Stanford

Lingyin Li

Professor of Biochemistry

Bio

BIO

Dr. Li is a professor in the Biochemistry Department and ChEM-H Institute at Stanford. She is also a core investigator of the Arc Institute. Her lab works on understanding biochemical mechanisms of the immunotransmitter cGAMP and harnessing it to treat cancer and autoimmunity. She majored in chemistry at University of Science and Technology of China and graduated with a B. En in 2003. She then trained with Dr. Laura Kiessling, a pioneer in chemical biology, at University of Wisconsin-Madison and graduated with a Ph.D in chemistry in 2010. She obtained her postdoctoral training with Dr. Timothy Mitchison at Harvard Medical School, who introduced her to the field of chemical immunology. She started her lab at Stanford in 2015.

ACADEMIC APPOINTMENTS

- Professor, Biochemistry
- Member, Bio-X
- Institute Scholar, Sarafan ChEM-H
- Member, Stanford Cancer Institute

HONORS AND AWARDS

- NIH Pathway to Independence Award, NIH (2015-2018)
- Baxter Foundation Faculty Scholars Award, Donald E. and Delia B. Baxter Foundation (2017-2018)
- NIH New Innovator Award, NIH (2017-2022)
- Ono Pharma Breakthrough Science Initiative Award, Ono Pharma Foundation (2017-2010)
- DOD Breast Cancer Research Program Breakthrough Award Level II, DOD (2018-2021)
- C&En News Talented 12, C&En News (2020)
- Eli Lilly Award in Biological Chemistry, American Chemical Society (2022)

Teaching

COURSES

2025-26

- Biochemistry Department Minicourse: BIOC 202 (Aut)

STANFORD ADVISEES

Med Scholar Project Advisor

Songnan Wang

Doctoral Dissertation Reader (AC)

Anahita Nejatfard, Cassandra Stawicki, Timothy Wu, Xijun Zhu

Orals Chair

Rachel Ee

Doctoral Dissertation Advisor (AC)

Dayanne Carvalho, Rina Wang

Publications

PUBLICATIONS

- **2-5A is an immunotransmitter that fuels RNase L immunity.** *Immunity*
  Wang, S., Li, L.
  2025; 58 (4): 770-772

- **A cGAMP-Containing Hydrogel for Prolonged SARS-CoV-2 Receptor-Binding Domain Subunit Vaccine Exposure Induces a Broad and Potent Humoral Response** *ADVANCED NANOBIOMED RESEARCH*
  Bohnert, V., Gale, E. C., Lahey, L. J., Yan, J., Powell, A. E., Ou, B. S., Carozza, J. A., Li, L., Appel, E. A.
  2024

- **PTER is a N-acetyltaurine hydrolase that regulates feeding and obesity.** *Nature*
  Wei, W., Lyu, X., Markhard, A. L., Fu, S., Mardjuki, R. E., Cavanagh, P. E., Zeng, X., Rajniak, J., Lu, N., Xiao, S., Zhao, M., Moya-Garzon, M. D., Truong, et al
  2024

- **PELI2 is a negative regulator of STING signaling that is dynamically repressed during viral infection.** *Molecular cell*
  Ritchie, C., Li, L.
  2024

- **Identification of the extracellular membrane protein ENPP3 as a major cGAMP hydrolase and innate immune checkpoint.** *Cell reports*
  Mardjuki, R., Wang, S., Carozza, J., Zirak, B., Subramanyam, V., Abhiraman, G., Lyu, X., Goodarzi, H., Li, L.
  2024: 114209

- **Stimulating STING for cancer therapy: Taking the extracellular route.** *Cell chemical biology*
  Li, L.
  2024

- **ENPP1 is an innate immune checkpoint of the anticancer cGAMP-STING pathway in breast cancer.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wang, S., Böhnert, V., Joseph, A. J., Sudaryo, V., Skariah, G., Swinderman, J. T., Yu, F. B., Subramanyam, V., Wolf, D. M., Lyu, X., Gilbert, L. A., Van't Veer, L. J., Goodarzi, et al
  2023; 120 (52): e2313693120

- **Phage anti-CBASS protein simultaneously sequesters cyclic trinucleotides and dinucleotides.** *Molecular cell*
  Cao, X., Xiao, Y., Huiting, E., Cao, X., Li, D., Ren, J., Fedorova, I., Wang, H., Guan, L., Wang, Y., Li, L., Bondy-Denomy, J., Feng, et al
  2023

- **Galectin-1 mediates chronic STING activation in tumors to promote metastasis through MDSC recruitment.** *Cancer research*
  Nambiar, D. K., Viswanathan, V., Cao, H., Zhang, W., Guan, L., Chamoli, M., Holmes, B., Kong, C., Hildebrand, R., Koong, A. J., von Eyben, R., Plevritis, S., Li, et al
  2023

- **Discovery of VH domains that allosterically inhibit ENPP1.** *Nature chemical biology*
  Solomon, P. E., Bracken, C. J., Carozza, J. A., Wang, H., Young, E. P., Wellner, A., Liu, C. C., Sweet-Cordero, E. A., Li, L., Wells, J. A.
  2023

- **Phage anti-CBASS protein simultaneously sequesters cyclic trinucleotides and dinucleotides.** *bioRxiv : the preprint server for biology*

Cao, X., Xiao, Y., Huiting, E., Cao, X., Li, D., Ren, J., Guan, L., Wang, Y., Li, L., Bondy-Denomy, J., Feng, Y.
2023

- **ENPP1's regulation of extracellular cGAMP is a ubiquitous mechanism of attenuating STING signaling.** *Proceedings of the National Academy of Sciences of the United States of America*
  Carozza, J. A., Cordova, A. F., Brown, J. A., AlSaif, Y., Bohnert, V., Cao, X., Mardjuki, R. E., Skariah, G., Fernandez, D., Li, L.
  2022; 119 (21): e2119189119
- **Biochemistry, Cell Biology, and Pathophysiology of the Innate Immune cGAS-cGAMP-STING Pathway.** *Annual review of biochemistry*
  Ritchie, C., Carozza, J. A., Li, L.
  2022
- **Therapeutic Interventions Targeting Innate Immune Receptors: A Balancing Act** *CHEMICAL REVIEWS*
  Cao, X., Cordova, A. F., Li, L.
  2022; 122 (3): 3414-3458
- **Human SLC46A2 Is the Dominant cGAMP Importer in Extracellular cGAMP-Sensing Macrophages and Monocytes.** *ACS central science*
  Cordova, A. F., Ritchie, C., Bohnert, V., Li, L.
  2021; 7 (6): 1073-1088
- **LRRC8A:C/E Heteromeric Channels Are Ubiquitous Transporters of cGAMP.** *Molecular cell*
  Lahey, L. J., Mardjuki, R. E., Wen, X., Hess, G. T., Ritchie, C., Carozza, J. A., Bohnert, V., Maduke, M., Bassik, M. C., Li, L.
  2020
- **Diversity Is a Strength of Cancer Research in the US** *CANCER CELL*
  Merad, M., Posey, A. D., Olivero, O., Singh, P. K., Mouneimne, G., Li, L., Wallace, L. M., Hayes, T. K.
  2020; 38 (3): 297–300
- **Structure-Aided Development of Small-Molecule Inhibitors of ENPP1, the Extracellular Phosphodiesterase of the Immunotransmitter cGAMP.** *Cell chemical biology*
  Carozza, J. A., Brown, J. A., Bohnert, V., Fernandez, D., AlSaif, Y., Mardjuki, R. E., Smith, M., Li, L.
  2020
- **cGAMP as an Adjuvant in Antiviral Vaccines and Cancer Immunotherapy** *BIOCHEMISTRY*
  Ritchie, C., Li, L.
  2020; 59 (18): 1713–15
- **Structural Insights into STING Signaling.** *Trends in cell biology*
  Ergun, S. L., Li, L.
  2020; 30 (5): 399–407
- **Extracellular cGAMP is a cancer cell-produced immunotransmitter involved in radiation-induced anti-cancer immunity.** *Nature cancer*
  Carozza, J. A., Böhnert, V., Nguyen, K. C., Skariah, G., Shaw, K. E., Brown, J. A., Rafat, M., von Eyben, R., Graves, E. E., Glenn, J. S., Smith, M., Li, L.
  2020; 1 (2): 184-196
- **Extracellular cGAMP is a cancer-cell-produced immunotransmitter involved in radiation-induced anticancer immunity** *NATURE CANCER*
  Carozza, J. A., Bohnert, V., Nguyen, K. C., Skariah, G., Shaw, K. E., Brown, J. A., Rafat, M., von Eyben, R., Graves, E. E., Glenn, J. S., Smith, M., Li, L.
  2020; 1 (2): 184-+
- **Development of cGAMP-Luc, a sensitive and precise coupled enzyme assay to measure cGAMP in complex biological samples.** *The Journal of biological chemistry*
  Mardjuki, R. E., Carozza, J. A., Li, L. n.
  2020
- **IFN-Independent STING Signaling: Friend or Foe?** *Immunity*
  Böhnert, V. n., Ritchie, C. n., Li, L. n.
  2020; 53 (1): 8–10

- **ENPP1 antagonists in combination with radiation or checkpoint inhibitors demonstrate antitumor activity in syngeneic mice models of pancreatic adenocarcinoma, neuroblastoma, TNBC, and colon cancer**
  Li, L., Smith, M., Chang, B.
  BMC.2019

- **2 ' 3 '-cGAMP is an immunotransmitter produced by cancer cells and regulated by ENPP1**
  Carozza, J., Bohnert, V., Shaw, K., Khanh Nyugen, Skariah, G., Brown, J., Rafat, M., von Eyben, R., Graves, E., Glenn, J., Smith, M., Li, L.
  AMER CHEMICAL SOC.2019

- **STING Polymer Structure Reveals Mechanisms for Activation, Hyperactivation, and Inhibition.** *Cell*
  Ergun, S. L., Fernandez, D., Weiss, T. M., Li, L.
  2019

- **SLC19A1 Is an Importer of the Immunotransmitter cGAMP.** *Molecular cell*
  Ritchie, C., Cordova, A. F., Hess, G. T., Bassik, M. C., Li, L.
  2019

- **Chemical biology of anti-cancer innate immunity**
  Li, L.
  AMER CHEMICAL SOC.2018

- **STING Signaling Promotes Inflammation in Experimental AcutePancreatitis.** *Gastroenterology*
  Zhao, Q., Wei, Y., Pandol, S. J., Li, L., Habtezion, A.
  2018; 154 (6): 1822

- **STING Signaling Promotes Inflammation in Experimental Acute Pancreatitis** *GASTROENTEROLOGY*
  Zhao, Q., Wei, Y., Pandol, S. J., Li, L., Habtezion, A.
  2018; 154 (6): 1822-+

- **Activation of the STING-Dependent Type I Interferon Response Reduces Microglial Reactivity and Neuroinflammation** *NEURON*
  Mathur, V., Burai, R., Vest, R. T., Bonanno, L. N., Lehallier, B., Zardeneta, M. E., Mistry, K. N., Do, D., Marsh, S. E., Abud, E. M., Blurton-Jones, M., Li, L., Lashuel, et al
  2017; 96 (6): 1290-+

- **Host-Pathogen interactions: Nucleotide circles of life and death.** *Nature chemical biology*
  Li, L.
  2017; 13 (2): 130-131