Neurodegenerative Diseases: Genes, Mechanisms and Therapeutics (EK48)

Scientific Organizers: Eric J. Huang, Alison Goate and Richard M. Ransohoff
Sponsored by BlueRock Therapeutics, Cell Research, Genentech, Ionis Pharmaceuticals, Inc. and Ultragenyx Pharmaceutical Inc.

Neurommune Interactions in Health and Disease (EK49)

Scientific Organizers: Beth Stevens, Jonathan Kipnis and Kate Monroe
June 7-9, 2021 • Virtual at your computer
Sponsored by Cell Research, Synthego, and Ultragenyx Pharmaceutical Inc.

MONDAY, JUNE 7
Welcoming Remarks and Keynote Session (Joint) (7am Denver/Mountain Time Start)
*Eric J. Huang, University of California, San Francisco, USA
*Beth Stevens, Boston Children's Hospital, Harvard Medical School, USA
Akiko Iwasaki, Yale University School of Medicine, USA
Exploiting Dynamic Enhancer Landscapes to Infer Pathogenic Mechanisms in Neurodegenerative Diseases

Disease Mechanisms and Therapeutic Targets (Joint) (8:10am Denver/Mountain Time Start)
Holly Kordasiewicz, Ionis Pharmaceuticals, USA
Antisense Oligonucleotides for the Treatment of Neurological Diseases
*Joseph W. Lewcock, Denali Therapeutics, USA
Therapeutic Strategies for the Treatment of Neurodegenerative Disease Based on Human Genetics
*Kate Monroe, Denali Therapeutics, USA
Enhancing Microglia Function with ATV:TREM2
Johan Luthman, Lundbeck, Denmark
Neuroimmunological Target Considerations - To Be or Not To Be in the Brain

Raz Dvir Szternfeld, 150.00
Short Talk: TREM2-Independent Neuroprotection Mediated by Monocyte-Derived Macrophages in a Mouse Model of Alzheimer's Disease

Christiane D. Wrann, Massachusetts General Hospital, USA
Short Talk: Myokine Irisin Is a Critical Regulator of Cognitive Function
Elise Marsan, University of California, San Francisco, USA
Short Talk: Highly Conserved Glial Pathology and Human-Specific Neuronal Pathology Promote Neurodegeneration in FTLD-GRN

Mapping Immune Cell States in Health and Disease (11am Denver/Mountain Time Start) (EK49)
*Francisco J. Quintana, Harvard Medical School and the Broad Institute of MIT and Harvard, USA
*Beth Stevens, Boston Children's Hospital, Harvard Medical School, USA
Mapping Microglia State to Function in Health and Disease
Burkhard Becher, University of Zürich, Switzerland
The T Cell-Myeloid Axis in Neuroinflammation
Shane Antony Liddelow, New York University Langone Medical Center, USA
Redefining Astrocytes States in Health and Disease

Kevin Guttenplan, 150.00
Short Talk: Identification of a Novel Astrocyte Toxic Factor
Frederick Bennett, 275.00
Short Talk: Brain Macrophage Transplantation for Research and Therapy Development

From Therapeutic Targets to Clinic (11am Denver/Mountain Time Start) (EK48)
*Joseph W. Lewcock, Denali Therapeutics, USA
*Charlotte J. Sumner, Johns Hopkins School of Medicine, USA
The Evolving Challenges of Gene Targeted Therapeutics for SMA
Lorenz Studer, Memorial Sloan Kettering Cancer Center, USA
IPSC-Derived Dopaminergic Neurons and Parkinson's Disease Therapy
Priyanka Narayan, National Institute of Health, USA
Short Talk: Discovering and Reversing the Metabolic Consequences of APOE4 in iPSC-Derived Glia

Poster Session 1 (Joint) (1pm Denver/Mountain Time Start)

TUESDAY, JUNE 8
Genetic Contributions to Neurodegeneration (7am Denver/Mountain Time Start) (EK48)
*Valina L. Dawson, Johns Hopkins University School of Medicine, USA
*Alison Goate, Icahn School of Medicine at Mount Sinai, USA
Human Genetics Implicates Microglial Function in Alzheimer's Disease Risk
Jennifer Yokoyama, University of California, San Francisco, USA
Immune Contributions to Early-Onset Neurodegenerative Disease
Martine Therrien, 275.00
Short Talk: Modeling the Impact of AD Genetic Risk on Microglia States and Function
Andy P. Tsai, Indiana University School of Medicine, USA
Short Talk: Impact of PLCG2 Alzheimer's Disease Risk Variants on Microglia Biology and Disease Pathogenesis

Neuroimmune Regulation of Sleep and Brain States (7am Denver/Mountain Time Start) (EK49)
*Jonathan Kipnis, Washington University School of Medicine, USA
*Maria Lehtinen, Harvard Medical School, USA
Maiken Nedergaard, University of Rochester, USA
Sleep Regulation and Disease Roles of the Glymphatic System
David M. Holtzman, Washington University, USA
APOE, Innate Immunity, and Neurodegeneration
Marco Colonna, Washington University School of Medicine, USA
ILCs and Sleep
KEYSTONE SYMPOSIA
on Molecular and Cellular Biology

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Constance Martha Dopp, 150.00
[NOT AVAILABLE ON DEMAND] Short Talk: Aging-Associated Myelin Dysfunction Drives Amyloid Deposition in Alzheimer’s Disease

Cellular Pathways Targeted by Neurodegeneration (8:20am Denver/Mountain Time Start) (EK48)

* Alison Goate, Icahn School of Medicine at Mount Sinai, USA
* Valina L. Dawson, Johns Hopkins University School of Medicine, USA
Mechanism of A-Synuclein-Mediated Neurodegeneration
Christian Hoffmann, 275.00
Short Talk: Synapsin and Synaptic Vesicle Condensates Recruit alpha-Synuclein

Kathryn M. Hixson, UNC Chapel Hill, USA
Short Talk: Cerebellar Degeneration in ARSACS Disease Linked to Tau Hyperphosphorylation and Membrane-Protein Disruption

Noah Johnson, University of Colorado Anschutz Medical Campus, USA
Short Talk: Identification of Small Molecule Drugs that Target Apolipoprotein E4-Catalyzed Amyloid-β Fibrillization: A New Therapeutic Approach to Alzheimer’s Disease

NeuroImmune Crosstalk at Brain Borders (8:30am Denver/Mountain Time Start) (EK49)

* Jonathan Kipnis, Washington University School of Medicine, USA
Lymphatic System Function and Dysfunction
Michal Schwartz, Weizmann Institute of Science, Israel
Boosting Immunity to Combat Alzheimer’s Disease
* Maria Lehtinen, Harvard Medical School, USA
Imaging and Probing Choroid Plexus Influence on Brain Development and Function

Richard Daneman, University of California, San Diego, USA
Control of Blood Brain Barrier Development, Function and Dysfunction

Alec Walker, 150.00
Short Talk: The Meninges Function as a Niche for B Lymphopoiesis in Early Life

Justin Rustenhoven, 275.00
Short Talk: Skull and Vertebral Bone Marrow Are Myeloid Cell Reservoirs for the Meninges and CNS Parenchyma

Gliaal Contributions to Neurodegeneration (10:05am Denver/Mountain Time Start) (EK48)

* Mathew M. Blurton-Jones, University of California, Irvine, USA
Novel Genetic Tools for Studying Myeloid Cells in the CNS

Ádám Dénes, Hungarian Academy of Sciences, Hungary
Microglia Shape Neuronal and Vascular Responses via Compartment-Specific Purinergic Mechanisms

Anne Schaefer, Icahn School of Medicine at Mount Sinai, USA
Control of Neuron Activity by Microglia

* Michael T. Heneka, German Center for Neurodegenerative Diseases, Germany
Inflammasome Activation in Alzheimer’s Disease

Swati Mishra, University of Washington, USA
Short Talk: Depletion of AD Risk Gene Sortilin-Related Receptor (SORL1) Causes Cell-Type Specific Dysfunction of the Endo-Lysosomal Pathway in Human Neurons and Microglia – Implications in Alzheimer’s Disease (AD)

Patrick W. Sheehan, 150.00
Short Talk: Astrocytic BMAL1 Regulates Protein Aggregation in Mouse Models of Alpha-Synuclein and Tau Pathology

Sabina Tahirovic, 275.00
Short Talk: Loss of NPC1 Enhances Phagocytic Uptake and Impairs Lipid Trafficking in Microglia

Immune Mechanisms of Synapse Function and Dysfunction (11:10am Denver/Mountain Time Start) (EK49)

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

* Jonathan Kipnis, Washington University School of Medicine, USA

Dorothy Schafer, University of Massachusetts Medical School, USA
Neural-Immune Crosstalk at the Synapse

Betty Diamond, Feinstein Institute for Medical Research, USA
Autoimmune Mechanisms of Cognitive Dysfunction

Borislav Dejanovic, Broad Institute, USA
Short Talk: Synthetic Proteomics in an AD Mouse Model Reveals Complement-Dependent Synapse Elimination by Astrocytes

Susanna Rosi, 275.00
Short Talk: Novel Microglia-Mediated Mechanisms Underlying Synaptic Loss and Cognitive Impairment after Traumatic Brain Injury

Meet the Editors (Joint) (1:30pm Denver/Mountain Time Start)

Swapnika Ramu, Cell Press, USA

Gabriel A. Gasque, PLOS Biology, USA

Sophie Morgan, Nature Communications, UK

Tim Spencer, Journal of Cell Biology, USA

Networking Lounge (Joint) (2:30pm Denver/Mountain Time Start)

WEDNESDAY, JUNE 9

Phase Separation, Protein Aggregation and Transmission (7am Denver/Mountain Time Start) (EK48)

* Eric J. Huang, University of California, San Francisco, USA

J. Paul Taylor, St. Jude Children's Research Hospital, USA
Phase Separation of RNA Binding Proteins in Neurodegeneration

Sjors Scheres, MRC Laboratory of Molecular Biology, UK
Cryo-EM Structures of Amyloid Filaments from Human Brain

* Session Chair † Invited but not yet accepted Program current as of September 24, 2021.
For the most up-to-date details, visit https://www.keystonesymposia.org.
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*Virginia M. Y. Lee*, University of Pennsylvania School of Medicine, USA

*Tau and A-Synuclein Aggregation and Spreading*

*Alyssa Coyne*, 275.00

*Short Talk: Nuclear Accumulation of CHMP7 Initiates Nuclear Pore Complex Injury and Subsequent TDP-43 Dysfunction in Sporadic and Familial ALS*

*Roberta Romano*, University of Salento, Italy

*Short Talk: Role of RAB7A Mutations in Charcot-Marie-Tooth Type 2B Disease*

**Epigenetics and Transcriptomics of the Aging Brain (8:45am Denver/Mountain Time Start) (EK48)**

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

*Li-Huei Tsai*, Massachusetts Institute of Technology, USA

*Transcriptomic Dissection of Alzheimer’s Disease at the Single Cell Resolution*

*Philipp L. De Jager*, Columbia University Medical Center, USA

*Epigenetics and Systems Biology of Alzheimer's Disease*

*Anne Brunet*, Stanford University, USA

*Neuro-Immune Interactions in the Aging Neurogenic Niche*

*Carlos Cruchaga*, Washington University School of Medicine, USA

*Short Talk: Multi-Tissue High-Throughput Proteomics Profiling for Neurodegenerative Disease*

*Hyo Won Ahn*, 275.00

*Short Talk: Transposable Element Insertions Associated with Risk of Neurologic and Psychiatric Diseases*

**Immune Regulation of Brain Development and Behavior (7am Denver/Mountain Time Start) (EK49)**

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

*Burkhard Becher*, University of Zürich, Switzerland

*Jonathan P. Godbout*, Ohio State University, USA

*The Impact of Social Stress on Immune Cell Trafficking and Neurobehavior*

*Sonia Garel*, INSERM, France

*Microglia and the Crossroads of Cortical Wiring and Environmental Signals*

*Gloria Choi*, Massachusetts Institute of Technology, USA

*Neuroimmune Interactions Shaping Social Behavior*

*Jeffrey Stogsdill*, 275.00

*Short Talk: Pyramidal Neuron Subtype Diversity Governs Microglia States in the Neocortex*

*Jiapai Chen*, 150.00

*Short Talk: Role of Microglia-Vasculature Interaction in Angiogenesis and Germinal Matrix hemorrhage in the Prenatal Brain*

*Jason Shepherd*, 275.00

*Short Talk: The Role of Virus-Like Intercellular Communication in Neuroinflammation*

**Modeling Neuro-Immune Interactions in Neurodegeneration (11am Denver/Mountain Time Start) (EK48)**

*Li-Huei Tsai*, Massachusetts Institute of Technology, USA

*Fred H. Gage*, The Salk Institute for Biological Studies, USA

*Cerebral Organoids and Neurodegeneration*

*Hui-Hsin Tsai*, Biogen, USA

*Multiple Sclerosis Neurorepair – A Drug Discovery Perspective*

*Mathew M. Blurton-Jones*, University of California, Irvine, USA

*Neuro-Immune Interactions in AD Models*

*Emmy Li*, 150.00

*Short Talk: CRISPRi-based Genetic Screens in iPS-Derived 3D Neuron-Astrocyte-Microglia iAssemboids*

**T Cell Brain Communication (9:20am Denver/Mountain Time Start) (EK49)**

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

*Burkhard Becher*, University of Zürich, Switzerland

*Anthony J. Filiano*, Duke University, USA

*T Cell-Neural Interactions in Health and Disease*

*Frauke Zipp*, Johannes-Gutenberg-Universität Mainz, Germany

*Immun Regulatory Processes within the Central Nervous System*

*Celia E. Shiau*, 275.00

*Short Talk: Neutrophil Trafficking to Brain Driven by Peripheral Inflammatory Macrophages Modulates CNS Control of Behavior*

*Stefan Bittner*, 275.00

*Short Talk: Direct Modulation of Neuronal Firing Patterns and Local Networks by Invading Lymphocytes*

*Ethan G. Hughes*, 275.00

*Short Talk: Microglia Engulf Myelin during Immune-Mediated Cortical Demyelination*

**Impact of Peripheral Signals and the Gut Brain Axis (10:55am Denver/Mountain Time Start) (EK48)**

*Burkhard Becher*, University of Zürich, Switzerland

*Daniel Mucida*, Rockefeller University, USA

*The Microbiome as a Modifier of Environmental Risk for Cognitive Impairment*

*Elaine Y. Hsiao*, University of California, Los Angeles, USA

*Neuroregulation of Innate Lymphoid Cells*

*Henrique Veiga-Fernandes*, Champalimaud Research, Portugal

*Neuroregulation of Innate Lymphoid Cells*

*Brian Kim*, Washington University School of Medicine, USA

*Neuroimmune Regulation of Itch*
Francisco J. Quintana, Harvard Medical School and the Broad Institute of MIT and Harvard, USA
*Microbial Regulation of Astrocyte Responses*

Charlotte R. Wayne, 150.00
*Short Talk: Mechanisms of Th17 Cell-Mediated Microglial Activation and BBB Dysfunction in Post-Infectious Basal Ganglia Encephalitis*

Malu G. Tansey, 275.00
*Short Talk: Colitis Disrupts Inflammatory Gene Networks and Nigrostriatal Integrity in the Brain and LRRK2 G2019S Mutant Mice Display Enhanced Vulnerability*

**Poster Session 2 (Joint) (1:30pm Denver/Mountain Time Start)**

Career Roundtable (Joint) (2:30pm Denver/Mountain Time Start)

Holly Kordasiewicz, Ionis Pharmaceuticals, USA
*Holly Kordasiewicz*

Philip L. De Jager, Columbia University Medical Center, USA
*Philip L. De Jager*

Lorenz Studer, Memorial Sloan Kettering Cancer Center, USA
*Lorenz Studer*