



Join Keystone Symposia
for the 2016 conference on:

Common Mechanisms of Neurodegeneration

June 12–16, 2016

Keystone Resort | Keystone, Colorado | USA

Scientific Organizers:

Bradley T. Hyman, Adriano M. Aguzzi and Ricardo E. Dolmetsch

*Joint with the conference on **Microglia in the Brain***

Recent advances in understanding the genetics and underlying mechanisms of neurodegenerative diseases including prion diseases, Alzheimer's, Parkinson's, ALS and frontotemporal dementia have revealed overlaps of phenotypes, genetic risks and biological mechanisms across this spectrum of disorders. The "common mechanisms" include protein templating, glial and inflammatory mechanisms, new understanding of RNA-based toxicity and of toxicity associated with protein misfolding, and common downstream mechanisms affecting synaptic function. Moreover, because there appear to be common mechanisms at play, recent progress in therapeutic approaches targeting one of these disorders may have applicability across the whole range of disorders. This conference will enable the in-depth exploration of these various aspects of commonality across neurodegenerative disorders.

Session Topics:

- Prions and "Prionoid" Molecules
- Protein Templating and Spread of Neuropathology
- New Treatment Modalities
- Role of Glia
- RNA and New Mechanisms of Toxicity

- Inflammatory Mechanisms
- Unfolded Proteins
- Synaptic Dysfunction in AD, Neurodegenerative Disease, and Developmental Disorders
plus a workshop



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: Feb 11, 2016

Abstract Deadline: Mar 10, 2016

Discounted Registration Deadline: Apr 12, 2016

For additional details, visit www.keystonesymposia.org/16Z3.

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KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Common Mechanisms of Neurodegeneration (Z3)

Scientific Organizers: Bradley T. Hyman, Adriano M. Aguzzi and Ricardo E. Dolmetsch

Sponsored by BioLegend, Inc., Curemark LLC, FORUM Pharmaceuticals Inc., Merck & Co., Inc., Sangamo BioSciences, Inc. and Takeda Pharmaceutical Company Limited

Microglia in the Brain (Z4)

Scientific Organizers: Beth Stevens and Richard M. Ransohoff

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SUNDAY, JUNE 12

Arrival and Registration

MONDAY, JUNE 13

Welcome and Keynote Address (Z3)

***Bradley T. Hyman**, Massachusetts General Hospital, USA

Laura Ranum, University of Florida, USA

Repeat Associated Non-ATG (RAN) Translation: New Starts and Directions in Neurologic Disease

Welcome and Keynote Address (Z4)

***Beth Stevens**, Boston Children's Hospital, Harvard Medical School, USA

Christopher K. Glass, University of California, San Diego, USA
The Nature and Nurture of Macrophage Identity and Function

Prions and "Prionoid" Molecules (Z3)

Beat H. Meier, ETH Zürich, Switzerland

Atomic-Resolution Structures of Amyloids: HET-s and Different Polymorphs of Amyloid Beta: What Can We Learn?

***Adriano M. Aguzzi**, University Hospital of Zürich, Switzerland
Prion Toxicity

Tuomas Knowles, University of Cambridge, UK
Kinetics of Protein Aggregation

Kristen Anne Davenport, Colorado State University, USA
Short Talk: Dissecting the Role of the PrP Amino Terminus in Species Barriers

Genetics to Pathogenesis (Z4)

***Richard M. Ransohoff**, Third Rock Ventures, USA

Zbigniew K. Wszolek, Mayo Clinic College of Medicine, USA
Adult-Onset Leukoencephalopathy with Axonal Spheroids and Pigmented Glia due to CSF1R gene Mutations: Clinical, Radiological, Pathological and Genetic Correlations

Steven G. Younkin, Mayo Clinic Jacksonville, USA
Association of Variants in Microglial Genes with Neurodegenerative Disease

Karel Otero Gutierrez, Biogen, USA
Investigating the Functions of TREM2 in Neurodegeneration

Michael W. Salter, Hospital for Sick Children and University of Toronto, Canada
Sexual Dimorphism in Microglia-Neuron Signaling in Pain Neuroplasticity

Protein Templating and Spread of Neuropathology (Z3)

Mathias Jucker, Hertie-Institute for Clinical Brain Research and DZNE, Germany
Proteopathic Seeds in Neurodegenerative Diseases

***Bradley T. Hyman**, Massachusetts General Hospital, USA
Neuroanatomy and Consequences of Pathological Propagation in Neurodegeneration

Virginia M. Y. Lee, University of Pennsylvania School of Medicine, USA

New Tauopathy Mouse Models for Alzheimer's Disease

Microglia Surveillance in Real Time: Lessons from in vivo Imaging (Z4)

***Marie-Ève Tremblay**, Laval University, Canada

David Attwell, University College London, UK

An Ion Channel Regulating Microglial Surveillance of the Brain Parenchyma

Dimitrios Davalos, Lerner Research Institute, Cleveland Clinic, USA
Microglial Responses to Blood Brain Barrier Breakdown

Francesca Peri, European Molecular Biology Laboratory, Germany
Microglia Go Live: The Role Neuronal-Microglial Interactions in the Development and Repair of the CNS

Courtney N. Easley-Neal, Eisai, USA

Short Talk: Cerebral Cortex Targeted Depletion of Microglia, via CSF1R Ligand Inhibition, as a Potential Approach to Mitigate Neurodegeneration in Alzheimer's Disease

Deborah Kurrasch, University of Calgary, Canada
Short Talk: Microglia Influence Embryonic Development of Hypothalamic Energy Balance Centers

Poster Session 1

TUESDAY, JUNE 14

New Treatment Modalities (Z3)

Christer Nordstedt, Eli Lilly and Company, USA
Future Alzheimer's Therapeutics

***Nathalie Isabelle Cartier-Lacave**, CEA MIRCen, France
Gene Therapy Strategy for Alzheimer's Disease: The Cholesterol Connection

Douglas Golenbock, University of Massachusetts Medical School, USA
The Inflammasome Product IL18 Prevents Amyloid-Induced Fatal Seizures

Fyodor D. Urnov, University of California, Berkeley, USA
Targeted Genome Regulation for Neurodegenerative Disease Therapy

Claire E. Le Pichon, NICHD, National Institutes of Health, USA
Short Talk: Loss of Dual Leucine Zipper Kinase Signaling is Protective in the SOD1 Mouse Model of ALS

William J. Meilandt, Genentech, inc., USA
Short Talk: Loss of Dual Leucine Zipper Kinase Signaling is Protective in the PS2APP Mouse Model of Alzheimer's Disease

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Synaptic Pruning and Plasticity (Z4)

***Staci Bilbo**, Harvard Medical School/MGH, USA

Dorothy Schafer, University of Massachusetts Medical School, USA
Microglia: Dynamic Sensors of Neural Activity and Regulators of Brain Plasticity

Rosa C. Paolicelli, University of Lausanne, Switzerland
TDP-43 Loss in Microglia Promotes Phagocytosis and affects Synaptic Pruning and Motor Behavior in Adult Mice

Brian MacVicar, University of British Columbia, Canada
Synaptic Sensing and Modulation by Microglia

Ryuta Koyama, University of Tokyo, Japan
Short Talk: Fever Activates Microglia to Engulf Inhibitory Synapses in Epilepsy

Ukpong B. Eyo, Mayo Clinic, USA
Short Talk: Bi-Directional Microglial-Neuronal Interactions During Glutamate-Induced Hyperactivity

Poster Session 2

Workshop 1: Ontogeny and Development (Z4)

***Florent Ginhoux**, Singapore Immunology Network, Singapore
Modeling Microglial Differentiation and Function in vitro using Induced Pluripotent Stem Cells

Morgane S. Thion, INSERM U1024, France
In utero Development of Microglia: Intrinsic Programs and Impact of Microbiota

Xianhua Piao, Children's Hospital Boston, USA
Microglial Transglutaminase-2 (TG2) Regulates Oligodendrocyte Development and CNS Myelination through GPR56 Signaling

Huixin Xu, Harvard Medical School and Brigham and Women's Hospital, USA
Environmental Enrichment Potently Prevents Microglia-Mediated Neuroinflammation by Human Amyloid Beta-Protein Oligomers

Workshop 2: Models and Techniques I (Z4)

***Dimitrios Davalos**, Lerner Research Institute, Cleveland Clinic, USA

Steven Marinero, Duke University, USA
3D Brain Tissue-Based Model for Probing Contributions of Microglia and Peripheral Macrophages in Driving Neurodegenerative Disease Mechanisms

Susanna Rosi, University of California, San Francisco, USA
In vivo Metabolic Imaging of Neuroinflammation after TBI

Santiago Sole Domenech, Weill Cornell Medicine, USA
Intravital Imaging of Acidic Compartments in Mouse Brain Microglia

Role of Glia (Z3)

***Don W. Cleveland**, University of California, San Diego, USA

Mechanism and Therapy in ALS and Beyond

Shane Antony Liddel, New York University Langone Medical Center, USA
What Do Reactive Astrocytes Do?

Serge Przedborski, Columbia University, USA
Molecular Mechanism of Motor Neuron Degeneration in Amyotrophic Lateral Sclerosis

Brian V. Lananna, University of Washington in St. Louis, USA
Short Talk: The Astrocyte Circadian Clock Regulates Astroglial and Neuronal Injury

Role in Neurodevelopmental and Neuropsychiatric Disorders (Z4)

***Dorothy Schafer**, University of Massachusetts Medical School, USA

Staci Bilbo, Harvard Medical School/MGH, USA
Modulation of Microglia by Maternal Immune Activation: Relevance for Autism

Mario R. Capecchi, University of Utah, USA
A Causal Role for Defective Microglia in the OCD-Spectrum Disorder, Trichotillomania

Beth Stevens, Boston Children's Hospital, Harvard Medical School, USA
Microglia Function and Dysfunction During Brain Wiring

WEDNESDAY, JUNE 15

Special Lecture (Z4)

Marco Prinz, University of Freiburg, Germany
Origin and Function of CNS Macrophages

RNA and New Mechanisms of Toxicity (Z3)

J. Paul Taylor, St. Jude Children's Research Hospital, USA
Disturbed Phase Transitions Underlie Most Forms of ALS and FTD

Eva-Maria Hock, University of Zürich, Switzerland
Short Talk: Understanding the Involvement of Cellular Stress in the Initiation of TDP-43 and FUS Pathology in Slice Culture Models

Maurice S. Swanson, University of Florida, USA
Dynamic Mutations and RNA-Mediated Disease Mechanisms

***Magdalini Polymenidou**, University of Zürich, Switzerland
The Intertwined Roles of RNA Misregulation and Protein Aggregation in ALS and FTD

Josh Dubnau, Stony Brook University, USA
Short Talk: The Retrotransposon Storm: Retrotransposon Activation Causes Neurodegeneration in a Drosophila TDP-43 Model of Amyotrophic Lateral Sclerosis

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Microglia in Aging and Neurodegenerative Disease (Z4)

***Thomas Möller**, Foundational Neuroscience Center, USA

Marie-Ève Tremblay, Laval University, Canada

Dark Microglia: A New Phenotype Predominantly Associated with Pathological States

Gary E. Landreth, Case Western Reserve University, USA
Nuclear Receptors License the Phagocytic Clearance of Amyloid by Plaque-Associated Macrophages from the AD Brain

Daniel Wilton, Boston Children's Hospital, Harvard Medical School, USA

Short Talk: Microglia Mediate Early Loss of Specific Synaptic Connections in Huntington's Disease

Michelle K. Cahill, University of California, San Francisco, USA
Short Talk: Progranulin Deficiency Promotes Circuit-Specific Synaptic Pruning by Microglia via Complement Activation

Panel: Career Development in Biotech and Pharma (Z4)

Adam W. Bero, Biogen, USA

Irena Kadiu, UCB BioPharma SPRL, Belgium

Morag Stewart, Intellia Therapeutics, USA

Sean P. Cook, Teva Pharmaceuticals, USA

Peter S. DiStefano, Zebra Biologics, Inc, USA

Matthew Kennedy, Merck Research Labs, USA

Inflammatory Mechanisms (Z3)

Gabor Veres, Bluebird Bio, USA

Clinical Study Update on the Efficacy and Safety of Ex Vivo Gene Therapy with Lenti-D Lentiviral Vector for the Treatment of Cerebral Adrenoleukodystrophy

Richard M. Ransohoff, Third Rock Ventures, USA
(Re)Introducing Microglia

Jennifer Lee, Johns Hopkins University, USA
Hypothermia and Rewarming Activate a White Matter Macrogial Unfolded Protein Response Independent of Hypoxia-Ischemia in a Piglet Model

Profiling Resident Microglia in Health and Disease (Z4)

***Marco Prinz**, University of Freiburg, Germany

Shane Antony Liddelow, New York University Langone Medical Center, USA
Identification of Novel Microglia-Specific Markers in Healthy Mouse Brain

Joseph El Khoury, Massachusetts General Hospital, USA
Deep Sequencing Brain Microglia Reveals Unique Molecular Fingerprints

Erik H.W.G.M. Boddeke, University of Groningen, Netherlands
Human and Mouse Microglia Transcriptomes Related to Neurodegeneration and Aging

Brad A. Friedman, Genentech, Inc., USA
Short Talk: The Transcriptional Landscape of Brain Myeloid Cells Reveals Gene Expression Responses Associated with Proliferation, Interferon Signaling and Neurodegeneration

Poster Session 3

THURSDAY, JUNE 16

Unfolded Proteins (Z3)

***Richard I. Morimoto**, Northwestern University, USA
Proteostasis Disruptions in Aging and Neurodegenerative Disease

David Eisenberg, University of California, Los Angeles, USA
Structural Studies of Toxic and Non-Toxic Amyloid Proteins

Gordon P. Meares, West Virginia University, USA
Short Talk: Targeting PERK for Selective Immunomodulation in the CNS

Christoph Gericke, University of Zurich, Switzerland
Short Talk: The Influence of Alzheimer's Disease-Like Cerebral Amyloidosis on Brain Immune Surveillance

David Christopher Wirthensohn, University of Cambridge, UK
Short Talk: Detecting and Characterizing Individual Aggregates in Human CSF

Microglia Regulation of Pain and Neuronal-Glia Interactions (Z4)

***Francesca Peri**, European Molecular Biology Laboratory, Germany

Richard M. Ransohoff, Third Rock Ventures, USA
The Fractalkine Story: An Update

Sonia Garel, INSERM, France
Microglia and Prenatal Inflammation in the Development of Cortical Inhibitory Circuits

Amanda Sierra, Achucarro Basque Center for Neuroscience, Spain
Short Talk: Of Ghost Cells and Ravenous Microglia: Coupling between Apoptosis and Microglial Phagocytosis in Health and Disease

Makoto Tsuda, Kyushu University, Japan
Spinal Microglia Activated by Purinergic Signaling and Neuropathic Pain

Marzia Malcangio, King's College London, UK
Neural-immune Interactions in Chronic Pain Mechanisms

Tuan Trang, University of Calgary, Canada
Short Talk: Pain, Poppies, and Pannexin-1 Channels on Microglia

Workshop 3: Models and Techniques II (Z4)

***Beth Stevens**, Boston Children's Hospital, Harvard Medical School, USA

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Julien A. Muffat, Whitehead Institute for Biomedical Research, USA
Modeling Neuro-Immune Interactions in CNS Disorders using Patient iPS-Derived Microglia-Like Cells

Ana Badimon, Mount Sinai School of Medicine, USA
Brain Region Specific Microglia Specification

Edsel M. Abud, University of California, Irvine, USA
Generating Microglia from Human iPSCs to Study Alzheimer's Disease

Petr Tvrdik, University of Virginia, USA
Imaging and Analysis of Intracellular Calcium Dynamics in Cortical Microglia Responding to Injury

Brainstorming and Open Discussion (Z4)

***Beth Stevens**, Boston Children's Hospital, Harvard Medical School, USA

Synaptic Dysfunction in AD, Neurodegenerative Disease, and Developmental Disorders (Z3)

Tara L. Spire-Jones, University of Edinburgh, UK
Dynamic Synaptic Alterations Due to Amyloid Beta and Tau

***Ricardo E. Dolmetsch**, Novartis Institutes for BioMedical Research, USA
Synaptic Alterations as a Drug Target

Special Lectures (Z4)

***Richard M. Ransohoff**, Third Rock Ventures, USA

Adriano M. Aguzzi, University Hospital of Zürich, Switzerland
Immunological Aspects of Prion Diseases

Thomas Möller, Foundational Neuroscience Center, USA
Translating Microglial Biology: Promise and Problems

Closing Keynote Address (Z3)

Beth Stevens, Boston Children's Hospital, Harvard Medical School, USA
How Microglia Prune Specific Synapses in Health & Disease

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z3)

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z4)

FRIDAY, JUNE 17

Departure