Stanford

Katrin J Svensson

Assistant Professor of Pathology

NIH Biosketch available Online Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrative Assistant**

  Cevan Smith - Administrative Assistant

  Email csmitty@stanford.edu

Bio

BIO

Dr. Svensson is an Assistant Professor of Pathology in the School of Medicine at Stanford University and one of the Affinity Group Leaders of the Stanford Diabetes Research Center. She is also an Associate Editor at Endocrine Reviews. She received her Ph.D. from Lund University, Sweden and completed her postdoctoral studies with Bruce Spiegelman at Harvard Medical School and the Dana-Farber Cancer Institute, Boston. Her laboratory is dedicated to uncovering new signal transduction pathways and their therapeutic applications for metabolic disorders, including obesity, diabetes, and fatty liver disease. Her lab employs a combination of biochemistry, computational approaches, proteomics, and physiology to characterize hormones with previously unknown functions. Her lab has made several findings in their pursuit to improve metabolic health, including the discovery of Isthmin as a circulating hormone that regulates glucose and lipid homeostasis. Her laboratory is supported by grants from the NIH, American Heart Association, Innovative Medicines Accelerator, SPARK, and Merck.

ACADEMIC APPOINTMENTS

- Assistant Professor, Pathology
- 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

- Head, Stanford Metabolic Core, (2021- present)
- ChemH Faculty Fellow, ChemH, (2021- present)
- Affinity Group Leader, SDRC, Stanford Diabetes Research Center, (2019- present)
- Member, Stanford Diabetes Research Center, (2018- present)

HONORS AND AWARDS

- Churg Research Award, Stanford University (2019)

- McCormick and Gabilan Award, Stanford University (2018)
- K99/R00 Pathway to Independence Award, NIH (2016-2021)
- SRC International Postdoctoral Fellowship, Harvard Medical School (2013-2016)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Advisory Council Working Group, NIH NIDDK (2024 - present)
- Editorial Board, Diabetes (2024 - present)
- SAB, Kyttaro (2024 - present)
- Standing member, NIH POMD study section (2023 - present)
- Associate Editor, Endocrine Reviews (Oxford) (2022 - present)
- Advisory Board, STAR Protocols (Cell Press) (2021 - present)
- Member, The Endocrine Society (2021 - present)
- Member, American Heart Association (2020 - present)
- Member, American Diabetes Association (2018 - present)

PROFESSIONAL EDUCATION

- Postdoctoral training, Harvard Medical School and Dana-Farber Cancer Institute (2017)
- Ph.D., Lund University (2012)
- M.S., Lund University (2006)

PATENTS

- Svensson, K.J., Danneskiold-Samsoee, N.B., Coassolo, L. Lone, B.L.. "United States Peptides for obesity and digestive disorders", Leland Stanford Junior University, Feb 29, 2024
- Blau, H., Nalbandian, M., Svensson, K.J.. "United States Materials and methods for treating cardiac dysfunction", Leland Stanford Junior University, Feb 5, 2024
- Katrin J. Svensson, Laetitia Voilquin. "United States Patent US Patent Application Peptide Compositions for Treating Obesity and Weight Management", Leland Stanford Junior University, Aug 2, 2022
- Katrin J. Svensson, Laetitia Voilquin. "United States Therapeutic Uses of Isthmin Protein", Leland Stanford Junior University, Jul 28, 2021
- Katrin J Svensson, Bruce M Spiegelman. "United States Patent US11291706B2 Methods for identification, assessment, prevention, and treatment of metabolic disorders using slit2 https://patents.google.com/patent/US11291706B2/en", Dana-Farber Cancer Institute, Inc., Jul 16, 2015

LINKS

- Svensson Lab website: http://www.svenssonlabstanford.org/
- Google Scholar Profile: https://scholar.google.com/citations?user=GWsHZo4AAAAJ&hl=en
- Twitter: https://twitter.com/SvenssonLab

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Svensson Laboratory is dedicated to the discovery of new ligands that can control metabolism. We are using a combination of omics, gene editing and physiology approaches to better understand how to target complex diseases such as aging, metabolic diseases, and cancer.

Teaching

COURSES

2023-24

- Advanced Cell Biology: BIO 214, BIOC 224, MCP 221 (Win)

2022-23

- Advanced Cell Biology: BIO 214, BIOC 224, MCP 221 (Win)

2021-22

- Advanced Cell Biology: BIO 214, BIOC 224, MCP 221 (Win)

2020-21

- Advanced Cell Biology: BIO 214, BIOC 224, MCP 221 (Win)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Saranya Chidambaranathan Reghupaty, Lianna Wat, Zeyuan Zhang, Meng Zhao

Doctoral Dissertation Co-Advisor (AC)

Karen Linde-Garelli

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biochemistry (Phd Program)
- Biophysics (Phd Program)
- Cancer Biology (Phd Program)
- Endocrinology (Fellowship Program)

Publications

PUBLICATIONS

- **A PTER-dependent pathway of taurine metabolism linked to energy balance.** *bioRxiv : the preprint server for biology*
  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
- **Size matters: the biochemical logic of ligand type in endocrine crosstalk.** *Life metabolism*
  Lone, J. B., Long, J. Z., Svensson, K. J.
  2024; 3 (1)
- **Mitochondrial uncoupler and retinoic acid synergistically induce differentiation and inhibit proliferation in neuroblastoma.** *bioRxiv : the preprint server for biology*
  Jiang, H., Tiche, S. J., He, C. J., Jedoui, M., Forgo, B., Zhao, M., He, B., Li, Y., Li, A. M., Truong, A. T., Ho, J., Simmermaker, C., Yang, et al
  2024
- **A class of secreted mammalian peptides with potential to expand cell-cell communication.** *Nature communications*
  Wiggenhorn, A. L., Abuzaid, H. Z., Coassolo, L., Li, V. L., Tanzo, J. T., Wei, W., Lyu, X., Svensson, K. J., Long, J. Z.
  2023; 14 (1): 8125
- **Roles of Activin A and Gpnmb in metabolic dysfunction-associated steatotic liver disease (MASLD).** *Diabetes*
  Liu, H., Yerevanian, A., Westerhoff, M., Hastings, M. H., Guerra, J. R., Zhao, M., Svensson, K. J., Cai, B., Soukas, A. A., Rosenzweig, A.
  2023
- **Hallmarks of the metabolic secretome.** *Trends in endocrinology and metabolism: TEM*
  Reghupaty, S. C., Dall, N. R., Svensson, K. J.
  2023
- **A single-cell CRISPRi platform for characterizing candidate genes relevant to metabolic disorders in human adipocytes.** *American journal of physiology. Cell physiology*

Bielczyk-Maczynska, E., Sharma, D., Blencowe, M., Saliba Gustafsson, P., Gloudemans, M. J., Yang, X., Carcamo-Orive, I., Wabitsch, M., Svensson, K. J., Park, C. Y., Quertermous, T., Knowles, J. W., Li, et al
2023

- **Extracellular Vesicles in Systemic Juvenile Idiopathic Arthritis.** *Journal of leukocyte biology*
  Maller, J., Morgan, T., Morita, M., McCarthy, F., Jung, Y., Svensson, K. J., Elias, J. E., Macaubas, C., Mellins, E.
  2023

- **Organism-wide, cell-type-specific secretome mapping of exercise training in mice.** *Cell metabolism*
  Wei, W., Riley, N. M., Lyu, X., Shen, X., Guo, J., Raun, S. H., Zhao, M., Moya-Garzon, M. D., Basu, H., Sheng-Hwa Tung, A., Li, V. L., Huang, W., Wiggenhorn, et al
  2023

- **Protocol for invivo measurement of basal and insulin-stimulated glucose uptake in mouse tissues.** *STAR protocols*
  Zhao, M., Wat, L. W., Svensson, K. J.
  2023; 4 (2): 102179

- **Rapid and accurate deorphanization of ligand-receptor pairs using AlphaFold.** *bioRxiv : the preprint server for biology*
  Danneskiold-Samsøe, N. B., Kavi, D., Jude, K. M., Nissen, S. B., Wat, L. W., Coassolo, L., Zhao, M., Santana-Oikawa, G. A., Broido, B. B., Garcia, K. C., Svensson, K. J.
  2023

- **Mapping transcriptional heterogeneity and metabolic networks in fatty livers at single-cell resolution.** *iScience*
  Coassolo, L., Liu, T., Jung, Y., Taylor, N. P., Zhao, M., Charville, G. W., Nissen, S. B., Yki-Jarvinen, H., Altman, R. B., Svensson, K. J.
  2023; 26 (1): 105802

- **Rapid and accurate deorphanization of ligand-receptor pairs using AlphaFold** *BioRxiv*
  Banhos Danneskiold-Samsøe, N., Kavi, D., Jude, K., Nissen, S., Wat, L., Coassolo, L., Zhao, M., Santana-Oikawa, G., Broido, B., Garcia, K., Svensson, K. J.
  2023

- **A class of secreted mammalian peptides with potential to expand cell-cell communication** *BioRxiv*
  Wiggenhorn, A. L.
  2023

- **A human TRPV1 genetic variant within the channel gating domain regulates pain sensitivity in rodents.** *The Journal of clinical investigation*
  He, S., Zambelli, V. O., Sinharoy, P., Brabenec, L., Bian, Y., Rwere, F., Hell, R. C., Stein Neto, B., Hung, B., Yu, X., Zhao, M., Luo, Z., Wu, et al
  2022

- **New players of the adipose secretome: Therapeutic opportunities and challenges.** *Current opinion in pharmacology*
  Coassolo, L., Dannieskiold-Samsøe, N. B., Zhao, M., Allen, H., Svensson, K. J.
  2022; 67: 102302

- **Phosphoproteomic mapping reveals distinct signaling actions and activation of muscle protein synthesis by Isthmin-1** *eLife*
  Zhao, M., Banhos Danneskiold-Samsøe, N., Ulicna, L., Nguyen, Q., Voilquin, L., Lee, D. E., White, J. P., Jiang, Z., Cuthbert, N., Paramasivam, S., Bielczyk-Maczynska, E., van Rechem, C., Svensson, et al
  2022

- **Organism-wide secretome mapping uncovers pathways of tissue crosstalk in exercise** *BioRxiv*
  Wei, W., et al
  2022

- **Isthmin-1 As A Modulator Of Metabolic Health** *ENDO*
  Zhao, M., Banhos Danneskiold-Samsøe, N., Voilquin, L., Jiang, Z., Svensson, K. J.
  2022

- **Single-cell analysis of non-alcoholic fatty livers identifies a role for the constitutive androstane receptor** *BioRxiv*
  Coassolo, L., Liu, T., Jung, Y., Taylor, N. P., Zhao, M., Charville, G. W., Nissen, S. B., Yki-Jarvinen, H., Altman, R. B., Svensson, K. J.
  2022

- **CROP-Seq: a single-cell CRISPRi platform for characterizing candidate genes relevant to metabolic disorders in human adipocytes** *BioRxiv*

Bielczyk-Maczynska, E., Sharma, D., Blencowe, M., Gustafsson, P. S., Gloudemans, M. J., Xia, X., Carcamo-Orive, I., Wabitsch, M., Svensson, K. J., Park, C. Y., Quertermous, T., Knowles, J. W., Li, et al

2022

- **G protein-coupled receptor 151 regulates glucose metabolism and hepatic gluconeogenesis** *Nature Communications*

  Bielczyk-Maczynska, E., Zhao, M., Zushin, P. H., Schnurr, T. M., Kim, H., Li, J., Sangwung, P., Nallagatla, P., Park, C., Cornn, C., Stahl, A., Svensson, K. J., Knowles, et al

  2022

- **Isthmin-1 is an adipokine that promotes glucose uptake and improves glucose tolerance and hepatic steatosis.** *Cell metabolism*

  Jiang, Z., Zhao, M., Voilquin, L., Jung, Y., Aikio, M. A., Sahai, T., Dou, F. Y., Roche, A. M., Carcamo-Orive, I., Knowles, J. W., Wabitsch, M., Appel, E. A., Maikawa, et al

  2021

- **Mitochondria-Rich Extracellular Vesicles Rescue Patient-Specific Cardiomyocytes From Doxorubicin Injury: Insights Into the SENECA Trial.** *JACC. CardioOncology*

  O'Brien, C. G., Ozen, M. O., Ikeda, G., Vaskova, E., Jung, J. H., Bayardo, N., Santoso, M. R., Shi, L., Wahlquist, C., Jiang, Z., Jung, Y., Zeng, Y., Egan, et al

  2021; 3 (3): 428-440

- **Isolation, culture, and functional analysis of hepatocytes from mice with fatty liver disease.** *STAR protocols*

  Jung, Y., Zhao, M., Svensson, K. J.

  2020; 1 (3): 100222

- **Mesenchymal Stem Cells Rescue Patient-Specific Cardiomyocyte Viability and Function Following Doxorubicin Injury via Microvesicle Mediated Mitochondrial Transfer to Recapitulate Human Clinical Trial Results**

  OBrien, C. G., Ozen, M. O., Vaskova, E., Jung, J., Santoso, M., Shi, L., Wahlquist, C. A., Jiang, Z., Jung, Y., Ikeda, G., Zeng, Y., Sinclair, R., Gee, et al

  LIPPINCOTT WILLIAMS & WILKINS.2020

- **Regulation of Energy Metabolism by Receptor Tyrosine Kinase Ligands.** *Frontiers in physiology*

  Zhao, M. n., Jung, Y. n., Jiang, Z. n., Svensson, K. J.

  2020; 11: 354

- **A CRISPR-based genome-wide screen for adipogenesis reveals new insights into mitotic expansion and lipogenesis** *bioRxiv*

  Hilgendorf, K. I., Johnson, C. T., Han, K., Rabiee, A., Demeter, J., Cheng, R., Zhu, Y., Jiang, Z., Svensson, K. J., Bassik, M. C., Jackson, P. K.

  2020

- **Discovery of Hydrolysis-resistant Isoindoline N-Acyl Amino Acid Analogs that Stimulate Mitochondrial Respiration.** *Journal of medicinal chemistry*

  Lin, H. n., Long, J. Z., Roche, A. M., Svensson, K. J., Dou, F. n., Chang, M. R., Strutzenberg, T. n., Ruiz, C. n., Cameron, M. D., Novick, S. J., Berdan, C. M., Louie, S. n., Nomura, et al

  2018

- **Ablation of PM20D1 reveals N-acyl amino acid control of metabolism and nociception.** *Proceedings of the National Academy of Sciences of the United States of America*

  Long, J. Z., Roche, A. M., Berdan, C. A., Louie, S. M., Roberts, A. J., Svensson, K. J., Dou, F. Y., Bateman, L. A., Mina, A. I., Deng, Z. n., Jedrychowski, M. P., Lin, H. n., Kamenecka, et al

  2018

- **Metastasis Stimulation by Hypoxia and Acidosis-Induced Extracellular Lipid Uptake Is Mediated by Proteoglycan-Dependent Endocytosis** *CANCER RESEARCH*

  Menard, J. A., Christianson, H. C., Kucharzewska, P., Bourseau-Guilmain, E., Svensson, K. J., Lindqvist, E., Chandran, V. I., Kjellen, L., Welinder, C., Bengzon, J., Johansson, M. C., Belting, M.

  2016; 76 (16): 4828-4840

- **The Secreted Enzyme PM20D1 Regulates Lipidated Amino Acid Uncouplers of Mitochondria** *CELL*

  Long, J. Z., Svensson, K. J., Bateman, L. A., Lin, H., Kamenecka, T., Lokurkar, I. A., Lou, J., Rao, R. R., Chang, M. R., Jedrychowski, M. P., Paulo, J. A., Gygi, S. P., Griffin, et al

  2016; 166 (2): 424-435

- **A Secreted Slit2 Fragment Regulates Adipose Tissue Thermogenesis and Metabolic Function** *CELL METABOLISM*

  Svensson, K. J., Long, J. Z., Jedrychowski, M. P., Cohen, P., Lo, J. C., Serag, S., Kir, S., Shinoda, K., Tartaglia, J. A., Rao, R. R., Chedotal, A., Kajimura, S., Gygi, et al

2016; 23 (3): 454-466

- **Exosome and microvesicle mediated phene transfer in mammalian cells** *SEMINARS IN CANCER BIOLOGY*
  Christianson, H. C., Svensson, K. J., Belting, M.
  2014; 28: 31-38

- **Meteorin-like Is a Hormone that Regulates Immune-Adipose Interactions to Increase Beige Fat Thermogenesis** *CELL*
  Rao, R. R., Long, J. Z., White, J. P., Svensson, K. J., Lou, J., Lokurkar, I., Jedrychowski, M. P., Ruas, J. L., Wrann, C. D., Lo, J. C., Camera, D. M., Lachey, J., Gygi, et al
  2014; 157 (6): 1279-1291

- **A Smooth Muscle-Like Origin for Beige Adipocytes** *CELL METABOLISM*
  Long, J. Z., Svensson, K. J., Tsai, L., Zeng, X., Roh, H. C., Kong, X., Rao, R. R., Lou, J., Lokurkar, I., Baur, W., Castellot, J. J., Rosen, E. D., Spiegelman, et al
  2014; 19 (5): 810-820

- **Ablation of PRDM16 and Beige Adipose Causes Metabolic Dysfunction and a Subcutaneous to Visceral Fat Switch** *CELL*
  Cohen, P., Levy, J. D., Zhang, Y., Frontini, A., Kolodin, D. P., Svensson, K. J., Lo, J. C., Zeng, X., Ye, L., Khandekar, M. J., Wu, J., Gunawardana, S. C., Banks, et al
  2014; 156 (1-2): 304-316

- **Cancer cell exosomes depend on cell-surface heparan sulfate proteoglycans for their internalization and functional activity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Christianson, H. C., Svensson, K. J., van Kuppevelt, T. H., Li, J., Belting, M.
  2013; 110 (43): 17380-17385

- **Exosomes reflect the hypoxic status of glioma cells and mediate hypoxia-dependent activation of vascular cells during tumor development** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kucharzewska, P., Christianson, H. C., Welch, J. E., Svensson, K. J., Fredlund, E., Ringner, M., Morgelin, M., Bourseau-Guilmain, E., Bengzon, J., Belting, M.
  2013; 110 (18): 7312-7317

- **Role of extracellular membrane vesicles in intercellular communication of the tumour microenvironment** *BIOCHEMICAL SOCIETY TRANSACTIONS*
  Svensson, K. J., Belting, M.
  2013; 41: 273-276

- **Exosome uptake depends on ERK1/2-heat shock protein 27 signaling and lipid Raft-mediated endocytosis negatively regulated by caveolin-1.** *J Biol Chem.*
  Svensson, K. J., Christianson, H. C., Wittrup, A., Bourseau-Guilmain, E., Lindqvist, E., Svensson, L. M., Morgelin, M., Belting, M., et al
  2013; 2013 Jun 14;288(24):17713-24.

- **Standardization and Utilization of Biobank Resources in Clinical Protein Science with Examples of Emerging Applications** *JOURNAL OF PROTEOME RESEARCH*
  Marko-Varga, G., Vegvari, A., Welinder, C., Lindberg, H., Rezeli, M., Edula, G., Svensson, K. J., Belting, M., Laurell, T., Fehniger, T. E.
  2012; 11 (11): 5124-5134

- **Dermatan Sulfate Is Involved in the Tumorigenic Properties of Esophagus Squamous Cell Carcinoma** *CANCER RESEARCH*
  Thelin, M. A., Svensson, K. J., Shi, X., Bagher, M., Axelsson, J., Isinger-Ekstrand, A., van Kuppevelt, T. H., Johansson, J., Nilbert, M., Zaia, J., Belting, M., Maccarana, M., Malmstrom, et al
  2012; 72 (8): 1943-1952

- **Chondroitin sulfate expression predicts poor outcome in breast cancer** *INTERNATIONAL JOURNAL OF ONCOLOGY*
  Svensson, K. J., Christianson, H. C., Kucharzewska, P., Fagerstrom, V., Lundstedt, L., Borgquist, S., Jirstrom, K., Belting, M.
  2011; 39 (6): 1421-1428

- **Hypoxia triggers a proangiogenic pathway involving cancer cell microvesicles and PAR-2-mediated heparin-binding EGF signaling in endothelial cells** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Svensson, K. J., Kucharzewska, P., Christianson, H. C., Skold, S., Lofstedt, T., Johansson, M. C., Morgelin, M., Bengzon, J., Ruf, W., Belting, M.
  2011; 108 (32): 13147-13152

- **Heparan sulfate proteoglycan-mediated polyamine uptake.** *Methods in molecular biology (Clifton, N.J.)*
  Welch, J., Svensson, K., Kucharzewska, P., Belting, M.
  2011; 720: 327-338

- **Ornithine decarboxylase and extracellular polyamines regulate microvascular sprouting and actin cytoskeleton dynamics in endothelial cells** *EXPERIMENTAL CELL RESEARCH*
  Kucharzewska, P., Welch, J. E., Svensson, K. J., Belting, M.
  2010; 316 (16): 2683-2691

- **Magnetic nanoparticle-based isolation of endocytic vesicles reveals a role of the heat shock protein GRP75 in macromolecular delivery** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Wittrup, A., Zhang, S., Svensson, K. J., Kucharzewska, P., Johansson, M. C., Morgelin, M., Belting, M.
  2010; 107 (30): 13342-13347

- **The polyamines regulate endothelial cell survival during hypoxic stress through PI3K/AKT and MCL-1** *BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS*
  Kucharzewska, P., Welch, J. E., Svensson, K. J., Belting, M.
  2009; 380 (2): 413-418

- **Hypoxia-Mediated Induction of the Polyamine System Provides Opportunities for Tumor Growth Inhibition by Combined Targeting of Vascular Endothelial Growth Factor and Ornithine Decarboxylase** *CANCER RESEARCH*
  Svensson, K. J., Welch, J. E., Kucharzewska, P., Bengtson, P., Bjurberg, M., Pahlman, S., ten Dam, G. B., Persson, L., Belting, M.
  2008; 68 (22): 9291-9301

- **Single chain fragment anti-heparan sulfate antibody targets the polyamine transport system and attenuates polyamine-dependent cell proliferation** *INTERNATIONAL JOURNAL OF ONCOLOGY*
  Welch, J. E., Bengtson, P., Svensson, K., Wittrup, A., Jenniskens, G. J., ten Dam, G. B., van Kuppevelt, T. H., Belting, M.
  2008; 32 (4): 749-756

- **HIV-Tat protein transduction domain specifically attenuates growth of polyamine deprived tumor cells** *MOLECULAR CANCER THERAPEUTICS*
  Mani, K., Sandgren, S., Lilja, J., Cheng, F., Svensson, K., Persson, L., Belting, M.
  2007; 6 (2): 782-788

- **Synthesis and transfection efficiencies of new lipophilic polyamines** *JOURNAL OF MEDICINAL CHEMISTRY*
  Gardner, R. A., Belting, M., Svensson, K., Phanstiel, O.
  2007; 50 (2): 308-318