Stanford

Wenfei Sun

Assistant Professor of Medicine (Endocrinology)

Medicine - Endocrinology, Gerontology, & Metabolism

Bio

BIO

Wenfei Sun is an Assistant Professor of Medicine in the Division of Endocrinology at Stanford University. Originally from Zhejiang, China, Sun earned a B.S. from China Pharmaceutical University, an M.S. from Columbia University, and a D.Sc. from ETH Zurich. He performed his doctoral thesis with Prof. Christian Wolfrum, identying novel molecular and cellular circuits that govern adipose tissue formation and function. From 2021–2025, Sun trained as a postdoctoral fellow with Drs. Steve Quake and Tom Südhof at Stanford, where he investigated the cellular and molecular basis of memory engrams, revealed astrocyte–neuron interactions during memory consolidation, and delineated neural circuits underlying socially transmitted food memory. Launching his laboratory at Stanford in 2025, Sun integrates neuroscience, metabolism, and genomics to explore how neural circuits regulate metabolic homeostasis and memory, with an emphasis on neuro-adipose communication and tool building that accelerates discovery.

ACADEMIC APPOINTMENTS

- Assistant Professor, Medicine - Endocrinology, Gerontology, & Metabolism
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Faculty Fellow, Sarafan ChEM-H
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Member, Stanford Diabetes Research Center, (2025- present)

HONORS AND AWARDS

- Research Grant Award, Whitehall Foundation (2026)
- Faculty Scholar, Donald E. and Delia B. Baxter Foundation (2026)
- Rapid Impact Research Award, American Heart Association (2026)
- SNF postdoc fellowship, Schweizerische Nationalfonds (Swiss National Science Foundation) (2023)
- Pfizer Research Prize, Stiftung Pfizer Forschungspreis (Pfizer Research Prize Foundation) (2022)
- Science & SciLifeLab Prize for Young Scientists, Science/AAAS, SciLifeLab (2021)
- SNF postdoc fellowship, Schweizerische Nationalfonds (Swiss National Science Foundation) (2021)
- ETH Medal for outstanding doctoral theses, ETH Zürich (Swiss Federal Institute of Technology in Zürich) (2020)

- Award for Outstanding Self-Financed Students Abroad, Ministry of Education of China (2019)
- Best poster award (1st prize) in 58th International Conference on the Bioscience of Lipids, The International Conference on the Bioscience of Lipids (ICBL) (2017)

PROFESSIONAL EDUCATION

- Doctor of Sciences, ETH Zurich
- Master of Science, Columbia University
- Bachelor of Science, China Pharmaceutical University

LINKS

- Sun Lab Site: https://www.wenfei.org/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Memory and metabolism shape everyday life, from learning a new skill to regulating energy and blood sugar. But how does the brain's wiring create memories, and how does that wiring interact with the body's metabolism? To answer it, we build and apply next-generation genomics and imaging methods that read out activity and connections cell by cell. We combine those measurements with computational analysis to assemble high-resolution "maps" of circuits in the brain and their links to metabolic tissues such as fat. With these maps, we probe how experience, aging, or metabolic state reshape circuits—and how that influences cognition and health. Students in the lab gain hands-on training in molecular biology, spatial/single-cell genomics, and data analysis, while working on questions that bridge neuroscience, bioengineering, and physiology.

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Tao Jin, Eun Sun Song

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Endocrinology (Fellowship Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **MEDAG functions as an A-kinase-anchoring protein in adipocytes.** *Molecular cell*
  Long, F., Ghosh, A., Xu, T., Ding, L., Wu, C., Khandelwal, R., Noé, F., Sun, W., Dong, H., Wang, T., Hoffmann, A., Gardeux, V., Deplancke, et al
  2026
- **Benchmarking cell type and gene set annotation by large language models with AnnDictionary.** *Nature communications*
  Crowley, G., Quake, S. R.
  2025; 16 (1): 9511
- **A human arteriovenous differentiation roadmap reveals vein developmental mechanisms and vascular effects of viruses.** *bioRxiv : the preprint server for biology*
  Ang, L. T., Zheng, S. L., Liu, K. J., Masaltseva, A., Winters, J., von Creytz, I., Jha, S. K., Yin, Q., Qian, C., Xiong, X., Dailamy, A., Xi, E., Alcocer, et al
  2025
- **The TBLR1/TBL1 Co-Factor Complex Acts as a Transcriptional Checkpoint in the Brown Adipose Tissue Response to Prolonged Cold Exposure.** *FASEB journal : official publication of the Federation of American Societies for Experimental Biology*

Koker, S. C., Tsokanos, F., El-Merahbi, R., Jha, A. K., Cicatelli, K., Weber, P., Mhamane, A., Kaltenecker, D., Morigny, P., Loft, A., Klepac, K., Maida, A., Molocea, et al
2025; 39 (15): e70886

- **Single-cell transcriptomics reveals a compartmentalized antiviral interferon response in the nasal epithelium of mice.** *Journal of virology*
  Wang, X., Dong, M., Wu, X., Schnepf, D., Thiel, J., Sun, W., Wolfrum, C., Li, S., Jin, W., Staeheli, P., Ye, L.
  2025: e0141324

- **Unveiling adipose populations linked to metabolic health in obesity.** *Cell metabolism*
  Reinisch, I., Ghosh, A., Noé, F., Sun, W., Dong, H., Leary, P., Dietrich, A., Hoffmann, A., Blüher, M., Wolfrum, C.
  2024

- **Adipose tissue retains an epigenetic memory of obesity after weight loss.** *Nature*
  Hinte, L. C., Castellano-Castillo, D., Ghosh, A., Melrose, K., Gasser, E., Noe, F., Massier, L., Dong, H., Sun, W., Hoffmann, A., Wolfrum, C., Ryden, M., Mejhert, et al
  2024

- **Expression of Intelectin-1, also known as Omentin-1, is related to clinical phenotypes such as overweight, obesity, insulin resistance, and changes after bariatric surgery.** *Scientific reports*
  Czechowski, P., Hagemann, T., Ghosh, A., Sun, W., Dong, H., Noé, F., Niersmann, C., Reinisch, I., Wolfrum, C., Herder, C., Dietrich, A., Blüher, M., Hoffmann, et al
  2024; 14 (1): 22286

- **Single-nucleus transcriptomics identifies separate classes of UCP1 and futile cycle adipocytes.** *Cell metabolism*
  Wang, T., Sharma, A. K., Wu, C., Maushart, C. I., Ghosh, A., Yang, W., Stefanicka, P., Kovanicova, Z., Ukropec, J., Zhang, J., Arnold, M., Klug, M., De Bock, et al
  2024

- **Blood methylation pattern reflects epigenetic remodelling in adipose tissue after bariatric surgery.** *EBioMedicine*
  Muller, L., Hoffmann, A., Bernhart, S. H., Ghosh, A., Zhong, J., Hagemann, T., Sun, W., Dong, H., Noe, F., Wolfrum, C., Dietrich, A., Stumvoll, M., Massier, et al
  2024; 106: 105242

- **The cortical amygdala consolidates a socially transmitted long-term memory.** *Nature*
  Liu, Z., Sun, W., Ng, Y. H., Dong, H., Quake, S. R., Südhof, T. C.
  2024

- **Adipocyte p53 coordinates the response to intermittent fasting by regulating adipose tissue immune cell landscape.** *Nature communications*
  Reinisch, I., Michenthaler, H., Sulaj, A., Moyschewitz, E., Krstic, J., Galhuber, M., Xu, R., Riahi, Z., Wang, T., Vujic, N., Amor, M., Zenezini Chiozzi, R., Wabitsch, et al
  2024; 15 (1): 1391

- **Spatial transcriptomics reveal neuron-astrocyte synergy in long-term memory.** *Nature*
  Sun, W., Liu, Z., Jiang, X., Chen, M. B., Dong, H., Liu, J., Südhof, T. C., Quake, S. R.
  2024

- **Alternative splicing of latrophilin-3 controls synapse formation.** *Nature*
  Wang, S., DeLeon, C., Sun, W., Quake, S. R., Roth, B. L., Südhof, T. C.
  2024

- **Laminin α4 Expression in Human Adipose Tissue Depots and Its Association with Obesity and Obesity Related Traits.** *Biomedicines*
  Hagemann, T., Czechowski, P., Ghosh, A., Sun, W., Dong, H., Noé, F., Wolfrum, C., Blüher, M., Hoffmann, A.
  2023; 11 (10)

- **The obesity-linked human lncRNA AATBC stimulates mitochondrial function in adipocytes.** *EMBO reports*
  Giroud, M., Kotschi, S., Kwon, Y., Le Thuc, O., Hoffmann, A., Gil-Lozano, M., Karbiener, M., Higareda-Almaraz, J. C., Khani, S., Tews, D., Fischer-Posovszky, P., Sun, W., Dong, et al
  2023: e57600

- **Effect of high-dose glucocorticoid treatment on human brown adipose tissue activity: a randomised, double-blinded, placebo-controlled cross-over trial in healthy men.** *EBioMedicine*

Maushart, C. I., Sun, W., Othman, A., Ghosh, A., Senn, J. R., Fischer, J. G., Madoerin, P., Loeliger, R. C., Benz, R. M., Takes, M., Zech, C. J., Chirindel, A., Beuschlein, et al

2023; 96: 104771

- **Inhibition of AXL receptor tyrosine kinase enhances brown adipose tissue functionality in mice.** *Nature communications*

  Efthymiou, V., Ding, L., Balaz, M., Sun, W., Balazova, L., Straub, L. G., Dong, H., Simon, E., Ghosh, A., Perdikari, A., Keller, S., Ghoshdastider, U., Horvath, et al

  2023; 14 (1): 4162

- **Adipogenic and SWAT cells separate from a common progenitor in human brown and white adipose depots.** *Nature metabolism*

  Palani, N. P., Horvath, C., Timshel, P. N., Folkertsma, P., Grønning, A. G., Henriksen, T. I., Peijs, L., Jensen, V. H., Sun, W., Jespersen, N. Z., Wolfrum, C., Pers, T. H., Nielsen, et al

  2023

- **Monoallelic intragenic POU3F2 variants lead to neurodevelopmental delay and hyperphagic obesity, confirming the gene's candidacy in 6q16.1 deletions.** *American journal of human genetics*

  Schönauer, R., Jin, W., Findeisen, C., Valenzuela, I., Devlin, L. A., Murrell, J., Bedoukian, E. C., Pöschla, L., Hantmann, E., Riedhammer, K. M., Hoefele, J., Platzer, K., Biemann, et al

  2023

- **Obesity Is Associated with Distorted Proteoglycan Expression in Adipose Tissue.** *International journal of molecular sciences*

  Meen, A. J., Doncheva, A. I., Böttcher, Y., Dankel, S. N., Hoffmann, A., Blüher, M., Fernø, J., Mellgren, G., Ghosh, A., Sun, W., Dong, H., Noé, F., Wolfrum, et al

  2023; 24 (8)

- **A low-carbohydrate diet induces hepatic insulin resistance and metabolic associated fatty liver disease in mice.** *Molecular metabolism*

  Long, F., Bhatti, M. R., Kellenberger, A., Sun, W., Modica, S., Höring, M., Liebisch, G., Krieger, J. P., Wolfrum, C., Challa, T. D.

  2023: 101675

- **Genetic variants in genes involved in creatine biosynthesis in patients with severe obesity or anorexia nervosa.** *Frontiers in genetics*

  Rajcsanyi, L. S., Hoffmann, A., Ghosh, A., Matrisch-Dinkler, B., Zheng, Y., Peters, T., Sun, W., Dong, H., Noe, F., Wolfrum, C., Herpertz-Dahlmann, B., Seitz, J., de Zwaan, et al

  2023; 14: 1128133

- **Single-cell RNA sequencing identifies MFSD2B in megakaryocyte progenitors as a regulator of vascular senescence** *Atherosclerosis*

  Saeedi, S., Sun, W., Wang, T., Dong, H., Allemann, M., Lee, P., Wolfrum, C., Beer, J.

  2023; 379

- **Myoglobin-mediated lipid shuttling increases adrenergic activation of brown and white adipocyte metabolism and is as a marker of thermogenic adipocytes in humans.** *Clinical and translational medicine*

  Christen, L., Broghammer, H., Rapöhn, I., Möhlis, K., Strehlau, C., Ribas-Latre, A., Gebhardt, C., Roth, L., Krause, K., Landgraf, K., Körner, A., Rohde-Zimmermann, K., Hoffmann, et al

  2022; 12 (12): e1108

- **Architecture of the outbred brown fat proteome defines regulators of metabolic physiology.** *Cell*

  Xiao, H., Bozi, L. H., Sun, Y., Riley, C. L., Philip, V. M., Chen, M., Li, J., Zhang, T., Mills, E. L., Emont, M. P., Sun, W., Reddy, A., Garrity, et al

  2022

- **Metabolic reconstitution of germ-free mice by a gnotobiotic microbiota varies over the circadian cycle.** *PLoS biology*

  Hoces, D., Lan, J., Sun, W., Geiser, T., Staubli, M. L., Cappio Barazzone, E., Arnoldini, M., Challa, T. D., Klug, M., Kellenberger, A., Nowok, S., Faccin, E., Macpherson, et al

  2022; 20 (9): e3001743

- **Remission of obesity and insulin resistance is not sufficient to restore mitochondrial homeostasis in visceral adipose tissue.** *Redox biology*

  Gonzalez-Franquesa, A., Gama-Perez, P., Kulis, M., Szczepanowska, K., Dahdah, N., Moreno-Gomez, S., Latorre-Pellicer, A., Fernandez-Ruiz, R., Aguilar-Mogas, A., Hoffman, A., Monelli, E., Samino, S., Miro-Blanch, et al

  2022; 54: 102353

- **Identification of a regulatory pathway inhibiting adipogenesis via RSPO2.** *Nature metabolism*

  Dong, H., Sun, W., Shen, Y., Baláz, M., Balázová, L., Ding, L., Löffler, M., Hamilton, B., Klöting, N., Blüher, M., Neubauer, H., Klein, H., Wolfrum, et al

2022

- **Analysis of Single-Cell/Nucleus Transcriptome Data in Adipose Tissue.** *Methods in molecular biology (Clifton, N.J.)*
  Sun, W.
  2022; 2448: 291-306

- **GPR180 is a component of TGF beta signalling that promotes thermogenic adipocyte function and mediates the metabolic effects of the adipocyte-secreted factor CTHRC1** *NATURE COMMUNICATIONS*
  Balazova, L., Balaz, M., Horvath, C., Horvath, A., Moser, C., Kovanicova, Z., Ghosh, A., Ghoshdastider, U., Efthymiou, V., Kiehlmann, E., Sun, W., Dong, H., Ding, et al
  2021; 12 (1): 7144

- **Local acetate inhibits brown adipose tissue function.** *Proceedings of the National Academy of Sciences of the United States of America*
  Sun, W., Dong, H., Wolfrum, C.
  2021; 118 (49)

- **Fat for heat.** *Science (New York, N.Y.)*
  Sun, W.
  2021; 374 (6571): 1066

- **Lipolysis drives expression of the constitutively active receptor GPR3 to induce adipose thermogenesis** *CELL*
  Johansen, O., Ma, T., Hansen, J., Markussen, L., Schreiber, R., Reverte-Salisa, L., Dong, H., Christensen, D., Sun, W., Gnad, T., Karavaeva, I., Nielsen, T., Kooijman, et al
  2021; 184 (13): 3502-+

- **Plasticity and heterogeneity of thermogenic adipose tissue** *NATURE METABOLISM*
  Sun, W., Modica, S., Dong, H., Wolfrum, C.
  2021; 3 (6): 751-761

- **Quantification of adipocyte numbers following adipose tissue remodeling** *CELL REPORTS*
  Moser, C., Straub, L. G., Rachamin, Y., Dapito, D. H., Kulenkampff, E., Ding, L., Sun, W., Modica, S., Balaz, M., Wolfrum, C.
  2021; 35 (4): 109023

- **Peroxisomal β-oxidation acts as a sensor for intracellular fatty acids and regulates lipolysis.** *Nature metabolism*
  Ding, L., Sun, W., Balaz, M., He, A., Klug, M., Wieland, S., Caiazzo, R., Raverdy, V., Pattou, F., Lefebvre, P., Lodhi, I. J., Staels, B., Heim, et al
  2021; 3 (12): 1648-1661

- **Lysosomal lipoprotein processing in endothelial cells stimulates adipose tissue thermogenic adaptation.** *Cell metabolism*
  Fischer, A. W., Jaeckstein, M. Y., Gottschling, K., Heine, M., Sass, F., Mangels, N., Schlein, C., Worthmann, A., Bruns, O. T., Yuan, Y., Zhu, H., Chen, O., Ittrich, et al
  2021; 33 (3): 547-564.e7

- **snRNA-seq reveals a subpopulation of adipocytes that regulates thermogenesis** *NATURE*
  Sun, W., Dong, H., Balaz, M., Slyper, M., Drokhlyansky, E., Colleluori, G., Giordano, A., Kovanicova, Z., Stefanicka, P., Balazova, L., Ding, L., Husted, A., Rudofsky, et al
  2020; 587 (7832): 98-+

- **ESRRG and PERM1 Govern Mitochondrial Conversion in Brite/Beige Adipocyte Formation** *FRONTIERS IN ENDOCRINOLOGY*
  Mueller, S., Perdikari, A., Dapito, D. H., Sun, W., Wollscheid, B., Balaz, M., Wolfrum, C.
  2020; 11: 387

- **A Genetic Model to Study the Contribution of Brown and Brite Adipocytes to Metabolism** *CELL REPORTS*
  Challa, T. D., Dapito, D. H., Kulenkampff, E., Kiehlmann, E., Moser, C., Straub, L., Sun, W., Wolfrum, C.
  2020; 30 (10): 3424-+

- **Antioxidants protect against diabetes by improving glucose homeostasis in mouse models of inducible insulin resistance and obesity** *DIABETOLOGIA*
  Straub, L. G., Efthymiou, V., Grandl, G., Balaz, M., Challa, T., Truscello, L., Horvath, C., Moser, C., Rachamin, Y., Arnold, M., Sun, W., Modica, S., Wolfrum, et al
  2019; 62 (11): 2094-2105

- **Human brown adipose tissue is phenocopied by classical brown adipose tissue in physiologically humanized mice** *NATURE METABOLISM*
  de Jong, J. M. A., Sun, W., Pires, N. D., Frontini, A., Balaz, M., Jespersen, N. Z., Feizi, A., Petrovic, K., Fischer, A. W., Bokhari, M., Niemi, T., Nuutila, P., Cinti, et al
  2019; 1 (8): 830-843

- **Environmental and Nutritional Effects Regulating Adipose Tissue Function and Metabolism Across Generations** *ADVANCED SCIENCE*
  Sun, W., von Meyenn, F., Peleg-Raibstein, D., Wolfrum, C.
  2019; 6 (11): 1900275

- **Maternal overnutrition programs hedonic and metabolic phenotypes across generations through sperm tsRNAs** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Sarker, G., Sun, W., Rosenkranz, D., Pelczar, P., Opitz, L., Efthymiou, V., Wolfrum, C., Peleg-Raibstein, D.
  2019; 116 (21): 10547-10556

- **Inhibition of Mevalonate Pathway Prevents Adipocyte Browning in Mice and Men by Affecting Protein Prenylation** *CELL METABOLISM*
  Balaz, M., Becker, A. S., Balazova, L., Straub, L., Mueller, J., Gashi, G., Maushart, C., Sun, W., Dong, H., Moser, C., Horvath, C., Efthymiou, V., Rachamin, et al
  2019; 29 (4): 901-+

- **Fat cells with a sweet tooth** *NATURE*
  Sun, W., Wolfrum, C.
  2019; 565 (7738): 167-168

- **BATLAS: Deconvoluting Brown Adipose Tissue** *CELL REPORTS*
  Perdikari, A., Leparc, G., Balaz, M., Pires, N. D., Lidell, M. E., Sun, W., Fernandez-Albert, F., Mueller, S., Akchiche, N., Dong, H., Balazova, L., Opitz, L., Roder, et al
  2018; 25 (3): 784-+

- **Cold-induced epigenetic programming of the sperm enhances brown adipose tissue activity in the offspring** *NATURE MEDICINE*
  Sun, W., Dong, H., Becker, A. S., Dapito, D. H., Modica, S., Grandl, G., Opitz, L., Efthymiou, V., Straub, L. G., Sarker, G., Balaz, M., Balazova, L., Perdikari, et al
  2018; 24 (9): 1372-+

- **A stromal cell population that inhibits adipogenesis in mammalian fat depots** *NATURE*
  Schwalie, P. C., Dong, H., Zachara, M., Russeil, J., Alpern, D., Akchiche, N., Caprara, C., Sun, W., Schlaudraff, K., Soldati, G., Wolfrum, C., Deplancke, B.
  2018; 559 (7712): 103-+

- **Peroxisome Proliferator Activated Receptor Gamma Controls Mature Brown Adipocyte Inducibility through Glycerol Kinase** *CELL REPORTS*
  Lasar, D., Rosenwald, M., Kiehlmann, E., Balaz, M., Tall, B., Opitz, L., Lidell, M. E., Zamboni, N., Krznar, P., Sun, W., Varga, L., Stefanicka, P., Ukropec, et al
  2018; 22 (3): 760-773

- **Bmp4 Promotes a Brown to White-like Adipocyte Shift** *CELL REPORTS*
  Modica, S., Straub, L. G., Balaz, M., Sun, W., Varga, L., Stefanicka, P., Profant, M., Simon, E., Neubauer, H., Ukropcova, B., Ukropec, J., Wolfrum, C.
  2016; 16 (8): 2243-2258

- **Dietary ratios of n-6/n-3 polyunsaturated fatty acids during maternal pregnancy affect hippocampal neurogenesis and apoptosis in mouse offspring** *NUTRICION HOSPITALARIA*
  Fan, C., Sun, W., Fu, H., Dong, H., Xia, L., Lu, Y., Deckelbaum, R. J., Qi, K.
  2015; 32 (3): 1170-1179