KEYSTONE SYMPOSIA  
on Molecular and Cellular Biology  

**Neuro-Immune Interactions in the Central Nervous System (Z1)**  
**Scientific Organizers:** Marco Colonna, Shilpa Sambashivan and Michael T. Heneka  
Supported by the Directors’ Fund  

**Neurodegeneration: The Biological Pathways Driving the Future of Therapeutic Development (Z2)**  
**Scientific Organizers:** Dimitri Krainc and Alfred W. Sandrock Jr.  
June 5-9, 2022 • Keystone Resort • Keystone, CO, USA  
Supported by the Directors’ Fund  

Scholarship Deadline: February 22, 2022 / Abstract Deadline: March 1, 2022 / Discounted Registration Deadline: April 5, 2022

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**SUNDAY, JUNE 5**  
Arrival and Registration

**MONDAY, JUNE 6**  
**Welcome and Keynote Session (Joint)**  
- **Rudolph E. Tanzi†,** Massachusetts General Hospital, USA  
  New Insights into Pathogenesis and Therapeutics Options in Alzheimer’s Disease  
- **Thomas C. Südhof,** Stanford School of Medicine, USA  
  Synapse Biology in Alzheimer’s Disease  

**Genetics of Neuro-Immune Interactions (Joint)**  
- **John Hardy,** University College London, Institute of Neurology, UK  
  Identifying Genetic Variants Contributing to Neurodegenerative Diseases  
- **David Sulzer,** Columbia University, USA  
  Inflammation and Immunity in Parkinson’s Disease  
- **Alison Goate†,** Icahn School of Medicine at Mount Sinai, USA  
  Alzheimer’s Disease Susceptibility Alleles Implicate Endolysosomal Function in Microglia  

**Short Talk(s) Chosen from Abstracts**  

**Workshop 1: Imaging of the CNS in Health and Disease (Z1)**  
**Short Talks Chosen from Abstracts**  

**Understanding Immune Receptors in the CNS (Z1)**  
- **Greg E. Lemke,** The Salk Institute for Biological Studies, USA  
  TAM Receptor Regulation of Neurodegenerative Disease  
- **Shilpa Sambashivan,** Proneurotech, Inc., USA  
  Intracellular Receptors for NAD in Neurodegeneration  
- **Marco Colonna,** Washington University School of Medicine, USA  
  ITAM Signaling in Neurodegeneration  

**Short Talks Chosen from Abstracts**

**Synaptic Mechanisms and Molecular Events (Z2)**  
- **Pietro V. De Camilli,** Yale University School of Medicine, USA  
  Synaptic Membrane Endocytosis  
- **Morgan H. Sheng,** Broad Institute, USA  
  Mechanisms of Synapse Loss in Neurodegenerative Disease  
- **Maria Grazia Spillantini,** University of Cambridge, UK  
  Synaptic Dysfunction in Parkinson’s Disease  
- **Volker Haucke,** Leibniz Forschungsinstitut für Molekulare Pharmakologie, Germany  
  Synaptic Vesicle Exo-Endocytosis and Reformation  

**Short Talk(s) Chosen from Abstracts**

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**TUESDAY, JUNE 7**  
**Microglia, Other Glial Cells and Macrophages in Neurodegenerative Diseases (Z1)**  
- **Michael T. Heneka,** German Center for Neurodegenerative Diseases, Germany  
  Detrimental Effects of Inflammasome Activation and ASC Spec as a Plaque Nucleating Event in Alzheimer’s Disease  
- **Rosa C. Paolicelli,** University of Lausanne, Switzerland  
  Metabolic Control of Microglial Function  
- **Marco Prinz,** University of Freiburg, Germany  
  Brain Macrophages in Neurodegenerative Diseases  

**Speaker to be Announced**  

**Short Talks Chosen from Abstracts**

**Autophagy and Disease (Z2)**  
- **Ivan Dikic,** Goethe University Medical School, Germany  
  ER-phagy: From Molecular Principles to Pathogenesis of Neuropathies  
- **Xinnan Wang,** Stanford University School of Medicine, USA  
  Redox Mechanisms in Aging and Neurodegeneration.  
- **Myriam Heiman,** Massachusetts Institute of Technology, USA  
  Genome-wide in vivo CNS Screening Identifies Genes that Modify CNS Neuronal Survival and Mutant Huntingtin Toxicity  
- **Ai Yamamoto†,** Columbia University, USA  
  Selective Autophagy in the CNS  

**Short Talk(s) Chosen from Abstracts**

**Workshop 2: IPSC and Organoids for the Study of Neurodegeneration (Z1)**  
**Short Talks Chosen from Abstracts**

**The Role of Brain Immune System in Shaping the CNS connectivity (Z1)**  
- **Jun R. Huh,** Harvard Medical School, USA  
  Impact of Gut Bacteria in Neurodevelopmental Abnormalities  
- **Katerina Akassoglou,** University of California, San Francisco, USA  
  Microglia Regulation of Brain Network Hyperexcitability.  
- **Anne Schaefer,** Mount Sinai School of Medicine, USA  
  Control of Neuronal Activity by Microglia  

**Short Talks Chosen from Abstracts**

**Endolysosomal Dysfunction in Neurodegeneration (Z2)**  
- **Dimitri Krainc,** Northwestern University, USA  
  Convergence of Mitochondrial and Lysosomal Dysfunction  
- **Ralph A. Nixon†,** New York University, Langone Medical Center, USA  
  Defective Endolysosomal Function in Disease  

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* Session Chair † Invited but not yet accepted  
Program current as of **May 4, 2021**. Meal formats are based on meeting venue.  
For the most up-to-date details, visit [https://www.keystonesymposia.org](https://www.keystonesymposia.org).
Natural Text:

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Roberto Zoncu, University of California, Berkeley, USA
mTOR and Lysosomes in Nutrient Sensing and Growth Control
Short Talk(s) Chosen from Abstracts

Poster Session 2

WEDNESDAY, JUNE 8

Application of Next Generation Technologies to Profile Neuro Immune Interactions (Z1)
Frederic Geissmann, Memorial Sloan Kettering Cancer Center, USA
Mosaicism in the Central Nervous System and Neurodegeneration
Li-Huei Tsai, Massachusetts Institute of Technology, USA
The Use of Induced Pluripotent Stem Cells to Model Alzheimer’s Disease
Ido Amit†, Weizmann Institute, Israel
The Power of ONE: Immunology in the Age of Single Cell Genomics
Christopher K. Glass, University of California, San Diego, USA
Decoding Microglia Enhancers in Health and Disease
Short Talks Chosen from Abstracts

Mitochondrial Defects in Neurodegeneration (Z2)
Dalton James Surmeier, Northwestern University, USA
Bioenergetic Determinants of Selective Neuronal Vulnerability in Parkinson’s Disease
Richard J. Youle, NINDS, National Institutes of Health, USA
Neuroinflammation Stemming from Mitochondrial DAMPs Linked to Parkinson’s Disease’s Genes and Mitophagy Defects
Yvette C. Wong, Northwestern University, USA
Mitochondria-Lysosome Contact Sites: Roles and Regulation in Homeostasis and Neurodegenerative Diseases
Short Talk(s) Chosen from Abstracts

Workshop: Cellular Pathways Driving Disease (Z2)

Short Talks Chosen from Abstracts

Brain Immune System in Neuroinflammation (Z1)
Menna Clatworthy†, University of Cambridge, UK
Plasma Cells in the Meninges
Melanie Greter†, University of Zurich, Switzerland
Non-parenchymal Brain Macrophage in Neuroinflammation
Francisco J. Quintana, Harvard Medical School and the Broad Institute of MIT and Harvard, USA
Impact of Aryl Hydrocarbon Receptor in Multiple Sclerosis
Short Talks Chosen from Abstracts

Neuronal Pathways in Disease (Z2)
David M. Holtzman, Washington University, USA
Innate Immunity, ApoE, and Neurodegeneration
Virginia M. Y. Lee, University of Pennsylvania School of Medicine, USA
Pathogenic Neuronal Mechanisms in Parkinson’s and Alzheimer’s Disease
Martin Kampmann, University of California, San Francisco, USA
CRISPR-based Functional Genomics for Neurological Disease
Danielle Posthuma, Vrije Universiteit Amsterdam, Netherlands
BrainScapes
Short Talk(s) Chosen from Abstracts

Poster Session 3

THURSDAY, JUNE 9

Blood Brain Barrier (BBB), Glymphatics and Lymphatics (Z1)
Jonathan Kipnis, Washington University School of Medicine, USA
Meningeal Sinuses and Lymphatics in the Epicenter of CNS Immune Surveillance
Zsuzsanna Fabry†, University of Wisconsin, USA
BBB in Brain Infections
Berislav Zlokovic, University of Southern California, USA
Pericytes Play an Important Role in Maintaining the BBB
Chenghua Gu, Harvard Medical School, USA
Lipid Transport-Dependent Suppression of Caveolae-Mediated Transcytosis in BBB
Short Talks Chosen from Abstracts

Translational Considerations in Neurodegenerative Research (Z2)
Alfred W. Sandrock Jr., Biogen Idec, Inc., USA
Introduction “Challenges of going from Bench to Bedside in Neurology”
Richard Hargreaves†, Bristol-Myers Squibb, USA
Moving Drug Candidates from Drug Discovery into First-in-Human Studies
Carole Ho, Denali Therapeutics Inc., USA
Phase 2 Trial Design Considerations: How to Achieve Proof of Biology and Proof of Efficacy
Short Talk(s) Chosen from Abstracts

Workshop 3: Immunotherapy of Neurodegeneration (Z1)

Short Talks Chosen from Abstracts

Aging, Metabolism and Neurodegeneration (Z1)
Katrin Andreasson, Stanford University, USA
Myeloid Cell Metabolism in Aging
Tony Wyss-Coray, Stanford University School of Medicine, USA
Systemic Regulation of Brain Aging

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Douglas R. Green, St. Jude Children’s Research Hospital, USA
*Autophagy in Alzheimer’s Disease*

**Short Talks Chosen from Abstracts**

**Future Directions for Therapeutics (Z2)**

Anabella Villalobos, Biogen, USA
*Small Molecule Therapeutics for CNS*

C. Frank Bennett†, Ionis Pharmaceuticals, Inc., USA
*Oligonucleotide-based Therapeutic Approaches*

Speaker to be Announced

**Short Talk(s) Chosen from Abstracts**

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z1)**

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z2)**

**FRIDAY, JUNE 10**

**Departure**