk: Defective  
Protein Prenylation Is  
a Diagnostic  
Biomarker for  
Mevalonate Kinase  
Deficiency*

**Je-Wook Yu**, Yonsei  
University College of  
Medicine, South Korea  
*Short Talk:*

*25-Hydroxycholesterol  
Contributes to  
Cerebral Inflammation  
of X-Linked  
Adrenoleukodystrophy  
(X-ALD) through  
Activation of the  
NLRP3 Inflammasome*

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Type I Interferon: Friend and Foe Alike (X6)

Scientific Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra

*Supported by the Directors' Fund*

## Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)

Scientific Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi

March 19-23, 2017 • Fairmont Banff Springs • Banff, Alberta, Canada

*Sponsored by AbbVie Inc., Genentech, Inc. and Merck & Co., Inc.*

*Abstract & Scholarship Deadline: November 17, 2016 / Abstract Deadline: December 20, 2016 / Discounted Registration Deadline: January 19, 2017*