

UAB Comprehensive Neuroscience Center

Annual Retreat 2023 Program



September 13-14, 2023
The Valley Hotel- Homewood, AL



COMPREHENSIVE NEUROSCIENCE CENTER

The University of Alabama at Birmingham

UAB Comprehensive Neuroscience Center

Mission

The overall mission of the CNC is to promote and support interdisciplinary neuroscience research, clinical care and education at UAB.

Leadership

Jeremy Day, Ph.D.

Director
Associate Professor
Department of Neurobiology
UAB Heersink School of Medicine

Karen Gamble, Ph.D.

Associate Director for Research
Professor
Department of Psychiatry
UAB Heersink School of Medicine

Lawrence Sincich, Ph.D.

Associate Director for Grants in Preparation (GRiP)
Professor
Department of Optometry & Vision Science
School of Optometry

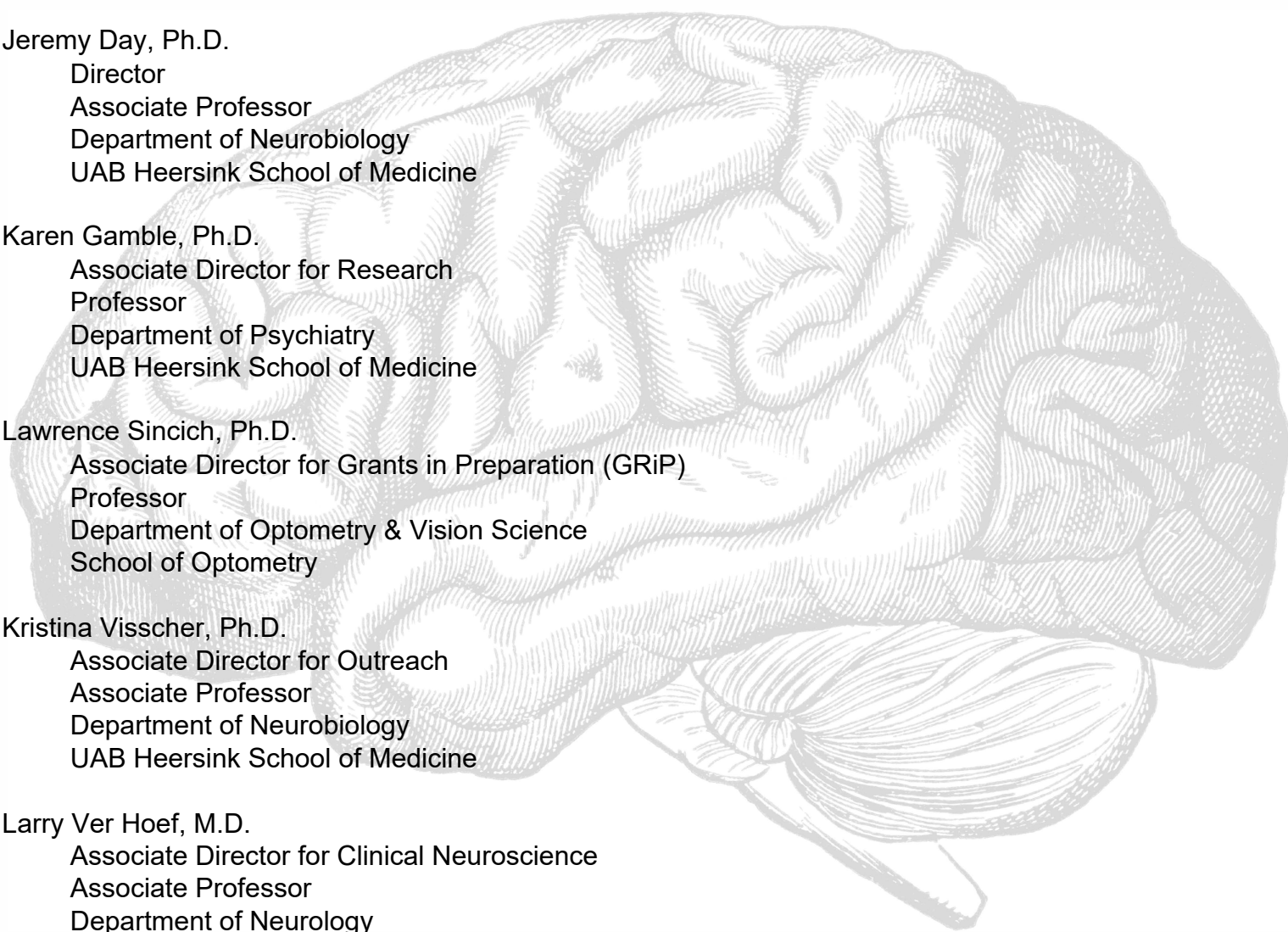
Kristina Visscher, Ph.D.

Associate Director for Outreach
Associate Professor
Department of Neurobiology
UAB Heersink School of Medicine

Larry Ver Hoef, M.D.

Associate Director for Clinical Neuroscience
Associate Professor
Department of Neurology
UAB Heersink School of Medicine

Audrey Coachman, MHA
Program Manager I



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Wednesday, September 13, 2023

9 A.M.- 10 A.M. Registration (All activities will be held in the Red Mountain Ballroom & Shades Creek room located on the second floor of the hotel.)

10:00- 10:20 A.M. Welcome & Announcements

10: 20 A.M.- 11 A.M. State of the CNC Address

Jeremy Day, Ph.D.
Director, Comprehensive Neuroscience Center
Michael J. Friedlander Heersink Endowed Professorship
Associate Professor, Department of Neurobiology
UAB Heersink School of Medicine

11 A.M.- Noon Keynote Speaker I Moderator: Dr. Lawrence Sincich

“Acetylcholine as a neuromodulator: role in affective behaviors”

Marina Picciotto, Ph.D.
Charles B.G. Murphy Professor in Psychiatry and Deputy Chair for Basic Science Research
Director of the Division of Molecular Psychiatry
Professor, Neuroscience, Pharmacology and the Child Study Center
Deputy Director of the Kavli Institute for Neuroscience
Yale University

Noon- 1 P.M. Lunch - Join a Focus Area Discussion Table!

1 P.M.- 2:30 P.M. New Faculty Session I Moderator: Dr. Larry VerHoef

“Synaptic plasticity mechanisms of chronic pain”

Lingyong Li, Ph.D.
Associate Professor
Department of Anesthesiology & Perioperative Medicine

“Stimulation-evoked networks in the epileptic brain”

Rachel June Smith, Ph.D.
Assistant Professor
Department of Electrical and Computer Engineering, NeuroEngineering

“Neuroimaging approaches to diagnosing Parkinson’s disease – Opportunities and Challenges.”

Virendra Mishra, Ph.D.
Associate Professor
Department of Radiology

2:30 P.M. – 2:40 P.M. Break



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2:40 P.M. - 4:20 P.M. Trainee Session

Moderator: Dr. Jeremy Day

"Inhalation of the trichloroethylene induces cellular senescence as a mechanism of Parkinson's neurodegeneration"

Ashley Adamson
Graduate Student
De Miranda Lab

"Reelin protein is required for normal cellular and behavioral function in the striatum"

Kasey Brida
Graduate Student
Day Lab

"Functional connectivity fingerprints of individuals with Macular Degeneration are shaped by individuals' experiences"

Pinar Demirayak
Post Doc
Visscher Lab

"Dynamic cell type-specific transcriptional profiles of striatal cells across the development of L-DOPA-induced dyskinesia"

Henrique de Oliveira Amaral
Graduate Student
Jaunarajs Lab

"The role of cortico-thalamic projections in motivated behavior"

Carine Lampert
Postdoc
Beas Lab

"Alzheimer's disease risk factor BIN1 in parvalbumin interneurons"

Natalie Davis
Graduate Student
Roberson Lab

4:20 P.M.- 4:30 P.M. Break

4:30 P.M.- 6 P.M. Poster Session (Shades Creek room) & Cash Bar (Red Mountain Ballroom)

6 P.M.- 7 P.M. Reception Dinner & Continued Focus Area Discussions



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8 A.M. Breakfast

8:30 A.M.- 10:15 A.M. New Faculty Session II Moderator: Dr. Karen Gamble

"Sex-specific nicotinic receptor regulation of dopamine release mechanisms underlying substance use disorder"

Lillian Brady, Ph.D.
Assistant Professor
Department of Psychiatry & Behavioral Neurobiology

"Dissociable encoding of motivated behavior by parallel thalamo-striatal projections"

Sofia Beas, Ph.D.
Assistant Professor
Department of Neurobiology

"Neural control of disconjugate eye movements in non-human primates"

Julie Quinet, Ph. D.
Assistant Professor
Department of Optometry and Vision Science

10:15 A.M.-10:30 A.M. Break

10:30 A.M. -Noon New Faculty Session III Moderator: Dr. Kristina Visscher

"Metabolism as an intermediary between the gut microbiome and central nervous system"

Abbi Hernandez, Ph.D.
Postdoctoral Trainee
Department of Medicine: Division of Gerontology, Geriatrics, and Palliative Care

"Civitan Autism and Neurodevelopmental Research Core: Supports for Translational Research"

Cassandra Newsom, PsyD
Associate Professor
Department of Neurobiology

"THRIVE: A Recovery-focused, Brief, Psychological Intervention for Suicide Risk"

Jennifer Lockman, Ph.D.
Assistant Professor
Department of Department of Psychiatry and Behavioral Neurobiology

Noon- 1 P.M. Lunch- Join a Focus Area Discussion Table!



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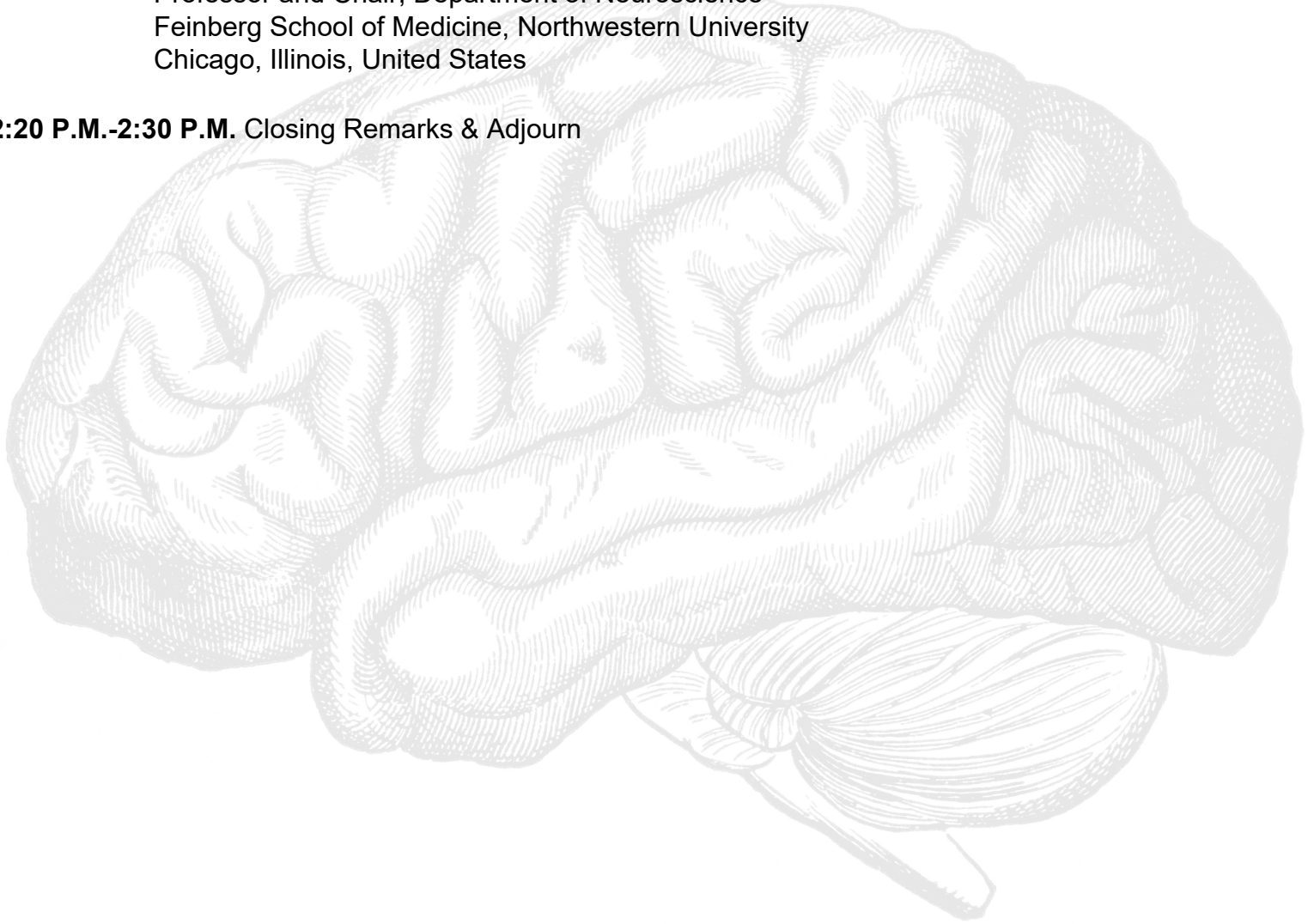
1 P.M. Announcement of Awards

1:15 P.M.- 2:15 P.M.- Keynote Speaker II Moderator: Dr. Jeremy Day

“Network determinants of progressive motor disability in Parkinson’s disease.”

D. James Surmeier, Ph.D.
Professor and Chair, Department of Neuroscience
Feinberg School of Medicine, Northwestern University
Chicago, Illinois, United States

2:20 P.M.-2:30 P.M. Closing Remarks & Adjourn



Thank you for attending the 2023 CNC Retreat!
A post event survey will be sent via email for feedback.



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Keynote Speakers

Marina Picciotto, Ph.D.

Marina Picciotto is the Charles B.G. Murphy Professor in Psychiatry, Deputy Chair for Basic Science Research and Director of the Division of Molecular Psychiatry at Yale University. She is also professor in the departments of Neuroscience, Pharmacology and the Child Study Center and Deputy Director of the Kavli Institute for Neuroscience at Yale. She received her PhD from The Rockefeller University in the laboratory of Dr. Paul Greengard and did her postdoctoral work at the Institut Pasteur with Dr. Jean-Pierre Changeux. Dr. Picciotto's research focuses on the role of acetylcholine and its receptors in cellular processes and circuits relevant to complex behaviors and psychiatric illness.

Dr. Picciotto was Editor-in-Chief of the Journal of Neuroscience from 2015-2022, and is the incoming President-Elect of the Society for Neuroscience. Dr. Picciotto is a member of the National Academy of Medicine and a Fellow of the American Association of the Advancement of Science.



D. James Surmeier, Ph.D.

D. James Surmeier is a Nathan Smith Davis Professor and Chair of the Department of Neuroscience at the Feinberg School of Medicine at Northwestern University.

Dr. Surmeier received his Ph.D., in Physiology and Biophysics from the University of Washington. He trained with leaders in the field of neurophysiology, including Dr. Arnold Towe, Dr. William Willis and Dr. Stephen Kitai. He assumed his current position as Chair of the Department of Physiology (renamed 09/01/21, to Neuroscience) at Northwestern University in 2001. Using an array of cutting-edge approaches, Dr. Surmeier's research program focuses physiological determinants of Parkinson's and Huntington's diseases. His work has uncovered basic mechanisms underlying neural activity in the basal ganglia and how it is perturbed in these disease states. His work has identified the molecular determinants of network dysfunction in both diseases, paving the way for novel pharmacological and genetic therapies. His pursuit of the mechanisms underlying selective neuronal vulnerability in Parkinson's disease has led to the identification of activity-dependent calcium entry through Cav1 Ca²⁺ channels as a primary trigger for mitochondrial oxidant stress in at-risk neurons, providing a potential explanation for the selective vulnerability of substantia nigra dopaminergic neurons—neurons whose loss underlies the cardinal motor symptoms of Parkinson's disease. Corroborated by epidemiological studies, this discovery study has led to a major Phase III clinical trial in North America to determine the ability of the dihydropyridine isradipine to slow the progression of early stage Parkinson's disease.



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Presentation Awards

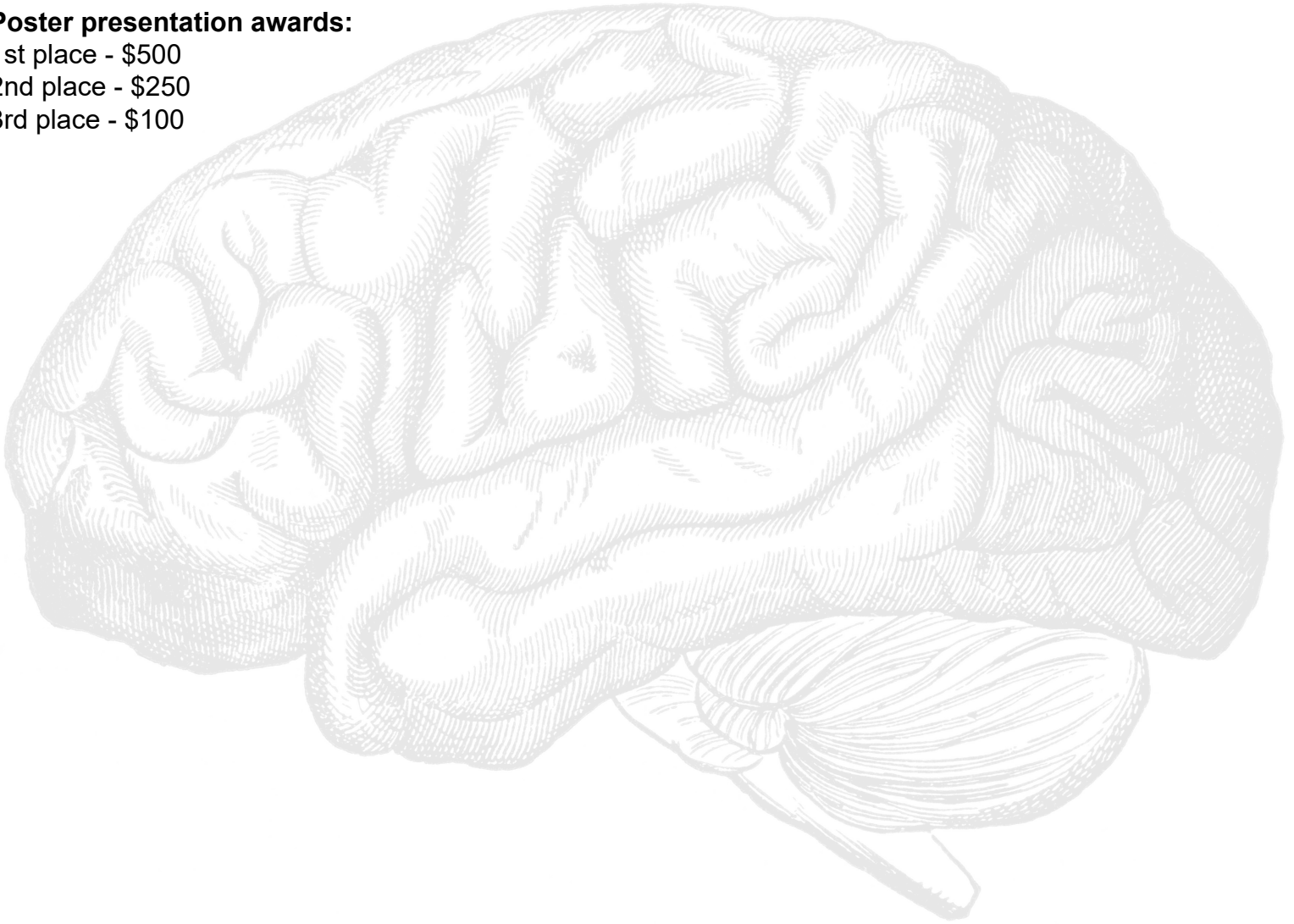
Trainee platform presentations will be selected from the submitted abstracts by a panel of judges. Awards will be given for both platform and poster presentations.

Platform (oral) presentation awards:

- 1st place - \$500
- 2nd place - \$250
- 3rd place - \$100

Poster presentation awards:

- 1st place - \$500
- 2nd place - \$250
- 3rd place - \$100



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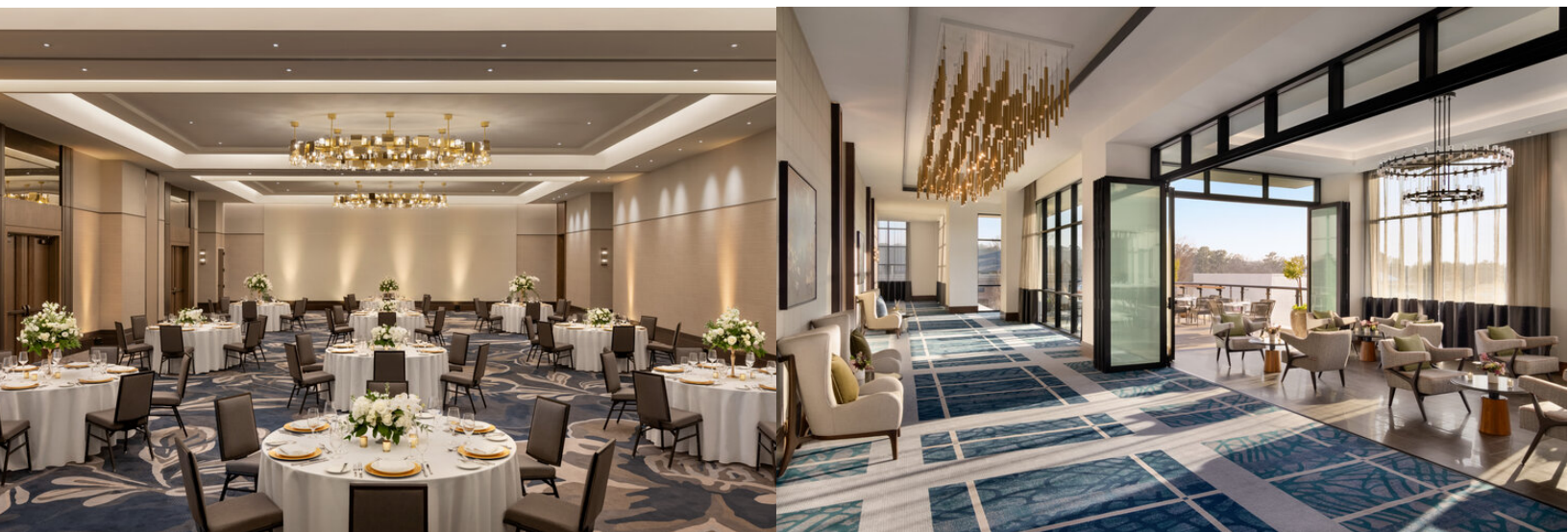
Location

Valley Hotel

2727 18th Street South

Homewood, AL 35209

Website: <https://www.valleyhotelbirmingham.com/>



Directions

Traveling South on I-65:

Take exit 261B on the left to merge onto I-20E / I-59N toward Atlanta/Gadsden.

Take exit 126A to merge onto US-280 E / US-31 S. Keep left to continue US-31 S/Montgomery Pkwy. Turn right onto 28th Avenue S. Turn right onto 18th Street S.

Traveling North on I-65:

Travel North on I-65 toward Birmingham. Take exit 252 for US-31/Montgomery Hwy. Turn right onto US-31/Montgomery Hwy. Continue straight onto Independence Drive/Montgomery Pkwy. Turn left onto 28th Avenue S. Turn right onto 18th Street S.

Parking

The Valley Hotel offers convenient on-site parking in the parking lot located on the East side of the hotel. Street parking is also available.



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Poster Session

1. *An increase in interstitial progranulin using AAV gene therapy reduces markers of neurodegeneration*
SN Fox, S. Kashyap, AE Arrant, ED Roberson
2. *Establishing a Novel Mouse Model of Cancer-Related Cognitive Impairment to Assess Neural and Circuit Mechanisms*
Briana Machen, Alan Umfress PhD., James Bibb PhD., Sofia Beas PhD.
3. *Distinct corticothalamic integration by primary and higher-order inhibitory cells of the thalamus*
Christian Puzzo, Hero Liu, William Gilbert, Levi Dyson, Ayush Jain, Rosa Martinez-Garcia, Scott Cruikshank
4. *Alzheimer's Disease Clock Gene Expression Alterations in Parvalbumin Interneurons*
Mary Bullock Cooper, Eshika Kudaravalli, Erik Roberson, Rita Cowell, Karen Gamble
5. *Neuronal activation by cocaine varies across molecularly-defined subpopulations of VTA dopamine neurons*
Dalton Fitzgerald, Emma Andracka, Robert A. Phillips III, Jennifer J. Tuscher, Jeremy J. Day
6. *Transcription factor 4 coordinates striatal neuron specification, maturation, and dopamine transmission*
Nathaniel J. Robinson, Jenna E. Hinds, Lucas M. James, Saige Thompson, Jennifer J. Tuscher, Lara Ianov, Benjamin D. Philpot, Jeremy J. Day
7. *MAPT expression is regulated by numerous long-range interactions with cis-regulatory elements*
Brianna B. Rogers, Ashlyn G. Anderson, Shelby N. Lauzon, M. Natalie Davis, Rebecca M. Hauser, Sydney C. Roberts, Ivan Rodriguez-Nunez, Katie Trausch-Lowther, Erin A. Barinaga, Paige I. Hall, Jared W. Taylor, Mark Mackiewicz, Brian S. Roberts, Sara J. Cooper, Lindsay F. Rizzard, Richard M. Myers, J. Nicholas Cochran
8. *Quantifying retinal functional health in patients with varying scotoma patterns by accounting for cortical magnification factor*
Elam J. Cutts, Marcello Maniglia, Matt K. Defenderfer, Pinar Demirayak, Dawn K. DeCarlo, Kristina M. Visscher
9. *Altered DNA Hydroxymethylation and Neuronal Activity Gene Expression in the Dorsal Hippocampus of a Temporal Lobe Epilepsy Model Following Sequential Behavioral Testing*
Rudhab Bahabry, Jonathan Harmon, Leah Dinah Sheppard, Bellafaith Oyassan, Farah D. Lubin
10. *Role of infralimbic cortex inhibitory neurons in the extinction of auditory fear memory*
Rodrigo Campos-Cardoso, Zephyr R. Desa, Brianna L. Fitzgerald, Kirstie A. Cummings
11. *Co-pathologies and immune cell activation in a model of Parkinson's Disease*
Jhodi M Webster, Gabrielle M Childers, Nicole J Gallups, Lucas Hampton, Warren D Hirst, Jeffrey H Kordower, Ashley S Harms
12. *Exploring the role of B cells in a mouse model of Multiple System Atrophy (MSA)*
Gabrielle Childers, Nicole J Gallups, Jhodi Webster, Asta Zane, Jeffrey Kordower, Ashley Harms



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Poster Session

13. *The Role of Disease-associated Microglia in a Mouse Model of Parkinson's Disease*
Y. Yang, A. M. Schonhoff, D. A. Figge, G. P. Williams, A. Jurkuvenaite, N. J. Gallups, G. M. Childers, J. M. Webster, D. G. Standaert, J. E. Goldman & A. S. Harms
14. *Impaired motor learning in Rett syndrome mice with MECP2 deletion in Purkinje cells*
Mikayla Jackson, Peter Shen, Carol Li, Wei Li
15. *Comparison of risk-modifying, Alzheimer's disease-associated APOE isoforms in lipid-bound state provides insight into structural differences*
Ryan A. Tuckey, Rory A. Greer, Hunter B. Dean, Erik D. Roberson, Yuhua Song.
16. *Immunofluorescence Analysis of Inflammation in Rat Models of Parkinson's Disease*
Sydney Taylor and Matthew Goldberg
17. *Neural circuits underlying estrous cycle regulation of state-dependent emotional memory*
Nina E. Baumgartner, Kristen H. Adcock Binion, Gaven C. Bell, Amuktha S. Dasari, Gavin C. Newberry, Timothy H. Rumbell, Jeremy M. Simon, & Elizabeth K. Lucas
18. *Analysis of brain-wide projections to the dorsal peduncular cortex*
Brianna Fitzgerald, Victoria Landar, Jace Duhon, Kirstie Cummings
19. *The role of Heme and Hemopexin in Urologic Chronic Pelvic Pain Syndrome in Mice.*
Gryshyna, A., DeWitte, C., Andrade, F., Patel, R.P., DeBerry, J.J.
20. *Understanding the Roles of Gap Junction Molecule innexin-19 in Post-Embryonic Neuronal Maturation*
Molly Reynolds, HaoSheng Sun
21. *State-Dependent Modulation of Paraventricular Thalamus Activity*
Alexa J. Tellez, Carine Lampert, Morris R. Jackson, & Sofia Beas
22. *The O-GlcNAc Transferase is associated with the Ten-Eleven Translocation Enzyme to control DNA hydroxymethylation in the epileptic hippocampus*
Anna Maria Schreiber, Rudhab Bahabry, Farah Lubin
23. *The Impact of Peripherally-targeting Interventions on Multiorgan Gene Expression in Aged Rats*
Sarah Ding, Anisha Banerjee, Abbi Hernandez
24. *Role of Community Poverty and Adverse Childhood Experiences on Conditioned Pain Modulation in a Chronic Low Back Pain sample*
Pavithra A. Thomas, Caroline Webb, Sammy Stocking, Tammie Quinn and Robert E. Sorge



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Poster Session

25. *Synapse in the healthy and diseased CNS*
Yuchen Wang, Yan Cao, Naomi Kamasawa, Katherine E. Fehlhaber, Cassandra Hays, Ignacio Sarria, Norianne T. Ingram, David Fitzpatrick, Alapakkam P. Sampath, Wei Li, Christina Zeits, William Hauswirth, Wallace Thoreson, and Kirill A. Martemyanov
26. *Acute morphine and glucocorticoid signaling regulate FKBP5 expression in astrocytes*
Angela C Cleere, Jennifer J Tuscher, Nathaniel J Robinson, Robert A Philips III, Lara Ianov, Robert Sorge, Jeremy J Day
27. *Impaired cognitive function and Alzheimer's Disease-related neuropathology in neural subregions of the transgenic Fisher344 Alzheimer's Disease rat*
Macy A. McCuiston, Kristian Davis, Nateka L. Jackson, Lori L. McMahan, Lynn E. Dobrunz, Caesar M. Hernandez
28. *Novel Strategies for the Clearance of α -Synuclein Aggregates via the Mannose 6-Phosphate Pathway*
Saumya Digraskar¹, Mckenzie Riley¹, Piyali Das¹, Laura Volpicelli-Daley¹, Julianna Follmar², Kamil Godula² and Patricia Aguilar-Calvo¹
¹ Department of Neurology, The University of Alabama at Birmingham, Birmingham AL
² Department of Chemistry and Biochemistry, University of California, San Diego, CA
29. *UAB Biological Data Sciences (U-BDS) core provides extensive computational biology services to the UAB research community*
Bharat Mishra, Austyn Trull, Nilesh Kumar, Liz Worthey, and Lara Ianov
30. *Offsprings' Meningeal and Brain Immune Cell Populations Are Impacted By Maternal Immune Activation*
Jana H. Badrani, Pheobe Garcia, Shin-ichi Kano
31. *Investigating Novel Heparan Sulfate Mediated Mechanisms of α -Synuclein Cell-to-Cell Spread*
McKenzie B. Riley, Saumya Digraskar, Piyali Das, Sai Garlanka, Laura Volpicelli-Daley, and Patricia Aguilar-Calvo
32. *Impact of the NIH policy on sex as a biological variable: Focus on sex representation in pre-clinical fear conditioning studies*
May Rudd, Arkady Bilenkin, & Elizabeth K. Lucas
33. *Hippocampal-prefrontal neuronal dynamics contributing to social memory deficits in a mouse model for Rett syndrome*
Destynie Medeiros, Lucas Pozzo-Miller
34. *LRRK2 kinase inhibition protects dopaminergic neurons from Parkinson's disease-associated environmental toxicants*
Neda M. Ilieva, Dominique E. Weddle, Erik Hoffman, J. Timothy Greenamyre, and Briana R. De Miranda
35. *Roles of thalamic reticular nucleus cell types in (1) somatosensory behavior, (2) top-down cortical signaling, and (3) behavioral state transitions: Goals and Strategies.*
Hero Liu, Christian Puzzo, William Gilbert, Scott Cruikshank



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Poster Session

36. *Long-lasting impact of adolescent stress on postpartum social cognition: Unraveling circuit mechanism and glucocorticoid signaling*

José Francis-Oliveira, Kongpyung Kim, Shin-ichi Kano, Minae Niwa

37. *Human dermal fibroblast, a promising cellular model to study molecular neurobiology of psychiatric illnesses and developing biomarker tool*

Anuj Kumar Verma, Bhaskar Roy, Kevin Prall, Yogesh Dwivedi

38. *Relationship of GABA Levels in Motor Cortex to Executive Function in Older Adults*

Ashton Weber, Gabriell Champion –Georgia State University, Thomas Novak, Ph.D. – Emory University, Joe R. Nocera- Emory University, Kevin Mammino- Atlanta VA Medical Center, Medina Bell- Atlanta VA Medical Center, Ashton M. Weber –University of Alabama at Birmingham, Lisa C. Krishnamurthy- Atlanta VA Medical Center, Keith M. McGregor- University of Alabama at Birmingham

39. *M6A Methylation in Early Life Stress-Induced Depressive Behavior*

Monima Anam and Yogesh Dwivedi

40. *Differences in the Modulation and Facilitation of Painful Stimuli Between Cisgender and Transgender Individuals*

Samantha Q. Stocking, Caroline K. Webb, Shruti R. Gunapati, Ayona Roychowdhury, Stacie K. Totsch, Tammie L. Quinn, & Robert E. Sorge



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