Matthew K. Kirchner

Department of Medical Physiology, Texas A&M University College of Medicine
8447 John Sharp Pkwy Office 2344, Bryan, TX 77807 USA
+1 979-436-9266
mkirchner@tamu.edu
updated February 9, 2026

Education

2013-2018 PhD University of Tennessee Health Science Center
Neuroscience
Faculty Advisors: William Armstrong, PhD; Robert Foehring, PhD

2009-2013 BA College of Wooster
Neuroscience; Philosophy (Double Major)
Faculty Advisors: Amy Jo Stavnezer, PhD; Jamsheed Siyar, PhD

Professional Appointments

2025-Present Assistant Professor
Texas A&M University College of Medicine
Department of Medical Physiology

2018-2025 Postdoctoral Research Fellow
Georgia State University
Center for Neuroinflammation and Cardiometabolic Diseases, Neuroscience Institute
Faculty Advisor: Javier Stern, MD, PhD

Research Funding

Ongoing
Title: Calcium-dependent autoregulation of vasopressin neurons in a rodent model of heart failure
Funding Source: NIH (NHLBI) K99/R00 Pathway to Independence Award; K99/R00 HL168434
Grant Period: July 2023-June 2025 (K99), July 2025-June 2028 (R00)

Completed
Title: Activity-dependent organelle calcium dynamics and their impact on firing activity in vasopressin neurons during heart failure
Funding Source: NIH (NHLBI) F32 Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship; F32 HL158172
Grant Period: June 2021-July 2023 (**terminated 12 months early due to K99/R00 acceptance*)

Peer-Reviewed Publications *(*denotes shared first authorship)*

Shook L., **Kirchner M.K.**, Campos-Lira E., Stern J.E. 2026. The intermediate conductance calcium-dependent K^+ channel does not contribute to the slow afterhyperpolarization (sAHP) in oxytocin and vasopressin hypothalamic magnocellular neurons. *J. Neuroendocrinology*

Elsaafien K.*, **Kirchner M.K.***, Baumer-Harrison C., Tan Y., Johnson D.N., Scott K.A., Zhou J., Zhang Y., Lang Y., Bulitta J., Stern J.E., de Kloet A.D., Krause E.G. 2026. Cross-talk amongst oxytocin and vasopressin neurons of the paraventricular nucleus of the hypothalamus increases blood pressure in mice. *Circulation Research*

Aspesi D.*, Walton J.S.*, Grieb Z.A.*, **Kirchner M.K.**, Song Z., Long M.R., Larkin T.E., Stern J.E., Albers, H.E. 2025. Non-synaptically released oxytocin regulates social communication by acting on vasopressin V1a receptors. *J. Neuroendocrinology*

Elsaafien K., **Kirchner M.K.**, Scott K.A., Spector E.A., Mowry F.E., Sumners C., Stern J.E., de Kloet A.D., Krause E.G. 2025. Neurons of the central nucleus of the amygdala that express angiotensin type 2 receptors couple lowered blood pressure with anxiolysis in male mice. *J. Neuroscience*

Scott K.A., Tan Y., Johnson D.N., Elsaafien K., Baumer-Harrison C., Méndez-Hernández R., **Kirchner M.K.**, Eikenberry S.A., Sa J.M., Stern J.E., de Lartigue G., de Kloet A.D., Krause E.G. 2025. Mechanosensation of the heart and gut elicits hypometabolism and vigilance in mice. *Nature Metabolism*

Althammer F., Roy R., **Kirchner M.K.**, Podpecan Y., Helen J., McGrath S., Campos-Lira E., Stern J.E. 2024. Angiotensin-II drives changes in microglia-vascular interactions in rats with heart failure. *Communications Biology*

Althammer F.*, Roy R.*, **Kirchner M.K.**, Campos-Lira E., Schimmer S., Charlet A., Grinevich V., Stern, J.E. 2024. Impaired oxytocin signaling in the central amygdala in rats with chronic heart failure. *J. Physiology*

Kirchner M.K., Althammer F., Campos-Lira E., Montanez J., Stern J.E. 2024. Endoplasmic reticulum and mitochondrial calcium handling dynamically shape slow afterhyperpolarizations in vasopressin magnocellular neurons. *J. Neuroscience*

Rigney N., Campos-Lira E., **Kirchner M.K.**, Wei W., Belkasim S., Beaumont R., Sing S., Suarez S.G., Hartswick D., Stern J.E., de Vries G.J., Petrulis A. 2024. A vasopressin circuit that modulates mouse social investigation and anxiety-like behavior in a sex-specific manner. *PNAS*

Kirchner M.K., Althammer F., Donaldson K. J., Cox D. N., Stern J.E. 2023. Changes in neuropeptide large dense core vesicle trafficking dynamics contribute to adaptive responses to a systemic homeostatic challenge. *iScience*

Iskusnykh I., Fattakhov N., Li L., Bihannic L., **Kirchner M.K.**, Steshina E.Y., Northcott P.A., Chizhikov V. 2023. Lmx1a is a master regulator of the cortical hem. *eLife*

Iwasaki M., Lefevre A., Althammer F., Creusot E.C., Łąpieś O., Petitjean H., Hilfiger L., Kerspern D., Melchior M., Küppers S., Krabichler Q., Patwell R., Kania A., Gruber T., **Kirchner M.K.**, Wimmer M., Fröhlich H., Dötsch L., Schimmer J., Herpertz S.C., Ditzen B., Schaaf C.P., Schönig K., Bartsch D., Gugula A., Trenk A., Blasiak A., Stern J.E., Darbon P., Grinevich V., Charlet A. 2023. An analgesic pathway from parvocellular oxytocin neurons to the periaqueductal gray in rats. *Nature Communications*

Althammer F.*, Roy R.K.*, **Kirchner M.K.**, Campos-Lira E., Whitley K.E., Davis S., Montanez J., Ferreira-Neto H.C., Danh J., Feresin R., Biancardi V., Zafar U., Parent M.B., and Stern J.E. 2023. Angiotensin II-mediated neuroinflammation in the hippocampus contributes to neuronal deficits and cognitive impairment in heart failure rats. *Hypertension*

Althammer F., Wimmer M., Krabichler Q., Küppers S., Schimmer J., Fröhlich H., Dötsch L., Gruber T., Wunsch S., Schubert T., **Kirchner M.K**., Stern J.E., Charlet A., Grinevich V., Schaaf C.P. 2022. Analysis of the hypothalamic oxytocin system and oxytocin receptor-expressing astrocytes in a mouse model of Prader-Willi syndrome. *J. Neuroendocrinology*

Chao D.H.M.*, **Kirchner M.K.***, Pham C., Foppen E., Denis R., Castel J., Morel C., Montalban E., Hassouna R., Bui L., Renault J., Mouffle C., Caceres C.G., Tschöp M.H., Li D., Martin C., Stern J.E., Luquet S.H. 2022. Hypothalamic astrocytes control systemic glucose metabolism and energy balance: implication of extra-synaptic glutamate signaling. *Cell Metabolism*

Perkinson M.R., **Kirchner M.K.**, Zhang M., Augustine R.A., Stern J.E., Brown C.H. 2022. α-Melanocyte-stimulating hormone inhibition of oxytocin neurons switches to excitation in late pregnancy and lactation. *Physiological Reports*

Elsaafien K.*, **Kirchner M.K.***, Mohammed M., Eikenberry S.A., West C., Scott K.A., de Kloet A.D., Stern J., Krause E.G. 2021. Identification of novel cross-talk between the neuroendocrine and autonomic stress axes controlling blood pressure. *J. Neuroscience*

Wahis J., Baudon A., Althammer F., Kerspern D., Goyon S., Hagiwara D., Lefevre A., Barteczko L., Boury-Jamot B., Bellanger B., Abatis M., Gouveia M., Benusiglio D., Eliava M., Rozov A., Weinsanto I., Knobloch-Bollmann H.S., **Kirchner M.K.**, Roy R.K., Wang H., Pertin M., Inquimbert P., Pitzer C., Siemens J., Goumon Y., Boutrel B., Lamy C.M., Decosterd I., Chatton J.Y., Rouach N., Young W.S., Stern J.E., Poisbeau P., Stoop R., Darbon P., Grinevich V., Charlet A. 2021 Astrocytes mediate the effect of oxytocin in the central amygdala on neuronal activity and affective states in rodents. *Nature Neuroscience*

Tang Y., Benusiglio D., Lefèvre A., Hilfiger L., Althammer F., Bludau A., Hagiwara D., Baudon A., Darbon P., Schimmer J., **Kirchner M.K.**, Roy R.K.., Wang S., Eliava M., Wagner S., Oberhuber M., Conzelmann K., Schwarz M., Stern J., Leng G., Neumann I., Charlet A. 2020. Social touch promotes inter-female communication via activation of oxytocin parvocellular neurons. *Nature Neuroscience*

Kirchner M.K., Armstrong W.E., Guan D., Ueta Y., Foehring R.C. 2019. PIP_2 alters Ca^{2+} currents in acutely dissociated supraoptic oxytocin neurons. *Physiological Reports*

Armstrong W.E., Foehring R.C., **Kirchner M.K.**, Sladek C.D. 2018. Electrophysiological properties of identified oxytocin and

vasopressin Neurons. *J. Neuroendocrinology*

Kirchner M.K., Foehring R.C., Callaway J., Armstrong W.E. 2018. Specificity in the interaction of high-voltage-activated Ca^{2+} channel types with Ca^{2+}-dependent afterhyperpolarizations in magnocellular supraoptic neurons. *J. Neurophysiology*

Kirchner M.K., Foehring R.C., Wang L., Chandaka G.K., Callaway J.C., and Armstrong W.E. 2017. Ptdins(4,5)P_2 (PIP_2) modulates afterhyperpolarizations in oxytocin neurons of the supraoptic nucleus. *J. Physiology*

Kirchner M.K., Stavnezer A.J. 2014. Activation of CB1 receptors may provide an effective treatment for Obsessive Compulsive Disorder. *IMPULSE Journal*

Works in Progress *(copies available upon request)*

Kirchner M.K., Ahmed I., Stern J.E. 2026. Somatodendritic vasopressin release throttles magnocellular activity by enhancing slow afterhyperpolarizations. (*pending review*)

Study Section

2025 American Heart Association, Predoctoral and Postdoctoral Awards – Basic Science 2
November 7, Role: *Ad Hoc* Member

Invitational Professional Talks

2025 *Somatodendritic Vasopressin release enhances the slow afterhyperpolarization in magnocellular neurons.*
Texas A&M NExT Department Seminar Series, Bryan, TX, USA

2024 *Vasopressin neuron intrinsic excitability, Ca^{2+} compartmentalization, and autocrine regulation.*
Georgia State University Calcium Joint Group Seminar, Atlanta, GA, USA

2024 *Changes in neuropeptide large dense core vesicle trafficking dynamics contribute towards adaptive responses to a systemic homeostatic challenge.*
World Congress on Neurohypophysial Hormones (WCNH), Atlanta, GA, USA

2024 *Vasopressin neuron vesicle trafficking and intrinsic excitability.*
Emory University Department of Medicine Seminar Series, Atlanta, GA, USA

2022 *Calcium dynamics and their role in autoregulation and intrinsic excitability of vasopressin neurons.*
Georgia State University Calcium Joint Group Seminar, Atlanta, GA, USA

2021 *Organelle Ca^{2+} dynamics shape slow afterhyperpolarizations and spike adaptation in vasopressin neurons.*
Georgia State University Neuroscience Summer Seminar Series, Atlanta, GA, USA

2017 *PIP_2 differentially modulates afterhyperpolarizations of oxytocin and vasopressin neurons of the Supraoptic Nucleus.*
World Congress on Neurohypophysial Hormones, Rio de Janiero, Brazil.

2016 *Beyond Behavior: The neurophysiology of oxytocin (and vasopressin).*
Neuroscience Seminar Series, College of Wooster, Wooster, OH, USA

Conference Poster Presentations

2025 American Physiological Summit (APS); Baltimore, MD, USA
2024 Society for Neuroscience (SfN); Chicago, IL, USA
2024 World Congress on Neurohypophysial Hormones (WCNH); Atlanta, GA, USA
2024 American Physiological Summit (APS); Long Beach, CA, USA
2023 American Physiological Summit (APS); Long Beach, CA, USA ***Abstract of Distinction**
2022 International Congress on Neuroendocrinology (ICN); Glasgow, Scotland, UK
2022 Experimental Biology; Philadelphia, PA, USA
2020 Experimental Biology; San Diego, CA, USA (*cancelled due to COVID-19*)

2018	Society for Neuroscience (SfN); San Diego, CA, USA
2017	Society for Neuroscience (SfN); Washington DC, USA
2017	World Congress on Neurohypophysial Hormones (WCNH); Rio de Janiero, Brazil
2015	Society for Neuroscience (SfN); Chicago, IL, USA
2011, 2012	Midwest Great Lakes Undergraduate Research Symposium (mGluRs) Neuroscience Undergraduate Symposium, Wooster OH & Columbus OH, USA

Awards and Honors

2024 Best Poster Presentation Runner-Up Award ($250) at World Congress on Neurohypophysial Hormones conference.

2020 Central Nervous System Section 2020 Research Recognition Award ($930) Travel Award recognizing young scientists in physiology from the American Physiological Society.

2017 Glenn P. Hatton Memorial Award ($1000) Merit-based travel award to attend the World Congress on Neurohypophysial Hormones conference in Rio de Janiero, Brazil.

2009-2013 Dean's List Scholarship ($46,000 over 4 years) Merit-based scholarship provided to academically successful students.

Research Training

2018-2025 Postdoctoral Research Fellow, Stern Laboratory
(Javier Stern, MD, PhD) Center for Neuroinflammation and Cardiometabolic Disease, Neuroscience Institute, Georgia State University, Atlanta, GA, USA

2013-2018 Graduate Research Assistant, Armstrong & Foehring Laboratories
(William Armstrong, PhD; Robert Foehring, PhD) Neuroscience Institute, University of Tennessee Health Science Center, Memphis, TN, USA

2011 Research Assistant, Jones Laboratory
(Carrie Jones, PhD) Neuroscience Center for Drug Discovery, Vanderbilt University, Nashville, TN, USA

2010 Research Intern, Ely Research Group
(Wes Ely, MD, MPH) Vanderbilt University, Nashville, TN, USA

Mentoring & Teaching

Mentoring

PhD Students

Shaina McGrath, *The role of vessel-associated microglia in heart failure*. August 2022-June 2025

Levi Shook, *Investigating the interplay between hypoxia and somatodendritic vasopressin release following inverse neurovascular coupling in supraoptic nucleus vasopressin cells.* August 2021-June 2025

Undergraduate Honors Thesis Projects

Juliana Montanez, *Morphological assessment of endoplasmic reticulum and mitochondria in vasopressin neurons during heart failure in rats.* February 2019-August 2022

Teaching

2023	NEUR8790 Concepts in Neurobiology TA, Neuroscience Institute, Georgia State University
2018-2020	*ad hoc* Tutor/Mentor for Undergraduate Neuroscience, Neuroscience Institute, Georgia State University
2015-2017	Neuroanatomy Lab TA, Medical School, University of Tennessee Health Science Center

Professional Service & Community Outreach

2021-2024 Co-chair of the Postdoctoral Association
Georgia State University, Atlanta, GA

2015-2016 Graduate Student Council Neuroscience Representative

University of Tennessee Health Science Center, Memphis, TN

2015-2017 National Brain Awareness Day organizer for Memphis high school students
University of Tennessee Health Science Center, Memphis, TN

Journal Review

editorial board member:

2025-Present Journal of Integrative Neuroscience

2023-Present Frontiers in Cellular Neuroscience

ad hoc reviewer: J. Neuroendocrinology, Physiology & Behavior, PLoS ONE, Communications Biology