

# Stanford

---

## Bin Shen

Senior Research Scientist - Physical, Rad/Molecular Imaging Program at Stanford

### Bio

---

#### CURRENT ROLE AT STANFORD

Manager, Cyclotron & Radiochemistry Facility

#### HONORS AND AWARDS

- Travel grant for 20th International Symposium on Radiopharmaceutical Sciences, Society of Radiopharmaceutical Sciences (2013)
- Travel grant for World Molecular Imaging Congress, World Molecular Imaging Society (2011)
- Travel grant for 19th International Symposium on Radiopharmaceutical Sciences, Society of Radiopharmaceutical Sciences (2011)

#### EDUCATION AND CERTIFICATIONS

- PhD, Universitaet Tuebingen , Radiochemistry/Organic Chemistry (2008)
- M.S. Engineering, Nanjing University of Technology , Bioengineer (2004)

### Publications

---

#### PUBLICATIONS

- **Evaluation of integrin alphavbeta6 cystine knot PET tracers to detect cancer and idiopathic pulmonary fibrosis.** *Nature communications*  
Kimura, R. H., Wang, L., Shen, B., Huo, L., Tummers, W., Filipp, F. V., Guo, H. H., Haywood, T., Abou-Elkacem, L., Baratto, L., Habte, F., Devulapally, R., Witney, et al  
2019; 10 (1): 4673
- **Visualizing Nerve Injury in a Neuropathic Pain Model with [(18)F]FTC-146 PET/MRI.** *Theranostics*  
Shen, B., Behera, D., James, M. L., Reyes, S. T., Andrews, L., Cipriano, P. W., Klukinov, M., Lutz, A. B., Mavlyutov, T., Rosenberg, J., Ruoho, A. E., McCurdy, C. R., Gambhir, et al  
2017; 7 (11): 2794-2805
- **PET imaging of tumor glycolysis downstream of hexokinase through noninvasive measurement of pyruvate kinase M2.** *Science translational medicine*  
Witney, T. H., James, M. L., Shen, B., Chang, E., Pohling, C., Arksey, N., Hoehne, A., Shuhendler, A., Park, J., Bodapati, D., Weber, J., Gowrishankar, G., Rao, et al  
2015; 7 (310): 310ra169-?
- **Positron emission tomography imaging of drug-induced tumor apoptosis with a caspase-triggered nanoaggregation probe.** *Angewandte Chemie (International ed. in English)*  
Shen, B., Jeon, J., Palner, M., Ye, D., Shuhendler, A., Chin, F. T., Rao, J.  
2013; 52 (40): 10511-10514
- **Efficient Method for Site-Specific F-18-Labeling of Biomolecules Using the Rapid Condensation Reaction between 2-Cyanobenzothiazole and Cysteine** *BIOCONJUGATE CHEMISTRY*  
Jeon, J., Shen, B., Xiong, L., Miao, Z., Lee, K. H., Rao, J., Chin, F. T.  
2012; 23 (9): 1902-1908
- **First Experience with Clinical-Grade [F-18]FPP(RGD)(2): An Automated Multi-step Radiosynthesis for Clinical PET Studies** *MOLECULAR IMAGING AND BIOLOGY*  
Chin, F. T., Shen, B., Liu, S., Berganos, R. A., Chang, E., Mitra, E., Chen, X., Gambhir, S. S.

---

2012; 14 (1): 88-95

- **Tau PET imaging with 18F-PI-2620 in aging and neurodegenerative diseases.** *European journal of nuclear medicine and molecular imaging*  
Mormino, E. C., Toueg, T. N., Azevedo, C., Castillo, J. B., Guo, W., Nadiadwala, A., Corso, N. K., Hall, J. N., Fan, A., Trelle, A. N., Harrison, M. B., Hunt, M. P., Sha, et al  
2020
- **Simultaneous Phase-Contrast MRI and PET for Noninvasive Quantification of Cerebral Blood Flow and Reactivity in Healthy Subjects and Patients With Cerebrovascular Disease** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Ishii, Y., Thamm, T., Guo, J., Khalighi, M., Wardak, M., Holley, D., Gandhi, H., Park, J., Shen, B., Steinberg, G. K., Chin, F. T., Zaharchuk, G., Fan, et al  
2020; 51 (1): 183-94
- **Human biodistribution and radiation dosimetry of [18F]DASA-23, a PET probe targeting pyruvate kinase M2.** *European journal of nuclear medicine and molecular imaging*  
Beinat, C., Patel, C. B., Haywood, T., Shen, B., Naya, L., Gandhi, H., Holley, D., Khalighi, M., Iagaru, A., Davidzon, G., Gambhir, S. S.  
2020
- **[F-18]-SuPAR: A Radiofluorinated Probe for Noninvasive Imaging of DNA Damage-Dependent Poly(ADP-ribose) Polymerase Activity** *BIOCONJUGATE CHEMISTRY*  
Shuhendler, A. J., Cui, L., Chen, Z., Shen, B., Chen, M., James, M. L., Witney, T. H., Bazalova-Carter, M., Gambhir, S. S., Chin, F. T., Graves, E. E., Rao, J.  
2019; 30 (5): 1331-42
- **Efficient synthesis of carbon-11 labelled acylsulfonamides using [11C]CO carbonylation chemistry.** *Chemical communications (Cambridge, England)*  
van der Wildt, B., Shen, B., Chin, F. T.  
2019
- **Identifying Hypoperfusion in Moyamoya Disease With Arterial Spin Labeling and an [O-15]-Water Positron Emission Tomography/Magnetic Resonance Imaging Normative Database** *STROKE*  
Fan, A. P., Khalighi, M. M., Guo, J., Ishii, Y., Rosenberg, J., Wardak, M., Park, J., Shen, B., Holley, D., Gandhi, H., Haywood, T., Singh, P., Steinberg, et al  
2019; 50 (2): 373-80
- **Identifying Hypoperfusion in Moyamoya Disease With Arterial Spin Labeling and an [15O]-Water Positron Emission Tomography/Magnetic Resonance Imaging Normative Database.** *Stroke*  
Fan, A. P., Khalighi, M. M., Guo, J., Ishii, Y., Rosenberg, J., Wardak, M., Park, J. H., Shen, B., Holley, D., Gandhi, H., Haywood, T., Singh, P., Steinberg, et al  
2019: STROKEAHA118023426
- **Simultaneous phase-contrast MRI and PET for noninvasive quantification of cerebral blood flow and reactivity in healthy subjects and patients with cerebrovascular disease.** *Journal of magnetic resonance imaging : JMIR*  
Ishii, Y., Thamm, T., Guo, J., Khalighi, M. M., Wardak, M., Holley, D., Gandhi, H., Park, J. H., Shen, B., Steinberg, G. K., Chin, F. T., Zaharchuk, G., Fan, et al  
2019
- **The characterization of 18F-hGTS13 for molecular imaging of xC- transporter activity with positron emission tomography.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*  
Beinat, C., Gowrishankar, G., Shen, B., Alam, I. S., Robinson, E., Haywood, T., Patel, C. B., Azevedo, E. C., Castillo, J., Ilovich, O., Koglin, N., Schmitt-Willich, H., Berndt, et al  
2019
- **Striatal dopamine deficits predict reductions in striatal functional connectivity in major depression: a concurrent 11C-raclopride positron emission tomography and functional magnetic resonance imaging investigation.** *Translational psychiatry*  
Hamilton, J. P., Sacchet, M. D., Hjernevik, T., Chin, F. T., Shen, B., Kampe, R., Park, J. H., Knutson, B. D., Williams, L. M., Borg, N., Zaharchuk, G., Camacho, M. C., Mackey, et al  
2018; 8 (1): 264
- **A [11 C] CO dispensing system for rapid screening of carbonylation reactions.** *Journal of labelled compounds & radiopharmaceuticals*  
van der Wildt, B., Shen, B., Chin, F. T.  
2018
- **Single-Cell Imaging Using Radioluminescence Microscopy Reveals Unexpected Binding Target for [18F]HFB** *MOLECULAR IMAGING AND BIOLOGY*  
Kiru, L., Kim, T., Shen, B., Chin, F. T., Pratz, G.  
2018; 20 (3): 378-87

- **Successful treatment of chronic knee pain following localization by a sigma-1 receptor radioligand and PET/MRI: a case report** *JOURNAL OF PAIN RESEARCH*  
Cipriano, P., Lee, S., Yoon, D., Shen, B., Tawfik, V., Curtin, C., Dragoo, J. L., James, M., Mccurdy, C., Chin, F., Biswal, S.  
2018; 11: 2353–56
- **Production of diverse PET probes with limited resources: 24 F-18-labeled compounds prepared with a single radiosynthesizer** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Collins, J., Waldmann, C. M., Drake, C., Slavik, R., Ha, N. S., Sergeev, M., Lazari, M., Shen, B., Chin, F. T., Moore, M., Sadeghi, S., Phelps, M. E., Murphy, et al  
2017; 114 (43): 11309–14
- **F-FTC-146 in humans.** *Journal of nuclear medicine*  
Hjørnevik, T., Cipriano, P. W., Shen, B., Hyung Park, J., Gulaka, P., Holley, D., Gandhi, H., Yoon, D., Mitra, E. S., Zaharchuk, G., Gambhir, S. S., McCurdy, C. R., Chin, et al  
2017
- **[F]FTC-146.** *Molecular imaging and biology*  
Shen, B., Park, J. H., Hjørnevik, T., Cipriano, P. W., Yoon, D., Gulaka, P. K., Holly, D., Behera, D., Avery, B. A., Gambhir, S. S., McCurdy, C. R., Biswal, S., Chin, et al  
2017
- **Image-derived input function estimation on a TOF-enabled PET/MR for cerebral blood flow mapping.** *Journal of cerebral blood flow and metabolism*  
Khalighi, M. M., Deller, T. W., Fan, A. P., Gulaka, P. K., Shen, B., Singh, P., Park, J., Chin, F. T., Zaharchuk, G.  
2017: 271678X17691784-?
- **Long-Delay Arterial Spin Labeling Provides More Accurate Cerebral Blood Flow Measurements in Moyamoya Patients: A Simultaneous Positron Emission Tomography/MRI Study.** *Stroke*  
Fan, A. P., Guo, J., Khalighi, M. M., Gulaka, P. K., Shen, B., Park, J. H., Gandhi, H., Holley, D., Rutledge, O., Singh, P., Haywood, T., Steinberg, G. K., Chin, et al  
2017; 48 (9): 2441–49
- **receptor.** *EJNMMI research*  
Palner, M., Beinat, C., Banister, S., Zanderigo, F., Park, J. H., Shen, B., Hjoernevik, T., Jung, J. H., Lee, B. C., Kim, S. E., Fung, L., Chin, F. T.  
2016; 6 (1): 80-?
- **Effects of common anesthetic agents on [F-18] flumazenil binding to the GABA(A) receptor** *EJNMMI RESEARCH*  
Palner, M., Beinat, C., Banister, S., Zanderigo, F., Park, J. H., Shen, B., Hjoernevik, T., Jung, J. H., Lee, B. C., Kim, S. E., Fung, L., Chin, F. T.  
2016; 6
- **In vivo assessment of behavioral recovery and circulatory exchange in the peritoneal parabiosis model** *SCIENTIFIC REPORTS*  
Castellano, J. M., Palner, M., Li, S., Freeman, G. M., Andy Nguyen, A., Shen, B., Stan, T., Mosher, K. I., Chin, F. T., de Lecea, L., Luo, J., Wyss-Coray, T.  
2016; 6
- **Striatal dopamine D2/3 receptor regulation by stress inoculation in squirrel monkeys.** *Neurobiology of stress*  
Lee, A. G., Nechvatal, J. M., Shen, B., Buckmaster, C. L., Levy, M. J., Chin, F. T., Schatzberg, A. F., Lyons, D. M.  
2016; 3: 68-73
- **Efficient automated syntheses of high specific activity 6-[(18) F]fluorodopamine using a diaryliodonium salt precursor.** *Journal of labelled compounds & radiopharmaceuticals*  
Neumann, K. D., Qin, L., Vavere, A. L., Shen, B., Miao, Z., Chin, F. T., Shulkin, B. L., Snyder, S. E., DiMagno, S. G.  
2016; 59 (1): 30-34
- **Further validation to support clinical translation of [(18)F]FTC-146 for imaging sigma-1 receptors.** *EJNMMI research*  
Shen, B., James, M. L., Andrews, L., Lau, C., Chen, S., Palner, M., Miao, Z., Arksey, N. C., Shuhendler, A. J., Scatliffe, S., Kaneshige, K., Parsons, S. M., McCurdy, et al  
2015; 5 (1): 49-?
- **Biodistribution of the (18)F-FPPRGD2 PET radiopharmaceutical in cancer patients: an atlas of SUV measurements.** *European journal of nuclear medicine and molecular imaging*  
Minamimoto, R., Jamali, M., Barkhodari, A., Mosci, C., Mitra, E., Shen, B., Chin, F., Gambhir, S. S., Iagaru, A.  
2015; 42 (12): 1850-1858
- **PET imaging of tumor glycolysis downstream of hexokinase through noninvasive measurement of pyruvate kinase M2.** *Science translational medicine*

- Witney, T. H., James, M. L., Shen, B., Chang, E., Pohling, C., Arksey, N., Hoehne, A., Shuhendler, A., Park, J., Bodapati, D., Weber, J., Gowrishankar, G., Rao, et al  
2015; 7 (310): 310ra169-?
- **A Systematic Comparison of 18F-C-SNAT to Established Radiotracer Imaging Agents for the Detection of Tumor Response to Treatment.** *Clinical cancer research*  
Witney, T. H., Hoehne, A., Reeves, R. E., Ilovich, O., Namavari, M., Shen, B., Chin, F. T., Rao, J., Gambhir, S. S.  
2015; 21 (17): 3896-3905
  - **Preclinical Kinetic Analysis of the Caspase-3/7 PET Tracer 18F-C-SNAT: Quantifying the Changes in Blood Flow and Tumor Retention After Chemotherapy.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*  
Palner, M., Shen, B., Jeon, J., Lin, J., Chin, F. T., Rao, J.  
2015; 56 (9): 1415-1421
  - **Single-Cell Analysis of [18F]Fluorodeoxyglucose Uptake by Droplet Radiofluidics.** *Analytical chemistry*  
Türkcan, S., Nguyen, J., Vilalta, M., Shen, B., Chin, F. T., Pratz, G., Abbyad, P.  
2015; 87 (13): 6667-6673
  - **Ether analogues of DPA-714 with subnanomolar affinity for the translocator protein (TSPO)** *EUROPEAN JOURNAL OF MEDICINAL CHEMISTRY*  
Banister, S. D., Beinat, C., Wilkinson, S. M., Shen, B., Bartoli, C., Selleri, S., Da Pozzo, E., Martini, C., Chin, F. T., Kassiou, M.  
2015; 93: 392-400
  - **PET Imaging of Translocator Protein (18 kDa) in a Mouse Model of Alzheimer's Disease Using N-(2,5-Dimethoxybenzyl)-2-18F-Fluoro-N-(2-Phenoxyphenyl)Acetamide.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*  
James, M. L., Belichenko, N. P., Nguyen, T. V., Andrews, L. E., Ding, Z., Liu, H., Bodapati, D., Arksey, N., Shen, B., Cheng, Z., Wyss-Coray, T., Gambhir, S. S., Longo, et al  
2015; 56 (2): 311-316
  - **The relationship between serial [(18)F]PBR06 PET imaging of microglial activation and motor function following stroke in mice.** *Molecular imaging and biology*  
Lartey, F. M., Ahn, G., Ali, R., Rosenblum, S., Miao, Z., Arksey, N., Shen, B., Colomer, M. V., Rafat, M., Liu, H., Alejandre-Alcazar, M. A., Chen, J. W., Palmer, et al  
2014; 16 (6): 821-829
  - **A Radiofluorinated Divalent Cystine Knot Peptide for Tumor PET Imaging** *MOLECULAR PHARMACEUTICS*  
Jiang, L., Kimura, R. H., Ma, X., Tu, Y., Miao, Z., Shen, B., Chin, F. T., Shi, H., Gambhir, S. S., Cheng, Z.  
2014; 11 (11): 3885-3892
  - **(18)F-FPPRGD2 PET/CT: pilot phase evaluation of breast cancer patients.** *Radiology*  
Iagaru, A., Mosci, C., Shen, B., Chin, F. T., Mitra, E., Telli, M. L., Gambhir, S. S.  
2014; 273 (2): 549-559
  - **Comparison of Two Site-Specifically F-18-Labeled Affibodies for PET Imaging of EGFR Positive Tumors** *MOLECULAR PHARMACEUTICS*  
Su, X., Cheng, K., Jeon, J., Shen, B., Venturin, G. T., Hu, X., Rao, J., Chin, F. T., Wu, H., Cheng, Z.  
2014; 11 (11): 3947-3956
  - **Fully Automated Production of Diverse 18F-Labeled PET Tracers on the ELIXYS Multireactor Radiosynthesizer Without Hardware Modification.** *Journal of nuclear medicine technology*  
Lazari, M., Collins, J., Shen, B., Farhoud, M., Yeh, D., Maraglia, B., Chin, F. T., Nathanson, D. A., Moore, M., van Dam, R. M.  
2014; 42 (3): 203-210
  - **PET Imaging of Stroke-Induced Neuroinflammation in Mice Using [F-18]PBR06** *MOLECULAR IMAGING AND BIOLOGY*  
Lartey, F. M., Ahn, G., Shen, B., Cord, K., Smith, T., Chua, J. Y., Rosenblum, S., Liu, H., James, M. L., Chernikova, S., Lee, S. W., Pisani, L. J., Tirouvanziam, et al  
2014; 16 (1): 109-117
  - **Evaluation of s-1 receptor radioligand 18F-FTC-146 in rats and squirrel monkeys using PET.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*  
James, M. L., Shen, B., Nielsen, C. H., Behera, D., Buckmaster, C. L., Mesangeau, C., Zavaleta, C., Vuppala, P. K., Jamalapuram, S., Avery, B. A., Lyons, D. M., McCurdy, C. R., Biswal, et al  
2014; 55 (1): 147-153

- 
- **A F-18-Labeled Saxitoxin Derivative for in Vivo PET-MR Imaging of Voltage-Gated Sodium Channel Expression Following Nerve Injury** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Hoehne, A., Behera, D., Parsons, W. H., James, M. L., Shen, B., Borgohain, P., Bodapati, D., Prabhakar, A., Gambhir, S. S., Yeomans, D. C., Biswal, S., Chin, F. T., Du Bois, et al  
2013; 135 (48): 18012-18015
  - **Integrin-Targeted Molecular Imaging of Experimental Abdominal Aortic Aneurysms by 18F-labeled Arg-Gly-Asp Positron-Emission Tomography.** *Circulation. Cardiovascular imaging*  
Kitagawa, T., Kosuge, H., Chang, E., James, M. L., Yamamoto, T., Shen, B., Chin, F. T., Gambhir, S. S., Dalman, R. L., McConnell, M. V.  
2013; 6 (6): 950-956
  - **Synthesis of ligand-functionalized water-soluble [F-18]YF3 nanoparticles for PET imaging** *NANOSCALE*  
Xiong, L., Shen, B., Behera, D., Gambhir, S. S., Chin, F. T., Rao, J.  
2013; 5 (8): 3253-3256
  - **New Positron Emission Tomography (PET) Radioligand for Imaging sigma-1 Receptors in Living Subjects** *JOURNAL OF MEDICINAL CHEMISTRY*  
James, M. L., Shen, B., Zavaleta, C. L., Nielsen, C. H., Mesangeau, C., Vuppala, P. K., Chan, C., Avery, B. A., Fishback, J. A., Matsumoto, R. R., Gambhir, S. S., McCurdy, C. R., Chin, et al  
2012; 55 (19): 8272-8282
  - **Synthesis of O-[2-[F-18]fluoro-3-(2-nitro-1H-imidazole-1-yl)propyl]tyrosine ([F-18]FNT) as a new class of tracer for imaging hypoxia** *JOURNAL OF RADIOANALYTICAL AND NUCLEAR CHEMISTRY*  
Malik, N., Lin, X., Loeffler, D., Shen, B., Solbach, C., Reischl, G., Voelter, W., Machulla, H.  
2012; 292 (3): 1025-1033
  - **Recent Progress in Radiofluorination of Peptides for PET Molecular Imaging** *CURRENT ORGANIC SYNTHESIS*  
Liu, S., Shen, B., Chin, F. T., Cheng, Z.  
2011; 8 (4): 584-592
  - **Pilot Pharmacokinetic and Dosimetric Studies of F-18-FPPRGD2: A PET Radiopharmaceutical Agent for Imaging alpha(v)beta(3) Integrin Levels** *RADIOLOGY*  
Mittra, E. S., Goris, M. L., Iagaru, A. H., Kardan, A., Burton, L., Berganos, R., Chang, E., Liu, S., Shen, B., Chin, F. T., Chen, X., Gambhir, S. S.  
2011; 260 (1): 182-191