Stanford



# Gunilla B Jacobson

Technical & Strategic Director, Cyclotron, Rad/Precision Health and Integrated Diagnostics

## Bio

### CURRENT ROLE AT STANFORD

Technical and Strategic Director, Cyclotron and Radiochemistry

### EDUCATION AND CERTIFICATIONS

- Postdoctoral Fellow, Los Alamos National Laboratory , Chemistry (1998)
- Postdoctoral Fellow, University of Texas , Chemical Engineering (1997)
- PhD, Uppsala University, Sweden , Organic Chemistry (1996)

### PATENTS

- Gunilla Jacobson, W. Tumas, K. Johnston. "United States Patent 6,479,708 Biphasic Catalysis in Water/Carbon Dioxide Micellar Systems.", Los Alamos National Laboratory
- Glenn Gale, Joe T. Hillman, Gunilla Jacobson, Bentley Palmer,. "United States Patent 7,250,374 System and Method for Processing a Substrate Using Supercritical Carbon Dioxide Processing.", TEL Ltd.
- Gunilla Jacobson, Deborah Yellowaga. "United States Patent 7,387,868 Treatment of a Dielectric Layer Using Supercritical Carbon Dioxide.", TEL Ltd
- Tatsiana Lobovkina, Richard N, Gunilla B Jacobson, Ramin E. Beygui, Evgenios Neofytou.. "United States Patent US 20130243848 A1 Nanoparticles, Nanoparticles Delivery Methods, and Systems of Delivery.", Stanford University, Mar 13, 2013
- Gunilla Jacobson, R.N. Zare, K. E. Markides, C. Contag. "United States Patent US 2008/0095856 A1 Encapsulated Nanoparticles for Drug Delivery.", Stanford University, May 14, 2007
- Gunilla Jacobson, Subramanyam A Iyer. "United States Patent US 2007/0000519 A1 Removal of Residues from Low-k Dielectric Material in Wafer Processing.", Supercritical Systems Inc., Jun 30, 2005
- Gunilla Jacobson, Robert Kevwitch, Deborah Yellowaga. "United States Patent US 2006/0255012 A1 Removal of Particles from Substrate Surface Using Supercritical Processing", Supercritical Systems Inc., May 10, 2005
- Gunilla Jacobson. "United States Patent US 2006/0219268 Neutralization of Systemic Poisoning in Wafer Processing", Supercritical Systems Inc., Mar 30, 2005
- Gunilla Jacobson, Robert Kevwitch, Marie Lowe. "United States Patent US 2006/0186088 A1 Etching and Cleaning BPSG Material Using Supercritical Processing", Supercritical Systems Inc., Feb 23, 2005
- Gunilla Jacobson, Robert Kevwitch, Deborah Yellowaga. "United States Patent US 2006/0180572 A1 Removal of Post Etch Residue for a Substrate With Open Metal Surfaces", Supercritical Systems Inc., Feb 15, 2005
- Gunilla Jacobson, Bentley Palmer, Shan C. Clark, Vijayakumar S. Ramachandrarao, Subramanyam A. Iyer, Robert Turkot,. "United States Patent US 2006/0102204 A1 Method For Removing A Residue From A Substrate Using Supercritical Carbon Dioxide Processing,", Supercritical Systems Inc., Nov 12, 2004
- Gunilla Jacobson, Bentley Palmer. "United States Patent US 2006/0102208 A1 System For Removing A Residue From A Substrate Using Supercritical Carbon Dioxide Processing", Supercritical Systems Inc., Nov 12, 2004
- Gunilla Jacobson, Marie Lowe, Robert Kevwitch, Brandon Hansen. "United States Patent US 2006/0102591 A1 Method and System For Treating A Substrate Using A Supercritical Fluid", Supercritical Systems Inc., Nov 12, 2004

# Professional

## WORK EXPERIENCE

- Visting Associate Professor - Department of Pediatrics, Stanford School of Medicine (2014 - 2016)
- Docent - Faculty of Science and Technology, Uppsala University (2014 - present)
- Senior Scientist - Department of Neuroscience, Karolinska Institutet (2011 - 2013)
- Senior Research Associate - Department of Chemistry, Stanford University (2004 - 2011)
- Process Development Manager - Supercritical Systems / Tokyo Electron, Ltd, (2002 - 2004)
- Technical Staff Member - Los Alamos National Laboratory (2000 - 2002)
- Research Engineer - Uppsala University PET Center

# Publications

## PUBLICATIONS

- **Microneedle array platforms for drug delivery and biomarker sensing: From skin mechanics guided design to scalable manufacture for clinical utility.** *Journal of controlled release : official journal of the Controlled Release Society*
  Zhou, J., Wu, L., Wyttenbach, M., Lennon, R., Liu, Y., Christian, M., Scherr, S., Charara, M., Kommalapati, R., Blum, J., Chatzilakou, E., Schlueter, A., Theobald, et al
  2026: 114980

- **Tunable Applicator for Microneedle-Based Medical Devices** *ADVANCED MATERIALS TECHNOLOGIES*
  Ilyn, D., Hwang, J., Coates, I. A., Dobson, J., Hung, A. H., Kamat, N. U., Tumbleston, J. R., Dulay, M. T., Jacobson, G. B., DeSimone, J. M.
  2026

- **A microneedle device for rapid dermal interstitial fluid sampling.** *Science advances*
  Hung, A. H., Kamat, N. U., Bermudez, A., Boczek, S. M., Garcia-Marqués, F. J., Tan, Y. L., Hwang, J. L., Sinawang, P. D., Ilyin, D., Jacobson, G. B., Demirci, U., Poplack, S. P., Pitteri, et al
  2025; 11 (39): eadx5492

- **Free-Form Microfluidic Microneedle Array Patches** *ADVANCED FUNCTIONAL MATERIALS*
  Coates, I. A., Driskill, M. M., Rajesh, N. U., Lipkowitz, G., Ilyn, D., Xu, Y., Dulay, M. T., Jacobson, G. B., Tumbleston, J. R., Perry, J. L., Tian, S., DeSimone, J. M.
  2025

- **Lyophilized SARS-CoV-2 self-amplifying RNA vaccines for microneedle Array patch delivery.** *Journal of controlled release : official journal of the Controlled Release Society*
  Driskill, M. M., Coates, I. A., Hurst, P. J., Rajesh, N. U., Dulay, M. T., Waymouth, R. M., Akahata, W., Matsuda, K., Smith, J. F., Jacobson, G. B., Perry, J. L., Tian, S., DeSimone, et al
  2025: 113944

- **3D-Printed Latticed Microneedle Array Patches for Tunable and Versatile Intradermal Delivery.** *Advanced materials (Deerfield Beach, Fla.)*
  Rajesh, N. U., Luna Hwang, J., Xu, Y., Saccone, M. A., Hung, A. H., Hernandez, R. A., Coates, I. A., Driskill, M. M., Dulay, M. T., Jacobson, G. B., Tian, S., Perry, J. L., DeSimone, et al
  2024: e2404606

- **3D-Printed Microarray Patches for Transdermal Applications.** *JACS Au*
  Rajesh, N. U., Coates, I., Driskill, M. M., Dulay, M. T., Hsiao, K., Ilyin, D., Jacobson, G. B., Kwak, J. W., Lawrence, M., Perry, J., Shea, C. O., Tian, S., DeSimone, et al
  2022; 2 (11): 2426-2445

- **3D-Printed Microarray Patches for Transdermal Applications** *JACS AU*
  Rajesh, N. U., Coates, I., Driskill, M. M., Dulay, M. T., Hsiao, K., Ilyin, D., Jacobson, G. B., Kwak, J., Lawrence, M., Perry, J., Shea, C. O., Tian, S., DeSimone, et al
  2022

- **Proceedings: Pathways for Successful Translation of New Imaging Agents and Modalities-Phase III Studies** *JOURNAL OF NUCLEAR MEDICINE*
  Gambhir, S. S., Shankar, L. K., Rosenthal, E., Warram, J. M., Ghesani, M., Hope, T. A., Jacobs, P. M., Jacobson, G. B., Wilson, T., Siegel, B. A.
  2019; 60 (6): 736–44

- **Proceedings - Pathways for Successful Translation of New Imaging Agents and Modalities: Phase III Studies.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*
  Gambhir, S. S., Shankar, L. K., Rosenthal, E., Warram, J. M., Ghesani, M. V., Hope, T. A., Jacobs, P. M., Jacobson, G. B., Wilson, T., Siegel, B. A.
  2019

- **Electrochemically triggered release of acetylcholine from scCO(2) impregnated conductive polymer films evokes intracellular Ca2+ signaling in neurotypic SH-SY5Y cells** *JOURNAL OF CONTROLLED RELEASE*
  Loffler, S., Seyock, S., Nybom, R., Jacobson, G. B., Richter-Dahlfors, A.
  2016; 243: 283-290

- **Electrochemically triggered release of acetylcholine from scCO2 impregnated conductive polymer films evokes intracellular Ca(2+) signaling in neurotypic SH-SY5Y cells.** *Journal of controlled release*
  Löffler, S., Seyock, S., Nybom, R., Jacobson, G. B., Richter-Dahlfors, A.
  2016; 243: 283-290

- **Scaffold-mediated BMP-2 minicircle DNA delivery accelerated bone repair in a mouse critical-size calvarial defect model** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART A*
  Keeney, M., Chung, M. T., Zielins, E. R., Paik, K. J., McArdle, A., Morrison, S. D., Ransom, R. C., Barbhaiya, N., Atashroo, D., Jacobson, G., Zare, R. N., Longaker, M. T., Wan, et al
  2016; 104 (8): 2099-2107

- **Swedish Medical Nanoscience Center at Karolinska Institutet** *NANOTECHNOLOGY REVIEWS*
  Jacobson, G. B., Richter-Dahlfors, A.
  2012; 1 (3): 273-279

- **In Vivo Sustained Release of siRNA from Solid Lipid Nanoparticles** *ACS NANO*
  Lobovkina, T., Jacobson, G. B., Gonzalez-Gonzalez, E., Hickerson, R. P., Leake, D., Kaspar, R. L., Contag, C. H., Zare, R. N.
  2011; 5 (12): 9977-9983

- **Biodegradable Nanoparticles With Sustained Release of Functional siRNA in Skin** *JOURNAL OF PHARMACEUTICAL SCIENCES*
  Jacobson, G. B., Gonzalez-Gonzalez, E., Spitler, R., Shinde, R., Leake, D., Kaspar, R. L., Contag, C. H., Zare, R. N.
  2010; 99 (10): 4261-4266

- **Nanoparticle Formation of Organic Compounds With Retained Biological Activity** *JOURNAL OF PHARMACEUTICAL SCIENCES*
  Jacobson, G. B., Shinde, R., McCullough, R. L., Cheng, N. J., Creasman, A., Beyene, A., Hickerson, R. P., Quan, C., Turner, C., Kaspar, R. L., Contag, C. H., Zare, R. N.
  2010; 99 (6): 2750-2755

- **Sustained release of nucleic acids from polymeric nanoparticles using microemulsion precipitation in supercritical carbon dioxide** *CHEMICAL COMMUNICATIONS*
  Ge, J., Jacobson, G. B., Lobovkina, T., Holmberg, K., Zare, R. N.
  2010; 46 (47): 9034-9036

- **Sustained release of drugs dispersed in polymer nanoparticles** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*
  Jacobson, G. B., Shinde, R., Contag, C. H., Zare, R. N.
  2008; 47 (41): 7880-7882

- **Subcritical water extraction and beta-glucosidase-catalyzed hydrolysis of quercetin glycosides in onion waste** *GREEN CHEMISTRY*
  Turner, C., Turner, P., Jacobson, G., Almgren, K., Waldeback, M., Sjoberg, P., Karlsson, E. N., Markides, K. E.
  2006; 8 (11): 949-959

- **Organic synthesis in water carbon dioxide emulsions** *JOURNAL OF ORGANIC CHEMISTRY*
  Jacobson, G. B., Lee, C. T., daRocha, R. P., Johnston, K. P.
  1999; 64 (4): 1207-1210

- **Organic synthesis in water carbon dioxide microemulsions** *JOURNAL OF ORGANIC CHEMISTRY*

Jacobson, G. B., Lee, C. T., Johnston, K. P.
1999; 64 (4): 1201-1206

- **Biphasic Catalysis in Water/Carbon Dioxide Emulsions,** *Journal of the American Chemical Society*
  Jacobson, G. B., Lee, C. T., Johnston, K. P., Tumas, W. B.
  1999; 121 (50)
- **Synthesis of O-[C-11]acetyl CoA, O-[C-11]acetyl-L-carnitine, L-[C-11]carnitine labelled in specific positions, applied in PET studies on rhesus monkey** *NUCLEAR MEDICINE AND BIOLOGY*
  Jacobson, G. B., Watanabe, Y., Valind, S., Kuratsune, H., Langstrom, B.
  1997; 24 (5): 471-478
- **Acylcarnitine and Chronic Fatigue Syndrome.** *CARNITINE TODAY*
  Kuratsune, H., Yamaguti, K., Watanabe, Y., Takahashi, M., Nakamoto, I., Machii, T., Jacobson, G. B., Onoe, H., Matsumura, K., Valind, S., Långström, B., Kitani, T.
  1997
- **Synthesis of 11 C-Labeled Guanidines in Supercritical Ammonia** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Jacobson, G. B., Westerberg, G., Markides, K. E., Långtsröm, B.
  1997; 118 (29): 6868
- **High Uptake of [2-11C]Acetyl-l-Carnitine into the Brain: A Pet Study** *Biochemical and Biophysical Research Communications*
  Kuratsune, H., Watanabe, Y., Yamaguti, K., Jacobson, G., Takahashi, M., Machii, T., Onoe, H., Onoe, K., Kiyoshi, Valind, S., Kitani, T., Bengt
  1997: 488
- **Supercritical Fluid Extraction of 11C-Labelled Metabolites from Tissue using Supercritical Ammonia.** *ANAL. CHEM.*
  Jacobson, R. B., Moulder, R., Lu, L., Bergström, M., Markides, K. E., Långström, B.
  1997
- **Supercritical Fluid Synthesis and On-line Preparative Supercritical Fluid Chromatography of 11C-Labelled Compounds in Supercritical Ammonia.** *ACTA CHEM. SCAND.*
  Jacobson, G. B., Markides, K. E., Långström, B.
  1997; 51
- **Methodological aspects for in vitro characterization of receptor binding using 11C-Labelled receptor ligands: a detailed study with the benzodiazepine receptor antagonist [11C]Ro 15-1788** *NUCL. MED. BIOL.*
  Sihver, W., Sihver, S., Bergström, M., Murata, T., Matsumura, K., Onoe, H., Andersson, Y., Bjurling, P., Fasth, K., Westerberg, G., Ögren, M., Jacobson, G., Lundqvist, et al
  1997; 24 (8): 723
- **PET and parathyroid L-[carbon-11]methionine accumulation in hyperparathyroidism** *JOURNAL OF NUCLEAR MEDICINE*
  Sundin, A., Johansson, C., Hellman, P., Bergstrom, M., Ahlstrom, H., Jacobson, G. B., Langstrom, B., Rastad, J.
  1996; 37 (11): 1766-1770
- **Levodopa-induced changes in synaptic dopamine in patients with Parkinson's disease as measured by [C-11]raclopride displacement and PET** *NEUROLOGY*
  Tedroff, J., PEDERSEN, M., Aquilonius, S. M., Hartvig, P., Jacobsson, G., Langstrom, B.
  1996; 46 (5): 1430-1436
- **IN-VITRO POSITRON EMISSION TOMOGRAPHY (PET) - USE OF POSITRON EMISSION TRACERS IN FUNCTIONAL IMAGING IN LIVING BRAIN-SLICES** *NEUROSCIENCE RESEARCH*
  Matsumura, K., Bergstrom, M., Onoe, H., Takechi, H., Westerberg, G., Antoni, G., Bjurling, P., Jacobson, G. B., Langstrom, B., Watanabe, Y.
  1995; 22 (2): 219-229
- **Synthesis of [11C]Acetyl-CoA and [11C]Acetyl-L-Carnitine.** *Synth. Appl. Isot. Labelled Compounds*
  Jacobson, G. B., Watanabe, Y., Kuratsune, H., Yamaguchi, K., Onoe , , Kittani , Valind ,
  1995; 118 (29): 375
- **Synthesis of [C-11]acetyl-CoA and [C-11]acetyl-L-carnitine** *5th International Symposium on Synthesis and Applications of Isotopically Labelled Compounds 1994*
  Jacobson, G. B., Watanabe, Y., Kuratsune, H., Yamaguchi, K., Onoe, H., Takahashi, M., Kitani, T., Valind, S., Langstrom, B.

JOHN WILEY & SONS LTD.1995: 375–377

- **Synthesis of C-11-labelled compounds in supercritical ammonia** *5th International Symposium on Synthesis and Applications of Isotopically Labelled Compounds 1994*
  Jacobson, G. B., Markides, K. E., Langstrom, B.
  JOHN WILEY & SONS LTD.1995: 343–346

- **SUPERCRITICAL-FLUID SYNTHESIS IN THE PREPARATION OF BETA(+)-EMITTING LABELED COMPOUNDS** *ACTA CHEMICA SCANDINAVICA*
  Jacobson, G. B., Markides, K. E., Langstrom, B.
  1994; 48 (5): 428-433