

Annual Scientific Retreat 2025



Wednesday, September 24 – Thursday, September 25

Holiday Inn Resort

1706 N Lumina Ave

Wrightsville Beach, NC 28480

Invited Keynote Speakers



Scott H. Soderling, PhD

Duke University School of Medicine

Chair of Cell Biology

George Barth Geller Distinguished Professor
for Research in Molecular Biology

Professor of Cell Biology

Professor of Neurobiology

Ashley Wilson, PhD

Verily

Senior Product Manager



Schedule of Events

Wednesday, September 24, 2025	
12:30 pm – 1:00 pm	Conference Check-In
1:00 pm – 1:05 pm	Introduction Steve Lisberger
	Talk Session I, Moderator: Nuo Li
1:10 pm - 1:30 pm	Rebecca Yang, PhD “From Genes to Circuits: Natural Variation in Decision Making”
1:35 pm - 1:55 pm	Emily Alway – Student, Bohorquez Lab “Trusting your gut: Adaptive responses to stimuli”
2:00 pm - 2:20 pm	Jacob Morra, PhD – Postdoc, Naumann Lab “Mapping functional connectivity with causal perturbations”
2:25 pm – 2:45 pm	Russell Ravenel – Student, Tadross Lab “Cell-type-specific pharmacology reveals astrocytic AMPAR control of striatal function”
2:45 pm – 3:00 pm	Short Break
3:00 pm – 3:20 pm	Jing Xu, PhD – Postdoc, Ji Lab “GPR37L1 regulates astrocytes signaling in neuropathic pain”
3:25 pm – 3:45 pm	Jeff Russ, PhD “The role of cortical intratelencephalic (IT) neurons in development and disease”
3:50 pm – 4:50 pm	<i>Keynote I: Introduction by Nicole Calakos</i> Scott H. Soderling PhD “Proximity Proteomics and AI to Decode Synaptic Mechanisms of Sleep & Parkinson’s”
5:00 pm – 7:00 pm	Poster Session I *Limited Light Hors D'oeuvres & Cash Bar *
7:00 pm – 8:30 pm	Dinner Banquet Cash Bar Student Skit

Thursday, September 25, 2025	
7:30 am – 9:00 am	Breakfast Available Outside Ballroom <i>This may be a good time to check out and take bags to cars. Checkout is at 11:00 am</i>
	Talk Session II, Moderator: Jenna McHenry
9:00 am – 9:20 am	Debra Silver, PhD “The choreography of brain development and evolution”
9:25 am – 9:45 am	Audrey Mercer – Postdoc, Mooney Lab “Cranking Song Circuits to Eleven: Dopamine’s Actions on the Teenage Songbird”
9:50 am – 10:10 am	Ziyi Gong – Student, Pearson Lab “Correctness is its own reward: bootstrapping error signals in self-guided reinforcement learning”
10:10 am – 10:20 am	Short Break
	Talk Session II, continued
10:20 am – 10:40 am	Yoonhee Ki – Student, Li Lab “Altered Cortico-Striatal Decision Signals in a Rett Syndrome Mouse Model”
10:45 am – 11:45 am	<i>Keynote II: Introduction by Lindsey Glickfeld</i> Ashley Wilson, PhD “Talking to Strangers: Why your Ph.D. is the perfect launchpad to a career in tech”
12:00pm – 2:00 pm	Lunch/Free time
	Talk Session III, Moderator: Arnaldo Carreira Rosario
2:00 pm – 2:20 pm	Marija Rudzite – Student, Sommer Lab “Retinotectal pathway reveals novel ganglion cell types in macaque”
2:25 pm – 2:45 pm	Zijian Zhang, PhD – Postdoc, Velmeshev Lab “Cell Type-Specific Analysis and Modulation of Neural Circuits Using Rabies Virus”
2:50 pm – 3:10 pm	Kevin Franks, PhD “Respiration coordinates olfactory cortex activity”
3:20 pm – 5:35 pm	Poster Session II *Limited Hors D'oeuvres*
5:45 pm – 6:00 pm	Awards for Best Student and Postdoc Talks Michael Mutersbaugh Award

Poster Session I: Wednesday, September 24, 2025, 5:00pm-7:00pm



Graduate Student



Postdoc



Lab Affiliate



Principal Investigator

Poster	Name/ Position		Lab	Title
1	Emily Alway		Bohorquez	<i>Using lessons from bariatric surgery to sculpt sugar preference from the gut</i>
2	Andrew Bae		Calakos	<i>Mapping Cell Type-Specific mGluR5 Interactions Associated with Motor Dysfunction in Parkinson's Disease</i>
3	Alexandra Barker		Kay	<i>Exploring molecular and cellular signals that drive astrocyte phagocytosis during retinal development</i>
4	Lydia Blatnik		Southwell	<i>Characterizing Transplanted Human Stem Cell-Derived Interneurons in Human and Mouse Organotypic Slices</i>
5	Alev Brigande		Disney	<i>Relationship between cortical interneuron classification schemes for rodents and primates</i>
6	Celine Cammarata		Glickfeld	<i>Network Role of SST Interneurons Differs with Stimulus Size and Visual Area</i>
7	Maddie Clark		Bilbo	<i>Impact of Adolescent Social Isolation on Behavior and Microglia-Dopamine System Interactions During Development</i>
8	Mara Cowen		West, Anne	<i>Functional and gene expression phenotypes in iPSC-derived neurons expressing Rahman Syndrome mutations in histone H1-4</i>
9	Robert Driver		Matsunami	<i>Evolution and functional characterization of olfactory receptors in birds</i>
10	Elise Edgar		Kay	<i>Astrocytes use the extracellular matrix protein Fibrillin-2 to pattern developing vasculature in mouse retina</i>
11	Kayla Fernando		Hull	<i>Testing the cellular and synaptic mechanisms of cerebellar motor learning</i>
12	Mia Foglesong		Franks	<i>A Novel Head-Fixed Paradigm for Dissecting Neural Mechanisms of Odor Localization</i>
12	Simon Daste		Franks	<i>A Novel Head-Fixed Paradigm for Dissecting Neural Mechanisms of Odor Localization</i>
13	Kaitlyn Fouke		Naumann	<i>Dissecting neural circuits underlying visuomotor transformations in larval zebrafish</i>
14	Veronica Galvin		Disney	<i>Mixed effects of nicotine across a cortical column in V1 are well described by a normalization model of attention</i>
15	Sara Gannon		Glickfeld	<i>Feedforward mechanisms of pattern direction selectivity in mouse V1</i>
16	Runbo Gao		Li	<i>Cerebellar control of seconds-long internally timed neural dynamics</i>
17	Maria Gonzalez Torres		Yang, H.	<i>Functional characterization of the TMEM16F A703S mutation associated with Parkinson's Disease</i>
18	Sarah Hadyniak		Kay	<i>Diversification of the closely related bipolar cell types in retinal development</i>
19	Aaron Halvorsen		West, Anne	<i>Viral and transgenic CRISPR epigenome-editing tools to modulate Arc expression</i>
20	Tom Harmon		Mooney	<i>Brain-wide mapping of neuroanatomical connections to the auditory cortex of hearing and deaf mice</i>
21	Zichen He		Naumann	<i>Behavioral and neural characterization for action selection in larval zebrafish</i>

Poster Session I: Wednesday, September 24, 2025, 5:00pm-7:00pm



Graduate Student



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Lab Affiliate



Principal Investigator

Poster	Name/ Position		Lab	Title
22	Mariana Holguin Lopez		Huang	<i>Utilizing transcription factor expression to dissect the lineage organization of cortical glutamatergic neurons</i>
23	Hannah Hortman		Calakos	<i>Living with Stress: Differences in how much dopamine neurons engage a cell stress pathway at steady-state explain their propensity to resist death in Parkinson's disease</i>
24	Tingwei Hu		Glickfeld	<i>Effect of blocking AMPA receptors on VIP-expressing interneurons depends on visual stimulus size</i>
25	Miles Jacob		Franks	<i>Semilunar cells in the mouse piriform cortex are necessary for the acquisition, but not retrieval, of odor memories</i>
26	Ashley Jia		Volkan	<i>The effect of social isolation on dopamine systems and behavior</i>
27	Katherine Kaplan		Mooney	<i>Serotonergic Modulation of Birdsong</i>
28	Phoebe Lee		Silver	<i>Radial glial cell mediated subcellular signaling in the developing cortex</i>
29	Tracy Lee		Kay	<i>Restoring Vision Through CRB1: Molecular Mechanisms and Therapeutic Rescue</i>
30	Julia Leeman		Groh	<i>How do harmonic relationships affect grouping of sounds?</i>
31	Amanda Lewis		Grandl	<i>Piezo1 inactivation kinetics are modulated by membrane proteins</i>
32	Shuoyi Li		Mooney	<i>Illuminating the neural circuits that motivate birdsong practice and performance</i>
33	Alix Macklin		Groh	<i>The Splint: a device to help insert long Neuropixels probes into the brain</i>
34	Miles Martinez		Pearson	<i>Inferring structure in acoustic variability</i>
35	Yuleika Martinez Castillo		Eroglu	<i>Elucidating the role of Mitochondrial-Derived Vesicles (MDV) in axons of primary hippocampal neurons</i>
36	Katherine Martucci		Martucci	<i>Low Frequency Power in the Spinal Cord Dorsal Horn is Increased in Individuals with Chronic Pain at Rest: A Cervical Spinal Cord fMRI Study</i>
37	Jim McNamara		McNamara	<i>Biochemical Analysis of Mutant TrkB Receptor Cause of Developmental Epileptic Encephalopathy</i>
38	Emmanuel Medrano		Yang, R.	<i>Internal sugar sensing shapes egg-laying site selection in Drosophila melanogaster</i>
39	S. Monroe		Bilbo	<i>Pulmonary neuroendocrine cells influence the response to respiratory viral infection in the insular cortex</i>
40	Yechan Moon		Bohorquez	<i>A Gut Sense for Dietary Protein</i>
41	Cameron Morris		Calakos	<i>Cortical and Striatal Plasticity Mechanisms Supporting the Formation of Action-Outcome Associations and Habit Expression</i>
42	Naama Reicher		Bohorquez	<i>A gut sense for medicine</i>

Poster Session II: Thursday, September 25, 2025, 3:20pm-5:35pm



Graduate Student



Postdoc



Lab Affiliate



Principal Investigator

Poster	Name/ Position		Lab	Title
1	Patrick Mulcahey		Huang	<i>A motor cortical circuit for online reaching control</i>
2	Arthy Narayanan		West, Anne	<i>Transcriptional plasticity of ventral tegmental area dopamine neurons induced after cessation of chronic cocaine exposure</i>
3	Maxim Nikitchenko		Naumann	<i>Ptba: Flexible tools for imaging and behavioral experiments</i>
4	Sevgi Ozturk		Hull	<i>Cerebellar Circuit Processing During Reward Learning</i>
5	Shirui Zheng		Carreira Rosario	<i>Examining the relationship between interneuron morphology and the initiation of synchronized neural activity (SNA)</i>
6	Steven Pilato		Glickfeld	<i>Developing a Mouse Virtual Reality Paradigm to Test the Cerebellar Contribution to V1 Prediction Errors</i>
7	Aja Pragana		Bilbo	<i>Impacts of prenatal stress on offspring lung-brain axis development and immune signaling</i>
8	Ran Guo		Ji	<i>β-Arrestin-biased allosteric modulator of NTSR1 attenuates acute and chronic pain</i>
9	Community Engagement Committee			<i>Informational poster</i>
10	Marta Rozados Barreiro		Volkan	<i>Social Modulation of Autophagy in the Drosophila Brain</i>
11	Drew Schreiner		Mooney	<i>A synaptic locus of song learning</i>
12	Martin Seeber		Suthana	<i>Human brain imaging during real-world navigation</i>
13	Olivia Shamberger		Bilbo	<i>Effects of Adolescent Isolation on Social Behavior</i>
14	Justine Shih		Groh	<i>Encoding of Complex Sounds Across Time in the Primary Auditory Cortex</i>
15	Michael Sindoni		Grandl	<i>Biophysical characterization of the human force-gated ion channel Piezo2</i>
16	Shaoyong Song		Ji	<i>PD-1 Blockade Reactivates Immune Responses to Relieve Chronic Pain via CD8⁺ T Cells in Female Mice</i>
17	Wendy Sun		Matsunami	<i>Chicken olfactory receptors: functional profiling and evidence of gene conversion-mediated evolution</i>
18	Owen Traubert		Naumann	<i>Titration of Single-Cell Photostimulation Responses</i>
19	Mauricio Vallejo Martelo		Suthana	<i>Closed-loop Neuromodulation of Amygdala-Hippocampus Circuitry for Treatment-Refractory PTSD: Insights from Chronic Ambulatory Monitoring in Naturalistic Settings</i>
20	Wei He		Ji	<i>Human SLE serum or IgG induces acute and persistent pain in mice by promoting neuroinflammation and peripheral neuropathy</i>
21	Emily Weingardt		Franks	<i>Region-specific readout of temporally coded information in the olfactory system</i>

Poster Session II: Thursday, September 25, 2025, 3:20pm-5:35pm



Graduate Student



Postdoc



Lab Affiliate



Principal Investigator

Poster	Name/ Position		Lab	Title
22	Charlie Wu		Grandl	<i>A New Pathway of Sensing Force: Structural Basis of Piezo Conformational Signaling</i>
23	Zihan Yan		Velmeshev	<i>Metatracker: toolkit to fast, comprehensive and automated trajectory analysis of large single-cell developmental datasets</i>
24	Aryana Yousefzadeh		Tadross	<i>A cholinergic hub in the nucleus accumbens gates opioid reward learning</i>
25	Nicolas Zerda Afanador		Kay	<i>The effects of HIF on retinal astrocyte development</i>
26	Wei Zhang		Li	<i>Context-dependent motor planning: neural dynamics and circuit mechanisms</i>
27	Jessica Zhang		Huang	<i>Molecular mechanisms underlying direct v.s. indirect neurogenesis of extratelencephalic neurons</i>
28	Quanshan Zhang		Franks	<i>Functional mapping of olfactory bulb inputs to the anterior olfactory nucleus</i>
29	Junli Zhao		Ji	<i>General Anesthesia-activated Neurons in the Central Amygdala Mediate Antinociception: Distinct Roles in Acute versus Chronic Phases of Nerve Injury</i>
30	Bingzhen Zhao		Li	<i>Probing Decision States and Change of Mind in Mice</i>
31	April Zuo		Yang, R.	<i>Genetic Basis for Variation Underlying Non-Visual Cues-Driven Spatial Learning in Drosophila</i>
32	Harini Gangadharan		Calakos	<i>Investigating the role of cell stress response pathway in Parkinson's disease</i>
33	Ned Kan		Yang, R.	<i>Two pairs of dopaminergic neurons represent substrate value during egg-laying site selection</i>
34	David St-Amand		Pearson	<i>Do we need space and time to understand color vision?</i>
35	Zac Caffall		Calakos	<i>Developing Novel Drugs to Treat DYT-TOR1A Dystonia</i>
36	Konstantin Bakhurin		Yin	<i>Direct and indirect pathways precisely modulate action parameters in licking behavior</i>
37	Medy Mu		Huang	<i>Discovering the developmental programs of cortical projection neuron specification and differentiation</i>
38	Juan Valdez-Lopez		Kay	<i>Testing the effect of putative astrocyte-derived molecular cues on vessel development through neonatal retinal electroporation</i>
39	Nirvika Rastogi		Velmeshev	<i>Identifying and targeting Epigenetic Hotspots to ameliorate the Developmental Molecular Pathology of Down Syndrome</i>
40	Carlo Vignali		Calakos	<i>Examining contributions of dorsal striatal dopamine and acetylcholine release in skilled forelimb reaching and behavioral flexibility</i>

List of Attendees

Leah Acker	Jennifer Groh	Audrey Mercer	Shaocong Su
Robert Alfredson	Ran Guo	S. Monroe	Wendy Sun
Emily Alway	Sarah Hadyniak	Yechan Moon	Nanthia Suthana
Diego Arroyo	Aaron Halvorsen	Jacob Morra	Michael Tadross
Andrew Bae	Michael Harris	Cameron Morris	Olivia Timmermans
Miraya Baid	Zichen He	Han Mu	Marco Toc Sagra
Konstantin Bakhurin	Wei He	Patrick Mulcahey	Owen Traubert
Keylin Banegas-Morales	Mariana Holguin Lopez	Arthy Narayanan	Xinyu Tu
Sangsu Bang	Hannah Hortman	Eva Naumann	Juan Valdez-Lopez
Alexandra Barker	Tingwei Hu	Thomas Nguyen	Mauricio Vallejo Martelo
Lilyanne Beaver	Limeng Huang	Maxim Nikitchenko	Dmitry Velmeshev
Lydia Blatnik	Josh Huang	Anne Ojo	Carlo Vignali
Alev Brigande	Court Hull	Chukwuebuka Oragwam	Gabriela Vilchez
Zachary Caffall	Miles Jacob	Sevgi Ozturk	Brandon Villanueva Sanchez
Nicole Calakos	Ru-Rong Ji	Pinal Patel	Pelin Volkan
Celine Cammarata	Ashley Jia	Newton PenkoffLidbeck	Catherine Wang
Arnaldo Carreira Rosario	Heet Kaku	Alba Peris-Yague	Emily Weingardt
Sharat Chandra	Suyang Kan	Steven Pilato	Anne West
Jian Chen	Katherine Kaplan	Sharon Powley	William Wetsel
Maddie Clark	Jeremy Kay	Aja Pragana	Autumn Wetsel
Mara Cowen	Yoonhee Ki	Nirvika Rastogi	Charlie Wu
Simon Daste	Kobi Kobi	J. Russell Ravenel	Yuhan Xie
Samantha Deasy	Ellisa Lang	Naama Reicher	Hermione Xu
Anita Disney	Tracy Lee	Joseph Rittiner	Jing Xu
Michelle Dodson	Phoebe Lee	Marta Rozados Barreiro	Zihan Yan
Camille Donoho	Lumi Lee	Marija Rudzite	Haidun Yan
Robert Driver	Julia Leeman	Brayan Ruiz Lopez	Rebecca Yang
Elise Edgar	Agustin Letelier	Jeffrey Russ	Xiaolu Yang
Alana Evora	Amanda Lewis	Jillian Saunders	Bonnie Yao
Kayla Fernando	Nuo Li	Drew Schreiner	Aryana Yousefzadeh
Mia Foglesong	Shuoyi Li	Martin Seeber	Qihang Yuan
Kaitlyn Fouke	Angela Liang	Olivia Shamberger	Nicolas Zerda
Kevin Franks	Jing Lin	Brenda Shields	Quanshan Zhang
Alexander Friedman	Stephen Lisberger	Justine Shih	Wei Nora Zhang
Veronica Galvin	Miles Martinez	Ruichen Shu	Jessica Zhang
Harini Gangadharan	Yuleika Martinez Castillo	Debby Silver	Zijian Zhang
Sara Gannon	Katherine Martucci	Michael Sindoni	Qin Zhang
Runbo Gao	Elizabeth Matthews	Scott Soderling	Bingzhen Zhao
Lindsey Glickfeld	Jenna McHenry	Shaoyong Song	Junli Zhao
Ziyi Gong	James McNamara	Derek Southwell	Shirui Zheng
Maria Gonzalez Torres	Emmanuel Medrano	David St-Amand	April Zuo
Jorg Grandl	Muneshwar Mehra	Meredith Stewart	