

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Neurodegenerative Diseases (Z3)

Scientific Organizers: Leonard Petrucelli, Stacie Weninger and Soyon Hong

Sponsored by Lilly USA, LLC

Neuroimmune Interactions: Nervous System and Immune Cell Heterogeneity in Health and Disease (Z4)

Scientific Organizers: Nicola J. Allen, Anna Victoria Molofsky and Francisco J. Quintana

June 3-6, 2024 • Santa Fe Community Convention Center • Santa Fe, NM, USA

Supported by the Directors' Fund

Scholarship Deadline: February 28, 2024 / Abstract Deadline: February 28, 2024 / Discounted Registration Deadline: April 3, 2024

MONDAY, JUNE 3

Arrival and Registration

TUESDAY, JUNE 4

Welcome and Keynote Session (Joint) (Start 8:00AM)

Tony Wyss-Coray, Stanford University School of Medicine, USA
Aging, the Immune System and Neurodegeneration

Beth Stevens, Boston Children's Hospital, Harvard Medical School, USA
Microglia and the Complement System in Neurodegeneration

Immune-CNS Interactions in Neurodegeneration (Joint) (Start 9:50AM)

Christopher K. Glass, University of California, San Diego, USA
Transcriptional Regulation of Macrophage Development

S. Pablo Sardi, Sanofi, USA
Therapeutic Development for Neurodegenerative Disorders

Anne Schaefer, Icahn School of Medicine at Mount Sinai, MPI Ageing, USA
Epigenetic Regulation of Microglia

Poster Session 1

Workshop 1: Immune-CNS Interactions in Neurodegeneration (Start 2:30PM) (Z3)

Lynn van Olst, Northwestern University, USA
Spatial Transcriptomics Reveals Neuroimmune Mechanisms of A β Clearance in Immunized Alzheimer's Disease Patients

Ravi Jagasia, Pharma Research and Early Development, Switzerland
Genome-wide CRISPR-Cas9 based screening for modifiers of lysosomal GCase activity uncovers candidate risk factors for Parkinson Disease

Georg Werner, Ludwig-Maximilians-Universität München, Germany
Single Cell Analysis Reveals a Neurodegeneration Specific Microglia Population Resistant to CSF1R Inhibition in a Mouse Model with FTLD-like Pathology

Urs Langen, F. Hoffmann-La Roche AG, Switzerland
Beyond the Shuttle: Advances in Brain Delivery of Biologics for the Treatment of Neurodegenerative Diseases

Kyle J. Travaglini, Allen Institute for Brain Science, USA
An Integrated Multimodal Cell Atlas of Alzheimer's Disease

Maylin Fu, Stanford University, USA
Controlling Endogenous mRNA Localization in the Peripheral and Central Nervous Systems in vivo

Philip L. De Jager, Columbia University Medical Center, USA
Human Microglia Expressing High Levels of CD74 Expression are Associated with Activation and Cognitive Decline

Ian Peikon, Cajal Neuroscience, USA

Dire straits: loss of translational regulation of SNCA by iron unifies the genetics of PD and LBD at the SNCA locus

Workshop 1: Communication Across Brain Barriers (Start 2:30PM) (Z4)

Miguel Marin-Rodero, Harvard Medical School, USA
The Meninges Host a Unique Compartment of Regulatory T Cells That Bulwarks Adult Hippocampal Neurogenesis

Nagela Ghabdan Zanluqui, National Institutes of Health, USA
Venous Plexus-Associated Lymphoid Hubs Support Meningeal Humoral Immunity

Nannan Lu, Stanford University, USA
Exploring the Interaction between Blood Plasma Proteins and Microglia: Insights into Brain-Peripheral Communication

Amy Joy Dashwood, University of Cambridge, UK
Novel Genetic Systems Show Feedback from CD4 T Cell Infiltrate in Aged Mouse Brain Shapes and Selects Microglia Populations

Helena Barr, Harvard University, USA
Diurnal Regulation of Brain Border Macrophage Phenotype and Function Across the Lifespan

Tarek Elmzzahi, German Center for Neurodegenerative Diseases, Germany
Identification of a Tissue-Specific Molecular Program Governing the Formation and Function of Brain-Resident CD8⁺ T Cells

Brittany M. Hemmer, Icahn School of Medicine at Mount Sinai, USA
Youth-Associated Plasma Protein TIMP2 Regulates Microglial State in the Context of Aging and Alzheimer's Pathology

Neuroimmune Interactions Relevant to NDD (Start 5:00PM) (Z3)

Kate Monroe, Denali Therapeutics, USA
Leveraging Human Genetics for Novel Therapeutic Approaches for Alzheimer's Disease

Christian Haass, Ludwig-Maximilians University Munich, Germany
PGRN/ApoE

David M. Holtzman, Washington University, USA
Role of APOE in Modulating the Innate and Adaptive Immune Response in Neurodegeneration

August Yue Huang, Boston Children's Hospital, USA
Short Talk: Alzheimer's Disease Microglia Exhibit Enriched Proliferation-related Clonal Somatic Mutations Associated with Inflammatory States

John D. Fryer, Mayo Clinic, USA
Short Talk: Anti-amyloid Immunotherapy Induces Sustained Microglial and Immune Alterations

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Neurodegenerative Diseases (Z3)

Scientific Organizers: Leonard Petrucelli, Stacie Weninger and Soyon Hong

Sponsored by Lilly USA, LLC

Neuroimmune Interactions: Nervous System and Immune Cell Heterogeneity in Health and Disease (Z4)

Scientific Organizers: Nicola J. Allen, Anna Victoria Molofsky and Francisco J. Quintana

June 3-6, 2024 • Santa Fe Community Convention Center • Santa Fe, NM, USA

Supported by the Directors' Fund

Scholarship Deadline: February 28, 2024 / Abstract Deadline: February 28, 2024 / Discounted Registration Deadline: April 3, 2024

Sterile and Pathogen-Mediated Brain Injury (Start 5:00PM) (Z4)

Robyn S. Klein, Washington University School of Medicine, USA
Impact of Viral Infection on CNS Function

William H. Robinson, Stanford University School of Medicine, USA
The Role of EBV in Multiple Sclerosis

Anna-Maria Globig, The Salk Institute for Biological Studies, USA
Short Talk: Sympathetic Nerves Instruct T Cell Exhaustion in Viral Infection and Cancer via the Noradrenaline Receptor ADRB1

Christopher A. Baker, Yale School of Medicine, USA
Short Talk: Novel Infectious and Autoimmune Animal Models of Post-Acute COVID Syndrome Exhibit Central and Peripheral Neuropathology and Behavioral Changes

Elizabeth Balint, McMaster University, Canada
Short Talk: Bystander Activated CD8+ T Cells Mediate Neuropathology During Viral Infection via Antigen-Independent Cytotoxicity

Zeynep Ilgin Kolabas, Helmholtz Center Munich, Germany
Short Talk: Decoding the Neuroimmune Interface: Unique Molecular Insights from Skull Bone Marrow in Health and Disease

WEDNESDAY, JUNE 5

Molecular Mechanisms in NDD (Start 8:00AM) (Z3)

Soyon Hong, University College London, UK
Neuroimmune signaling across gut-brain axis modulates brain synucleinopathy

Speaker to be Announced

Leonard Petrucelli, Mayo Clinic Jacksonville, USA
Tmem/PGRN

Bakhos Tadros, Baylor College of Medicine, USA
Short Talk: LMO7 Modulates Tau Levels by Regulating CHIP-BAG5 Interplay: Novel Insights into Tauopathy Mechanisms

Alexi Nott, Imperial College London, UK
Short Talk: Vascular-immune Epigenetic Mechanisms Underlying Age-related Brain Disorders

Dalya Rosner, Alector, USA
Short Talk: The Alzheimer's Risk Genes MS4A4A and MS4A6A Cooperate to Regulate Key Microglial Functions

Roy R. Parker, HHMI/University of Colorado, USA
Short Talk: Polyserine Domain RNA-binding Proteins as Cellular Factors Enhancing Tau Aggregation

Glial-Immune Interactions (Start 8:00AM) (Z4)

Anna Victoria Molofsky, University of California, San Francisco, USA
Cytokines in CNS Development

Francisco J. Quintana, Harvard Medical School and the Broad Institute of MIT and Harvard, USA
Astrocytes and Inflammatory Signaling

Nicola J. Allen, The Salk Institute for Biological Studies, USA
Astrocyte-Neuron Interactions in Aging and Neurodegeneration

Naomi Habib, Hebrew University of Jerusalem, Israel
Reconstruction of Multi-Cellular Dynamics Underlying Aging and Alzheimer's Disease: One Cell at a Time

Kristine Zengeler, University of Virginia, USA
Short Talk: Astrocyte Inflammasome Signaling Modulates Synaptic Plasticity

Stefan Bittner, University Medical Center Mainz, Germany, Germany
Short Talk: TRPA1 Channels Control Central Nervous System Inflammation via MHC Class II Modulation on Astrocytes

Career Roundtable (Joint) (Start 2:30PM)

Susceptibility vs. Resilience: Understanding Region Vulnerability in NDD (Start 5:00PM) (Z3)

Cagla Eroglu, Duke University Medical Center, USA
In vivo Proteomic Tools TurboID

Henne Holstege, Amsterdam UMC, Netherlands
Cognitively Healthy Centenarians are Genetically Protected Against Alzheimer's Disease

Speaker to be Announced

Guoyan Zhao, Washington University, USA
Short Talk: Transcriptomic Changes in Lewy Body Disease and Alzheimer's Disease Linked to Selective Regional and Neuronal Vulnerability

Mohammad Abbasi, Arizona State University, USA
Short Talk: Unveiling Microglial Heterogeneity in Spatial Context

Immune Regulation of Behavior (Start 5:00PM) (Z4)

Jessica Osterhout, University of Utah School of Medicine, USA
Immune Regulation of Sickness Behavior

Helen Vuong, University of Minnesota, Twin Cities, USA
Talk Title to be Announced

Marco Prinz, University of Freiburg, Germany
Innate Immune Cells at Human CNS Borders Mapped across Space, Time and Perturbation

Anna C. Geraghty, Stanford University, USA
Short Talk: Immunotherapy-Related Cognitive Impairment After CAR T Cell Therapy in Mice

Poster Session 2

THURSDAY, JUNE 6

Modelling Human NDD in a Dish (Start 8:00AM) (Z3)

Tarja Malm, University of Eastern Finland, Finland
Modeling Early Alzheimer's Disease in Human Context

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Neurodegenerative Diseases (Z3)

Scientific Organizers: Leonard Petrucelli, Stacie Weninger and Soyon Hong

Sponsored by Lilly USA, LLC

Neuroimmune Interactions: Nervous System and Immune Cell Heterogeneity in Health and Disease (Z4)

Scientific Organizers: Nicola J. Allen, Anna Victoria Molofsky and Francisco J. Quintana

June 3-6, 2024 • Santa Fe Community Convention Center • Santa Fe, NM, USA

Supported by the Directors' Fund

Scholarship Deadline: February 28, 2024 / Abstract Deadline: February 28, 2024 / Discounted Registration Deadline: April 3, 2024

Paola Arlotta, Harvard University, USA

Human Brain Organoids as Models for Inter-Individual Variation in Disease Susceptibility

Martin Kampmann, University of California, San Francisco, USA

Elucidating Mechanisms and Therapeutic Targets for Neurodegenerative Diseases by CRISPR-Based Functional Genomics

Nilesh Sharma, University of Calgary, Canada

Short Talk: Metabolic Perturbation in Ependymal Cells Leads to Progressive Peri-ventricular Pathology and Recapitulates Alzheimer's Disease Pathogenesis

Jean Paul Chadarevian, UC Irvine, USA

Short Talk: Therapeutic Potential of Human Microglial Transplantation in a Chimeric Model of CSF1R-related Leukoencephalopathy

Lulu Jiang, University of Virginia, USA

Short Talk: The Innovative Neuron-Glial Brain Assembloid Model of Alzheimer's Disease Reveals the Differential Role of ApoE Isoforms in Pathological Tau Propagation

Mireia Gomez-Budia, University of Eastern Finland, Finland

Short Talk: Unravelling LTP-like Synaptic Plasticity in Human Cortical Biopsies on Microelectrode Arrays

Peripheral Immune Signaling and Impact on Neural Circuits (Start 8:00AM) (Z4)

Francesca Odoardi, University Medical Center Göttingen, Germany
Lung Microbiome Regulation of Brain Autoimmunity

Michael D. Burton, University of Texas at Dallas, USA
Neuroimmune Regulation of Pain and Depression

Henrique Veiga-Fernandes, Champalimaud Research, Portugal
Gut Immunity Impacts on Brain Function

Scott J. Russo, Icahn School of Medicine at Mount Sinai, USA
Immune-brain Interactions in Stress and Depression

Yangyang Zhu, Harvard Medical School, USA
Short Talk: A Chemogenetic Screen for Neuroimmune Interplay Reveals Trpv1+ Neuron Control of Tregs in the Gut

Timothy Cox, University of Pennsylvania, USA
Short Talk: Microbiome Regulation of Age-Associated Cognitive Decline

Workshop 2: Steps Toward Precision Medicine for NDD (Start 2:30PM) (Z3)

Jordan D. Marks, Mayo Clinic, USA
TMEM106B Risk SNP Alters Disease Duration and Fibril Deposition in FTLTDP

Zhe Zhang, Johns Hopkins University, USA
PTP α -Mediated PI3P Regulation as a Therapeutic Strategy for C9ORF72-ALS/FTD

Tina Schwabe, Nine Square Therapeutics, USA

Developing Parkin Activators to Enhance Mitochondrial Function for the Treatment of Parkinson's Disease

Francesca Cignarella, FNIH, USA

Enabling a Precision Medicine Approach to Target and Biomarker Discovery in Alzheimer's Disease: Accelerating Medicines Partnership® Alzheimer's Disease (AMP AD)

Tong Wu, Washington University in St. Louis, USA

Targeting SARM1 Inhibition Provides a Promising Therapeutic Strategy for DNA Damage-Induced Neurodegenerative Diseases, Including Amyotrophic Lateral Sclerosis (ALS)

Laura E. Koenig, Harvard Medical School, USA

TYK2 Kinase as a Novel Therapeutic Target in Alzheimer's Disease

Karthik Raju, Denali Therapeutics, USA

GPR34 Loss-of-function Rescues TREM2 Metabolic Dysfunction and Promotes Responsive Microglial States

Jing L. Guo, NICO Therapeutics, USA

Decreased Lipidated ApoE-receptor Interactions Confer Protection against Pathogenicity of ApoE and its Lipid Cargoes

Workshop 2: Neuroinflammation in Aging and Disease (Start 2:30PM) (Z4)

Genevieve Curtin, UCSD, USA

Microglia, Macroproblems: Cellular Dysfunction in Microglia Derived from Down Syndrome Patients

Yingying Zhang, Boston Children's Hospital, USA

Spatial and Temporal Profiling of the Complement System Uncovered Novel Functions of the Alternative Complement Pathway in Brain Development

Sean Ryan, Sanofi, USA

Ferroptosis Activation in Multiple Sclerosis

Gerard Crowley, University College London, UK

Innate-Adaptive Immune Crosstalk Regulates Activity-Dependent Synapse Loss

Qihui Zhou, DZNE Munich, Germany

Microglia Mediated Cerebral Th17/Treg Imbalance Facilitate Neurodegeneration in C9orf72 ALS Mice

Christina Mayer, Institute of Neuroimmunology and Multiple Sclerosis, Germany

Complement Factor H Protects Against Neuronal Ferroptosis in Multiple Sclerosis

Anna Flury, Advanced Science Research Center, CUNY Graduate Center, USA

A Conserved Stress Response Associated with Dark Microglia Drives Neurodegeneration in Alzheimer's Disease

Lara Labarta-Bajo, The Salk Institute, USA

Investigating a Role for Astrocyte Stat1 in the Aged Brain

Designing Better: Steps Toward Precision Medicine for NDD (Start 5:00PM) (Z3)

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Neurodegenerative Diseases (Z3)

Scientific Organizers: Leonard Petrucelli, Stacie Weninger and Soyon Hong

Sponsored by Lilly USA, LLC

Neuroimmune Interactions: Nervous System and Immune Cell Heterogeneity in Health and Disease (Z4)

Scientific Organizers: Nicola J. Allen, Anna Victoria Molofsky and Francisco J. Quintana

June 3-6, 2024 • Santa Fe Community Convention Center • Santa Fe, NM, USA

Supported by the Directors' Fund

Scholarship Deadline: February 28, 2024 / Abstract Deadline: February 28, 2024 / Discounted Registration Deadline: April 3, 2024

Fiona C. Elwood, Janssen R&D, USA

Precision Medicine in Neurodegeneration

Jeremy S. Duffield, Prime Medicine, Inc., USA

Prime Editing as a Curative Therapeutic Approach for Neurodegenerative Diseases

Aimee Jackson, Atalanta Therapeutics, USA

Addressing CNS Indications using a Novel Di-siRNA Modality for Improved Potency, Distribution, and Duration

Aaron D. Gitler, Stanford University School of Medicine, USA

Defining ALS Mechanisms at Single Cell Resolution

Microglia Function (Start 5:00PM) (Z4)

Takahiro Masuda, Kyushu University, Japan

Targeting Microglia for Genetic Manipulation

Borislav Dejanovic, Vigil Neuroscience, USA

Microglia Therapeutics for Neurodegeneration

Long-Jun Wu, University of Texas Health Science Center, USA

Short Talk: Microglia promote neuronal activity via shielding inhibitory synapses

Wangchao Xu, Washington University in St. Louis, USA

Short Talk: A Microbe-Neuroendocrine- Immune Axis in Health, Aging, and Infection

Hayley J. Strasburger, Icahn School of Medicine at Mount Sinai, USA

Short Talk: Dopamine-Mediated Control of Microglia-Neuron Interaction and Function

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

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

Poster Session 3

FRIDAY, JUNE 7

Departure