

Chen Liu

Curriculum Vitae (9/2024)

Center for Hypothalamic Research
Department of Internal Medicine
Department of Neuroscience
Peter O'Donnell Jr. Brain Institute

5323 Harry Hines Blvd.
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Dallas, TX 75390-9077
Chen.Liu@UTSouthwestern.edu
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Appointments

Associate Professor (with tenure)

Depts. of Internal Medicine and Neuroscience
Investigator, Peter O'Donnell Jr. Brain Institute
Neuroscience Graduate Program
Molecular Metabolism & Metabolic Diseases Track
University of Texas Southwestern Medical Center, 2015.9-present

Education

Case Western Reserve University, Cleveland, OH, 2004-2010.

Ph.D., Dept. of Neurosciences, School of Medicine.

Pet-1 Is Required Across Different Stages of Life to Regulate Serotonergic Function.

Mentor: Evan S. Deneris, Ph.D.

Mentoring Statement

I have been mentoring high school, undergraduate/graduate students, and postdoctoral fellows over the last 15 years. Each year, our lab welcomes new summer students from the UTSW STARS and SURF research programs. Currently, we are accepting rotation students who are interested in basic and translational research in neuroscience, metabolism, and developmental biology.

I benefited tremendously from two supportive and "hands-off" mentors. I rely on the same philosophy to train my students and postdocs, providing them with resources to explore and discover while offering assistance whenever necessary. That said, I would like to share my thoughts/expectations for prospective students/postdocs who are interested in joining our group.

First, the foremost skill I expect a graduate student to acquire during Ph.D. training is the ability of critical thinking. In my opinion, it outweighs other lab skills and will have an enduring impact on life beyond graduate studies. Second, I encourage my students to take on the challenge to learn new techniques and make original discoveries. Scientific research is by no means easy and often requires hard work, perseverance, and sometimes luck. Consider it as a practice for bigger challenges later in life. Only this time, you have the support of the whole lab. Finally, students need to graduate on time (within 5 years)! Graduate training is only the first step for a long career. Don't get trapped there for too long.

For postdoctoral trainees, I expect you already have the knowledge and skills to design and carry out individual experiments. It is time to polish other skill sets to become an independent researcher. I ask my trainees to write their own grants starting from the beginning. Moreover, I encourage them to seek every opportunity to present their research (WIPS, seminars, and journal clubs). What's more, trainees in my lab travel to attend national/international meetings each year to build their professional networks. In my view, postdoc training is a journey to find a unique niche for future independent research. I will work with you to collect the necessary credentials (papers) and resources (funding) to achieve this goal.

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Selected publications (Corresponding † and first author* ONLY)

Xu, B, Lawler K, Wyler S, Li L, Swati, Keogh J, Chen X, Wan R, Almeida A, Kirsch S, Mountjoy K, Elmquist J, Farooqi S†, **Liu C†**. Orthopedia regulates Melanocortin 4 Receptor transcription and energy homeostasis (2024). **Sci Transl Med. In press**

Li L†, Xu, B, **Liu C†**. Sample enrichment for single-nucleus sequencing using concanavalin A-conjugated magnetic beads (2023). **STAR Protocols**

Li L, Wyler SC, Leon-Mercado LA, Xu B, Oh Y, Swati, Chen X, R Wan, Arnold AG, Jia L, Wang G, Nautiyal K, Hen R, Sohn JW†, **Liu C†**. Delineating a serotonin receptor pathway for appetite suppression (2022). **J. Exp Med.**

Yoo ES, Li L, Jia L, Lord CC, Lee CE, Vianna CR, Berglund ED, Cunningham KA, Xu Y, Sohn JW†, **Liu C†**. Gai/o-coupled Htr2c in the Paraventricular Nucleus of the Hypothalamus Antagonizes the Anorectic Effect of Serotonin Agents (2021). **Cell Rep.**

Li L, Yoo ES, Li X, Wyler SC, Chen X, R Wan, Arnold AG, Birnbaum SG, Jia L, Sohn JW† **Liu C†**. The atypical antipsychotic risperidone targets hypothalamic melanocortin 4 receptors to cause weight gain. (2021). **J. Exp Med.**

Chen X, Wyler SC, Li L, Arnold AG, Wan R, Jia L, Landy MA, Lai HC, Xu P, **Liu C†**. Comparative transcriptomic analyses of developing melanocortin neurons reveal new regulators for the anorexigenic neuron identity (2020). **J. Neurosci.**

Park S, Williams KW, **Liu C†**, Sohn JW†. A neural basis for tonic suppression of sodium appetite (2020). **Nat. Neurosci.**

Lord, CC, Wyler SC, Wan, R, Castorena, CM, Ahmed, N, Mathew, D, Lee, S, **Liu, C†**, Elmquist JK† (2017). The atypical antipsychotic olanzapine targets Htr2c to cause weight gain. **J. Clin. Invest.**

Wyler, SC, Lord, CC, Lee, S, Elmquist, JK, **Liu, C†** (2017). Serotonergic control of metabolic homeostasis. **Front. Cell. Neurosci.**

Liu, C.*, Bookout, A.L.*, Lee, S., Sun, K., Jia, L., Lee, C., Udit, S., Deng, Y., Scherer, P.E., Mangelsdorf, D.J., et al. (2014). PPARgamma in vagal neurons regulates high-fat diet induced thermogenesis. **Cell Metab.**

Liu, C., Lee, S., and Elmquist, J.K. (2014). Circuits controlling energy balance and mood: inherently intertwined or just complicated intersections? **Cell Metab.**

Wang, Q.*, **Liu, C.***, Uchida, A., Chuang, J.-C., Walker, A., Liu, T., Osborne-Lawrence, S., Mason, B.L., Mosher, C., Berglund, E.D., et al. (2014). Arcuate AgRP neurons mediate orexigenic and glucoregulatory actions of ghrelin. **Mol. Metab.**

Berglund, E.D.*, **Liu, C.***, Sohn, J.-W., Liu, T., Kim, M.H., Lee, C.E., Vianna, C.R., Williams, K.W., Xu, Y., and Elmquist, J.K. (2013). Serotonin 2C receptors in pro-opiomelanocortin neurons regulate energy and glucose homeostasis. **J. Clin. Invest.**

Liu, C. and Elmquist, J.K. (2012). Tipping the scales early: probing the long-term effects of obesity. **J. Clin. Invest.**

Liu, C., and Deneris, E.S. (2011). Transcriptional control of serotonin-modulated behavior and physiology. **Neuropsychopharmacology.**

Liu, C., Maejima, T., Wyler, S.C., Casadesus, G., Herlitze, S., and Deneris, E.S. (2010). Pet-1 is required across different stages of life to regulate serotonergic function. **Nat. Neurosci.**

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Other Publications

Zhao S, Lin Q, Xiong W, Li L, Straub L, Zhang D, Zapata R, Zhu Q, Sun X, Zhang Z, Funcke J, Li C, Chen S, Zhu Y, Jiang N, Li G, Xu Z, Wyler SC, Wang, M, Bai J, Han X, Kusminski CM, Zhang N, An Z, Elmquist JK, Osborn O, **Liu C**, Scherer PE (2023). Hyperleptinemia contributes to antipsychotic drug-associated obesity and metabolic disorders. **Sci Transl Med.**

Zapata RC, Zhang D, Libster A, Porcu A, Montilla-Perez P, Nur A, Xu B, Zhang Z, Correa SM, **Liu C**, Telese F, Osborn O (2023). Nuclear receptor 5A2 regulation of Agrp underlies olanzapine-induced hyperphagia. **Mol Psychiatry.**

Shankar K, Metzger NP, Singh O, Mani BK, Osborne-Lawrence S, Varshney S, Gupta D, Ogden SB, Takemi S, Richard CP, Nandy K, **Liu, C**, Zigman JM (2021). LEAP2 deletion in mice enhances ghrelin's actions as an orexigen and growth hormone secretagogue. **Mol Metab.**

Landy MA, Goyal M, Casey KM, **Liu C**, Lai HC (2021). Loss of Prdm12 during development, but not in mature nociceptors, causes defects in pain sensation. **Cell Rep.**

Shankar K, Gupta D, Mani BK, Findley BG, Lord CC, Osborne-Lawrence S, Metzger NP, Pietra C, **Liu C**, Berglund ED, Zigman JM (2019). Acyl-ghrelin is Permissive for the Normal Counterregulatory Response to Insulin-induced Hypoglycemia. **Diabetes.**

Jia L, Chang X, Qian S, **Liu, C**, Lord CC, Ahmed N, Lee CE, Lee S, Gautron L, Mitchell MC, Horton JD, Scherer PE, Elmquist JK (2018). Hepatocyte toll-like receptor 4 deficiency protects against alcohol-induced fatty liver disease. **Mol Metab.**

Caron A, Dungan Lemko HM, Castorena CM, Fujikawa T, Lee S, Lord CC, Ahmed N, Lee CE, Holland WL, **Liu C**, Elmquist JK (2018). POMC neurons expressing leptin receptors coordinate metabolic responses to fasting via suppression of leptin levels. **Elife.**

Santoro A, Campolo, M, **Liu, C**, Sesaki, H, Meli, R, Liu, Z, Kim JD, Diano, S (2017). DRP1 suppresses leptin and glucose sensing of POMC neurons. **Cell Metab.**

He Y, Shu G, Yang Y, Xu P, Xia Y, Wang C, Saito K, Hinton A Jr, Yan X, **Liu C**, Wu Q, Tong Q, Xu, Y (2016). A Small Potassium Current in AgRP/NPY Neurons Regulates Feeding Behavior and Energy Metabolism. **Cell Rep.**

Jia, L., Vianna, C.R., Fukuda, M., Berglund, E.D., **Liu, C.**, Tao, C., Sun, K., Liu, T., Harper, M.J., Lee, C.E., et al. (2014). Hepatocyte Toll-like receptor 4 regulates obesity-induced inflammation and insulin resistance. **Nat. Commun.**

Chen, Z., Holland, W., Shelton, J.M., Ali, A., Zhan, X., Won, S., Tomisato, W., **Liu, C.**, Li, X., Moresco, E.M.Y., et al. (2014). Mutation of mouse Samd4 causes leanness, myopathy, uncoupled mitochondrial respiration, and dysregulated mTORC1 signaling. **Proc. Natl. Acad. Sci. U. S. A.**

Oh, E., Maejima, T., **Liu, C.**, Deneris, E., and Herlitz, S. (2010). Substitution of 5-HT1A receptor signaling by a light-activated G protein-coupled receptor. **J. Biol. Chem.**

Research Support

Ongoing:

NIH R01 DK114036 (PI, Liu)

7/2017-2/2028

Hypothalamic MC4Rs and Antipsychotic Drug-induced Metabolic Syndrome

NIH R01 DK130892 (PI, Liu) 1/2022-12/2025

A Human Genetic Variant Ties Defective Hypothalamic Development to Obesity and Diabetes

NIH R01 DK136592 (PI, Liu) 4/2024-3/2029

Deconstruct Raphe Serotonin Neurons that Regulate Satiety

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American Heart Association 23POST1019715 1/2023-12/2024

Mentor for AHA Postdoctoral Fellowship Awardee

American Heart Association 24CDA1257999 9/2024-9/2027

Mentor for AHA Career Development Awardee

UTSW Medical Foundation Research Start-up (PI, Liu) 9/1/2015-present

Completed:

- 2020 Scientist Development Award (AHA 16SDG2726001)
- 2019 Pilot & Feasibility Award (NIH U01NS090405)
- 2018 Pilot & Feasibility Award (UTSW)
- 2018 Grossman Endowment Award for Diabetes Research
- 2016 Beginning Grant-in-Aid Award (AHA 16BGIA27260023)
- 2014 Fellowship, Davis Foundation in Eating Disorder Research.
- 2014 Fellowship, American Diabetes Association.
- 2011 Ruth L. Kirschstein National Research Service Award (T32).

Awards and Honors

6/2022 Young Investigator Award, Chinese American Diabetes Association

6/2018 Grossman Award for Excellence in Diabetes Research

1/2014 Scholarship, Keystone Symposium 2014, Vancouver, Canada.

1/2014 Scholarship, Molecular Neuroanatomy Course, Allen Brain Institute.

10/2011 Fellowship, Davis Foundation in Eating Disorder Research

1/2011 Ruth L. Kirschstein National Research Service Award (NRSA)

4/2011 Doctoral Excellence Award, Case Western Reserve University

5/2010 Vance Lemmon Award, Case Western Reserve University

5/2008 The President's Award, Case Western Reserve University

5/2008 Excellence in Science Program, American Association for the Advancement of Science (AAAS)

Invited Talks

02-05-2024 Keystone Symposium: Vancouver, BC, Canada

04-26-2023 International Society for Serotonin Research, Cancun, Mexico

12-01-2022 Chinese American Diabetes Association (virtual)

11-02-2022 Dept. of Neuroscience, Case Western Reserve University, Cleveland

02-01-2021 Keystone Symposium: Obesity: From Cell to Patient, 2021 (virtual)

12-09-2020 Korean Basic Dental Science Society 19th Annual Meeting (virtual)

09-23-2019 International Brain Research Organization Conference, Daegu, Korea

06-26-2017 Teratology Society 57th Annual Meeting, Denver, CO.

11-01-2016 Peter A. Getting Lecture, University of Iowa, Iowa City, IA.

09-08-2016 New Faculty Research Forum, UT Southwestern Medical Center.

06-25-2016 Partners Against Mortality in Epilepsy (PAME), Washington, DC.

12-04-2015 American Society for Epilepsy Annual Meeting, Philadelphia, PA.

11-20-2015 Department of Neurology, Baylor College of Medicine, Houston, TX.

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Services

2023- *UTSW Graduate School Admissions Committee*

2021- *Standing member for AHA Fellowship Signaling & Review Committee*

06-2023 *Ad hoc Reviewer for NIH DDK-B Study Section*

05-2023 *Ad hoc Reviewer for French National Research Agency*

01-2023 *Ad hoc Reviewer for NIH Special Emphasis Panel*

10-2022 *Ad hoc Reviewer for NIH POMD Study Section*

05-2022 *Ad hoc Reviewer for NIH DDK-B Study Section*

2016-2021 *Early-career reviewer for eLife*

Ad hoc Reviewer for EMBO Reports, EMBO Molecular Medicine, eLife, Endocrine Reviews, J. of Comparative Neurology, Molecular Metabolism, Molecular Psychiatry, Nature Communications, Plos Biology, Trends in Neurosciences, etc.

Memberships

2008 - Society for Neuroscience (SFN)

2013- American Heart Association (AHA)