



# Cell Death and Inflammation

May 29–June 2, 2017 | Royal Dublin Society | Dublin | Ireland

## Scientific Organizers:

**Seamus J. Martin**, Trinity College Dublin, Ireland

**John Silke**, Walter and Eliza Hall Institute of Medical Research, Australia

## Joint with the meeting on *Integrating Metabolism and Immunity*

Cell death has long been known to be an important instigator of inflammation in sterile injury, as well as an amplifying factor in infection-associated inflammation, but the specific molecules underpinning this remain obscure. Understanding how dead and dying cells initiate and escalate inflammation has important implications for our understanding and treatment of autoinflammatory and infectious diseases. This meeting will explore current knowledge concerning the cellular constituents that drive inflammation (i.e., damage-associated molecular patterns), as well as how abnormal modes of cell death, such as necrosis, necroptosis and NETosis, can perturb inflammatory outputs and responses to dying cells. In particular, the conference aims to explore gaps in our current understanding of how dead and dying cells influence inflammatory responses in disease settings and will bring together experts in two major research fields, "cell death" and "inflammation," for the purpose of clarifying what the key questions and therapeutic targets are in this rapidly evolving area. Many well-known physiological drivers of cell death (e.g., TNF, TRAIL, CD95/Fas), as well as the molecules that transduce signals from these receptors (e.g., RIPKs, IAPs, TRAFs, IKKs), are also centrally involved in promoting inflammation. However, the tremendous overlap between cell death and inflammatory signaling is only becoming appreciated of late, and although it is also widely accepted that the constituents of healthy cells can drive inflammation upon release into the extracellular space, the identity of these cellular constituents is still a matter of debate. This meeting will focus on teasing out the relationships between cell death and inflammatory signaling to highlight how perturbation of either of these processes invariably impacts upon the other. This meeting will also explore the nature of the molecules that promote and modulate inflammation during cell death. The meeting will bring together scientists from diverse fields (cell death, inflammation, cancer, innate immunity) that would not normally interact, and will identify and explore the key questions and directions that will shape the future of research in this field.

## Session Topics:

- Inflammatory Responses to Cell Death I
- Inflammatory Responses to Cell Death II
- Inflammatory Signaling I
- Inflammatory Signaling II
- Tissue Responses to Dying Cells
- Stress Signals and Inflammation
- Alternative Cell Death Modalities and Inflammation
- Inflammation and Cancer

**Scholarship Application & Discounted Abstract Deadline: January 31, 2017**

**Abstract Deadline: March 1, 2017**

**Discounted Registration Deadline: March 29, 2017**



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

Upper image courtesy of National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Institutes of Health

Meeting Hashtag: #KScelldeath

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## Integrating Metabolism and Immunity (E4)

Scientific Organizers: **Hongbo Chi, Erika L. Pearce, Richard A. Flavell and Luke A.J. O'Neill**

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### MONDAY, MAY 29

#### Arrival and Registration

### TUESDAY, MAY 30

#### Welcome and Keynote Session (Joint)

\***Hongbo Chi**, St. Jude Children's Research Hospital, USA

\***Seamus J. Martin**, Trinity College Dublin, Ireland

**Diane Mathis**, Harvard Medical School, USA

*T Cell Control of Organismal Metabolism*

**Ruslan Medzhitov**, HHMI/Yale University School of Medicine, USA

*Tissue Homeostasis and Inflammation*

#### Inflammatory Responses to Cell Death I (K2)

\***Seamus J. Martin**, Trinity College Dublin, Ireland

**Kenneth L. Rock**, University of Massachusetts Medical School, USA  
*DAMPs and Inflammation*

**David Wallach**, Weizmann Institute of Science, Israel  
*Non-Deadly Pro-Inflammatory Functions of Mechanisms that Signal for Programmed Necrosis*

**John Silke**, Walter and Eliza Hall Institute of Medical Research, Australia

*Beware the MLKL, the Jaws that Bite: Uffish Thoughts on the Role of Necroptosis and Inflammation*

**Stephen Tait**, Cancer Research UK Beatson Institute, UK  
*Short Talk: Mitochondrial Permeabilization Engages NFκB and Anti-Tumor Immunity under Caspase-Deficient Conditions*

**Kate E. Lawlor**, Walter and Eliza Hall Institute of Medical Research, Australia

*Short Talk: Cell Death-Induced Inflammasome Activation: Mechanisms and Disease Relevance*

#### Glucose Metabolism to Fuel Immune Cell Functions (E4)

\***Jeffrey C. Rathmell**, Vanderbilt University, USA  
*Glut1 and Metabolic Reprogramming of CD4 T Cell Subsets*

**Luke A. J. O'Neill**, Trinity Biomedical Sciences Institute, Ireland  
*The Warburg Effect in LPS-Activated Macrophages*

**Edward J. Pearce**, Max Planck Institute of Immunobiology and Epigenetics, Germany  
*Glucose Metabolism in Alternative Macrophage Activation*

**Thomas Weichhart**, Medical University of Vienna, Austria  
*Short Talk: Metabolic Aspects of Granuloma Formation by Macrophages Regulated by mTORC1*

**Maxim Artyomov**, Washington University in St. Louis, USA  
*Short Talk: Itaconate Links Inhibition of Succinate Dehydrogenase with Macrophage Metabolic Remodeling and Regulation of Inflammation*

#### Workshop 1: Molecular Controls of Cell Metabolism in the Immune System (E4)

\***David K. Finlay**, Trinity Biomedical Sciences Institute, Ireland

\***Madhusudhanan Sukumar**, NCI, National Institutes of Health, USA

**Carlos Carmona-Fontaine**, New York University, USA  
*Metabolic Origins of Spatial Organization in the Tumor Microenvironment*

**Linda V. Sinclair**, University of Dundee, Scotland  
*Temporally Regulated Amino Acid Uptake through SLC7A5 Is Required for T Follicular Helper Cell Differentiation*

**Roger Geiger**, Institute for Research in Biomedicine, Switzerland  
*L-Arginine Modulates T Cell Metabolism and Enhances Survival and Anti-Tumor Activity*

**Dirk Brenner**, Luxembourg Institute of Health, Luxembourg  
*Glutathione Primes T Cell Metabolism for Inflammation*

**G-One Ahn**, Pohang University of Science and Technology, South Korea

*Reduced Glycolytic Metabolism in Adipose-Tissue Macrophages Facilitates Lipolysis in Mice*

**Lena Pernas**, University of Padua, Italy  
*Mitochondria Limit Toxoplasma Growth by Competing for Fatty Acids*

#### Inflammatory Responses to Cell Death II (K2)

\***John Silke**, Walter and Eliza Hall Institute of Medical Research, Australia

**Peter Vandenabeele**, VIB, Ghent University, Belgium  
*Role of Ferroptosis in Cancer Treatment and Immunogenic Cell Death (ICD)*

**Seamus J. Martin**, Trinity College Dublin, Ireland  
*Neutrophil-Derived Proteases Escalate Inflammation through Activation of IL-1 Family Cytokines Released via Necrosis*

**Siddharth Balachandran**, Fox Chase Cancer Center, USA  
*Short Talk: Influenza Virus-Activated DAI-RIPK3-Driven Cell Death*

**Andrew Oberst**, University of Washington, USA  
*Short Talk: Death-Independent Roles of RIPK1 and RIPK3 in the Restriction of Neuroinvasive Flavivirus Infection*

**Murray CH Clarke**, Cambridge University, UK  
*Short Talk: The Coagulation and Immune Systems Are Fundamentally Linked by the Activation of interleukin-1α by Thrombin*

**Ranja Salvamoser**, Walter and Eliza Hall Institute of Medical Research, Australia

*Short Talk: Impact of Deleting All Murine CARD Containing Caspases on Cell Death and Other Cell Signaling Pathways*

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### Transcriptional and Epigenetic Control in Immune Metabolism (E4)

\***Susan M. Kaech**, Yale University School of Medicine, USA

**Douglas R. Green**, St. Jude Children's Research Hospital, USA  
*c-Myc and Metabolic Regulation of T Cell Activation and Differentiation*

**John J. O'Shea**, NIAMS, National Institutes of Health, USA  
*Regulatory Nodes in T Cells*

**Hai-Hui (Howard) Xue**, University of Iowa, USA  
*Short Talk: Runx3 Guards Cytotoxic CD8+ Effectors Against Tfh Deviation in Acute Viral Infection*

**Mihai G. Netea**, Radboud University, Netherlands  
*Metabolic and Epigenetic Reprogramming in Myeloid Cells*

**Kenneth Smith**, University of Cambridge, UK  
*Short Talk: Distinct Pathways Governing Susceptibility and Patient Outcome in Autoimmune and Inflammatory Disease*

### Poster Session 1

#### WEDNESDAY, MAY 31

#### Inflammatory Signaling I (K2)

\***Kim Newton**, Genentech, Inc., USA

**Mads Gyrd-Hansen**, University of Oxford, UK  
*EMBO Young Investigator Lecture: Regulation of Ubiquitination in Inflammatory Signaling*

**Henning Walczak**, University College London, Cancer Institute, UK  
*Cell Death and Ubiquitin in Cancer, Inflammation and Immunity*

**Rune Busk Damgaard**, Medical Research Council Laboratory of Molecular Biology, UK  
*Short Talk: The Deubiquitinase OTULIN Restricts M1-Linked Ubiquitin Signaling to Prevent Inflammation and Autoimmunity*

**Patricia Brazeo**, Northwestern University, USA  
*Short Talk: LUBAC Mediated Epithelial Signaling During Influenza Infection*

**Marion MacFarlane**, MRC Toxicology Unit, UK  
*FADD: Caspase-8 Signalling Complexes and Co-ordinated Control of Life/Death Decisions*

**Pascal Meier**, Institute of Cancer Research, UK  
*Ubiquitin Signaling in Cell Death and Inflammation*

**Nader Yatim**, Institut Pasteur, France  
*Short Talk: RIPK3 in Dendritic Cells Promotes Cross-Priming Upon Stimulation with dsRNA*

**Todd Douglas**, McGill University, Canada  
*Short Talk: Caspase-Mediated Cleavage of HOIP Terminates LUBAC Function and Promotes Cell Death*

### Fatty Acids and Metabolic Signaling (E4)

\***Edward J. Pearce**, Max Planck Institute of Immunobiology and Epigenetics, Germany

**Erika L. Pearce**, Max Planck Institute of Immunobiology and Epigenetics, Germany  
*Mitochondrial Priming By CD28*

**Dan R. Littman**, HHMI/New York University School of Medicine, USA  
*Regulation of ROR $\gamma$ t Function in Lymphocytes*

**Laurence A. Turka**, Massachusetts General Hospital, USA  
*Short Talk: Maintenance of CD4+ T Cell Metabolic Fitness through Regulation of Foxo1*

**Tim D. Sparwasser**, Institute of Infection and Immunology, Germany  
*Fatty Acid Metabolism in the Development and Function of T Cell Subsets*

**Vijay K. Kuchroo**, Brigham and Women's Hospital, Harvard Medical School, USA

*Metabolic Pathways that Regulate Development of Pathogenic Th17 Cells and Autoimmunity*

**Daniel W. McVicar**, National Institutes of Health, USA  
*Short Talk: Itaconic Acid Mediates Crosstalk between Macrophage Metabolism and Tumor Progression*

### Poster Session 2

#### Inflammatory Signaling II (K2)

\***Eric H. Baehrecke**, University of Massachusetts Medical School, USA

**Ana Martin-Villalba**, DKFZ German Cancer Research Center, Germany  
*CD95 Inflammatory Activities: A Tale of Myeloid Cells and Vessels*

**Domagoj Vucic**, Genentech, Inc., USA  
*Regulation of Inflammatory Cell Death Signaling by RIP Kinases*

**Elizabeth K. Brint**, University College Cork, Ireland  
*Short Talk: Engagement of Fas Differentially Regulates the Production of LPS-Induced Pro-Inflammatory Cytokines and Type I Interferons*

**Igor E. Brodsky**, University of Pennsylvania, USA  
*Short Talk: RIPK1 Kinase-Dependent Apoptosis Promotes Antibacterial Immunity in Response to Pathogen Inhibition of Inflammatory Signaling*

**Cristina Giogha**, University of Melbourne, Australia  
*Short Talk: A Bacterial Cysteine Protease Effector Targets RHIM Proteins to Block Host Immune Signaling*

### Mitochondria as Platforms for Key Intracellular Signaling (E4)

\***Douglas R. Green**, St. Jude Children's Research Hospital, USA

**Navdeep S. Chandel**, Northwestern University, USA  
*Mitochondria as Signaling Organelles*

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**Gerald S. Shadel**, Yale School of Medicine, USA  
*A Mitochondrial DNA Stress-Induced ISG Response*

**David Artis**, Cornell University, USA  
*Immune Regulation at Barrier Surfaces*

**Mercedes Rincon**, University of Vermont, USA  
*Short Talk: MCJ (DnaJC15) Negatively Regulates CD8+ T Cell Mitochondrial Respiration and Immune Effector Functions*

**Ping-Chih Ho**, University of Lausanne, Switzerland  
*Short Talk: Integration of alpha-Ketoglutarate/Succinate Balance Controls Macrophage Polarization through Immunometabolic and Epigenetic Reprogramming*

### THURSDAY, JUNE 1

#### Tissue Responses to Dying Cells (K2)

\***Thomas Brunner**, University of Konstanz, Germany

**Julie Magarian Blander**, Weill Cornell Medicine, Cornell University, USA  
*Phagocyte Responses to Dying Cells*

**Eric H. Baehrecke**, University of Massachusetts Medical School, USA  
*Inflammatory Signaling, Autophagy and Dying Cell Clearance*

**Thomas H. Oguin**, National Institute of Environmental Health Sciences, USA  
*Short Talk: LC3-Associated Phagocytosis Is Required to Defend Against Environmental Bacterial Infection*

**Ed C. Lavelle**, Trinity College Dublin, Ireland  
*Role of IL-1 Family Cytokines in Adjuvanticity*

**Shigekazu Nagata**, IFRc, Osaka University, Japan  
*Exposure of Phosphatidylserine to the Cell Surface*

**Akira Shibuya**, University of Tsukuba, Japan  
*Short Talk: Apoptotic Epithelial Cells Control Regulatory T Cell Expansion*

**Conor J. Kearney**, Peter MacCallum Cancer Centre, Australia  
*Short Talk: IAP Antagonists Promote Cytotoxic Lymphocyte Anti-Tumor Immunity*

#### Interplay between mTOR/AMPK Signaling and Cell Metabolism (E4)

\***Laurence A. Turka**, Massachusetts General Hospital, USA

\***Mercedes Rincon**, University of Vermont, USA

**Giuseppe Matarese**, Università degli Studi di Napoli Federico II, Italy  
*Metabolic Control of Immune Tolerance and Autoimmune Diseases*

**Jonathan D. Powell**, Johns Hopkins University School of Medicine, USA  
*mTOR Signaling in T Cell Fate, Activation and Metabolism*

**Bin Li**, Shanghai Institute of Immunology, China  
*Short Talk: Regulation of Treg Cell Metabolism and Function by Pkm2 and Foxp3*

**Hongbo Chi**, St. Jude Children's Research Hospital, USA  
*mTORC1 Signaling and Systems Proteomics in T Cell Metabolic Reprogramming*

**Russell G. Jones**, McGill University, Canada  
*Rethinking Metabolic Reprogramming in T Cells*

**Jeroen Roose**, University of California, San Francisco, USA  
*Short Talk: Tonic Signals to Regulate Transcriptional, Translational, and Metabolic Programs in CD4 T Cells*

#### Poster Session 3

#### Stress Signals and Inflammation (K2)

\***Cristina Muñoz-Pinedo**, Institut d'Investigació Biomedica de Bellvitge, Spain

**Junyung Yuan**, Harvard Medical School, USA  
*The Role and Mechanism of RIPK1 in Cell Death and Neurodegeneration*

**Kevin M. Ryan**, Beatson Institute for Cancer Research, UK  
*The p53 Pathway and Inflammation*

**Erwin F. Wagner**, Spanish National Cancer Research Centre, Spain  
*Stress Signaling in Inflammation and Cancer*

**Lisa Bouchier-Hayes**, Baylor College of Medicine, USA  
*Short Talk: Caspase-1 and Caspase-5 Are Differentially Activated by Extracellular Heme*

**Joanna Majkut**, Queen's University Belfast, UK  
*Short Talk: Development and Pre-Clinical Assessment of a First-in-Class Small Molecule Inhibitor of FLIP*

**Adam Lacy-Hulbert**, Benaroya Research Institute, USA  
*Short Talk: A Forward Genetic Screen to Identify Mechanisms of Resistance to Caspase-Mediated Cell Death Induced by Pore-Forming Toxins*

#### Immune-Tissue Interaction in Inflammation and Metabolic Disease (E4)

\***Vijay K. Kuchroo**, Brigham and Women's Hospital, Harvard Medical School, USA

**Axel Kallies**, Walter and Eliza Hall Institute of Medical Research, Australia  
*Molecular Regulation of Adipose Tissue-Resident Regulatory T Cell Development*

**Lydia Lynch**, Harvard Medical School, USA  
*The Interdependence of Systemic and Cellular Metabolism in Innate Immunity*

**David K. Finlay**, Trinity Biomedical Sciences Institute, Ireland  
*Short Talk: Fueling Natural Killer Cell Anti-Tumor Responses*

**Richard M. Locksley**, HHMI/University of California, San Francisco, USA  
*Innate Helper Type 2 Cells (ILC2s) and Intestinal Homeostasis*

**Giuseppe Danilo Norata**, University of Milan, Italy  
*Short Talk: Dendritic Cells' Derived Apolipoprotein E Orchestrates Adaptive Immune Response by Controlling Cellular Lipid Metabolism*

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### FRIDAY, JUNE 2

#### Alternative Cell Death Modalities and Inflammation (K2)

\***Domagoj Vucic**, Genentech, Inc., USA

**Arturo Zychlinsky**, Max Planck Institute for Infection Biology, Germany  
*NETosis and Inflammation*

**Thomas Brunner**, University of Konstanz, Germany  
*Extra-Adrenal Synthesis of Immunoregulatory Glucocorticoids and its Implication in Local Tissue Homeostasis, Inflammation and Cancer*

**Ling-Ling An**, MedImmune, Inc., USA  
*Short Talk: ICs-Induced NETosis Requires PAD4 but Not Histone Citrullination*

**Cristina Muñoz-Pinedo**, Institut d'Investigació Biomedica de Bellvitge, Spain

*Short Talk: Glucose Deprivation Induces ATF4-Mediated Apoptosis through TRAIL Death Receptors*

**Kim Newton**, Genentech, Inc., USA  
*Regulation of Cell Death by RIPK1 and Caspase-8*

**Kate Schroder**, University of Queensland, Australia  
*Myeloid Cell Identity Shapes Inflammasome Signaling Pathways and Cell Death Decisions*

**Jerome Estaquier**, CHU de Québec Research Center Infectious Disease Research Center, Canada

*Short Talk: Anti-apoptosis Agent Prevents AIDS*

**James M. Murphy**, Walter and Eliza Hall Institute of Medical Research, Australia

*Short Talk: Mechanistic Studies of How the Pseudokinase, MLKL, Is Activated and Kills Cells by Necroptosis*

#### Nutrient Sensing and Signaling in Immune Microenvironment (E4)

\***Joel D. Schilling**, Washington University School of Medicine, USA

**Mark A. Febbraio**, Garvan Institute of Medical Research, Australia  
*How Do Macrophages Sense Nutrient Overload to Induce an Inflammatory Response?*

**Susan M. Kaech**, Yale University School of Medicine, USA  
*Anti-Tumor T Cells – You Are What You Eat*

**Laurence Morel**, University of Florida, USA  
*Short Talk: Unique Requirement of High Levels of Glucose Metabolism by Autoreactive Follicular Helper T Cells*

**Janelle S. Ayres**, The Salk Institute for Biological Studies, USA  
*Gut Microbe, Growth Factor Signaling and Metabolic Regulation of Wasting Disease*

**Mala Maini**, University College London, UK  
*Metabolic Regulation of T Cell Immunity in Viral Hepatitis*

**Andreas Bergthaler**, Austrian Academy of Sciences, Austria

*Short Talk: Systemic Crosstalk of Metabolism and Inflammation in Viral Infection*

#### Workshop 2: Importance of Metabolic Reprogramming in in vivo Functioning of the Immune System and Immune-Mediated Diseases (E4)

\***Martin Thurnher**, Medical University of Innsbruck, Austria

\***Julian J. Lum**, British Columbia Cancer Agency, Canada

**Jennifer Martinez**, NIEHS, National Institutes of Health, USA

*LC3-Associated Phagocytosis Links Efferocytosis to Inflammation and Metabolism*

**Rianne G. J. W. van der Windt**, Academic Medical Center, Netherlands

*Impact of Signals from the Tumor Microenvironment on Chronic Lymphocytic Leukemia Metabolism*

**Sagar P. Bapat**, University of California, San Francisco, USA

*PPARγ Activation Suppresses Th2-Driven Atopic Disease via Metabolic Reprogramming*

**Rafael de Queiroz Prado**, NIAID, National Institutes of Health, USA

*The L-Arginine Transporter Slc7a2 Regulates Asthma Pathogenesis by Inhibiting Inflammasome Activation in Non-Hematopoietic Cells*

**Andrea J. Wolf**, Cedars-Sinai Medical Center, USA

*A Role for the Glycolytic Enzyme, Hexokinase, in Innate Immune Sensing by the NLRP3 Inflammasome*

**Autumn G. York**, Yale University, USA  
*Synthesis of Mono-Unsaturated Fatty Acids Negatively Regulates Inflammation*

**Bin Zheng**, Massachusetts General Hospital, Harvard Medical School, USA

*Targeting Metabolic Vulnerabilities of MDSCs to Enhance the Anti-Tumor Activity of PD-1 Blockade*

**Bart Everts**, Leiden University Medical Center, Netherlands

*LKB1 Expressed in Dendritic Cells Governs the Development of Thymus-Derived Regulatory T Cells*

**Richard A. Flavell**, HHMI/Yale University School of Medicine, USA  
*Immunometabolism*

**Daniel Mucida**, Rockefeller University, USA  
*Intestinal Epithelial and Intraepithelial T Cell Crosstalk Mediates a Dynamic Response to Infection*

#### Closing Keynote Address (K2)

\***Seamus J. Martin**, Trinity College Dublin, Ireland

**Douglas R. Green**, St. Jude Children's Research Hospital, USA  
*Cell Death as a Key Modulator of Inflammation: What Are the Key Factors?*

#### Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (K2)

#### Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (E4)

### SATURDAY, JUNE 3

#### Departure

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### Inflammation and Cancer (K2)

**\*Peter Vandenabeele**, VIB, Ghent University, Belgium

**Frances R. Balkwill**, Barts Cancer Institute, Queen Mary University of London, UK  
*Inflammation in the Tumor Microenvironment*

**Scott W. Lowe**, Memorial Sloan Kettering Cancer Center, USA  
*Inflammatory Regulators and Cancer Progression*

### Microbiota Metabolism and Immune Cell Functions (E4)

**\*Laurence Morel**, University of Florida, USA

**Yasmine Belkaid**, NIAID, National Institutes of Health, USA

*White Adipose Tissue is a Hub for Memory T Cells and Promotes Memory Responses*