Stanford

Mausam Kalita

Physical Science Research Professional 2, Rad/Molecular Imaging Program at Stanford

Bio

BIO

My vision is to accelerate clinical translation of radiopharmaceuticals by uniting PET/radiotheranostic target discovery, innovative late-stage radiochemistry, and rigorous lead optimization to deliver imaging and therapeutic candidates that are truly clinic-ready. Leveraging open-source AI, spatial biology, and chemistry, my research program will map and quantify innate and adaptive immune cells in the brain—enabling precision diagnostics and treatment monitoring in neurodegeneration and cancer (AD, GBM) and immune dysregulation (GvHD). Building on prior innovations at the chemistry–nanoscience–glycobiology interface and ongoing tracer translation efforts, I will develop a translational discovery engine that advances lead diagnostic and theranostic agents from lab to life.

Specialties: Organic synthesis, Radiochemistry (18F, 11C, 89Zr, 64Cu), material chemistry, carbohydrate chemistry, biochemistry, imaging, neuroimmunology, oncology

CURRENT ROLE AT STANFORD

Senior Research Scientist: a) cold chemical synthesis— Synthesis of the 12C and 19F- HPLC standards and precursors for 11C- and 18F- labeling b) Radiosynthesis— Introduction of 11C or 18F radioisotopes into small molecules to develop novel PET tracers, that can track activated myeloid cells in neurodegenerative disease, c) radiometal labeling— 64Cu and 89Zr labeling of monoclonal antibodies that target immune receptors, d) clinical translation— To follow FDA guidelines for translating preclinically validated tracers into humans in the cyclotron and radiochemistry facility (CRF) of the Stanford University

HONORS AND AWARDS

- Patent: Method for Detecting Innate Immune Action in Vivo Using GPR84-PET PCT/US24/24901, James Lab, Stanford University (April, 2024)
- Co-investigator, Wu Tsai Translate Award, Wu Tsai Neuroscience Institute, Stanford University (January, 2024)
- Cover Article (JACS-Au, 2023, 3, 12, 3297-3310) https://pubs.acs.org/doi/10.1021/jacsau.3c00435, American Chemical Society Journal (December, 2023)
- SNMMI highlights and interview https://www.youtube.com/watch?v=wswYdHf46V0, Society of Nuclear Medicine and Molecular Imaging (June, 2023)
- Top Abstract, World Molecular Imaging Conference, Montreal (September, 2019)
- Invited Speaker, Breaking News Session, Gordon Conference- Proteoglycans (July, 2014)
- Fateley-Hammaker Collaboration in Research Award, Kansas State University (April, 2010)
- Terry C. Johnson basic cancer research award, Kansas State University (May, 2008)

Professional

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Senior Scientist, Stanford University (2021 - present)
- Assistant Research Professional, University of California— San Francisco (2016 - 2021)
- Postdoctoral Scholar, University of Utah (2012 - 2016)

Publications

PUBLICATIONS

- **TREM1-PET imaging maps whole-body innate immune responses in a mouse model of metastatic melanoma.** *Scientific reports*
  Falk, I. N., Chaney, A. M., Verma, R., Kuo, R. C., Reyes, S., Carlson, M., Kalita, M., Azevedo, C., Jackson, I. M., Green, J., Alam, I. S., Tran, A., Pant, et al
  2026

- **A radiolabeled dendrimer non-invasively identifies and tracks innate immune cell activation in a mouse model of experimental autoimmune encephalomyelitis.** *Nature communications*
  Kuo, R. C., Carlson, M. L., Reyes, S. T., Nagy, S. C., Kalita, M., Alam, I. S., Malik, N., Jackson, I. M., Acosta, C. J., Falk, I. N., Azevedo, E. C., Zhang, Y., Nichols, et al
  2026

- **¹⁸F-MGX-110S detects proinflammatory innate immune responses in human cells and Alzheimer's disease mice with high sensitivity**
  Kalita, M., Kuo, R., Reyes, S., Straniero, V., Nagy, S., D'Moore, D., Sundar, M., Setiadi, A., Mak, S., Tuffley, G., Pandrala, M., Marsango, S., Alam, et al
  ELSEVIER SCIENCE INC.2025

- **B7-H4 ImmunoPET Imaging Tracks Tumor-Associated Macrophage Changes in Prostate Cancer.** *Molecular pharmaceutics*
  Kumar, M., Singh, S. B., Vasyliv, I., Habte, F., Kalita, M., Alam, I. S., Koladiya, A., Dai, S. Y., James, M., Rao, J., Beziere, N., Daldrup-Link, H. E.
  2025

- **Advancing In Vivo Detection of T-Cell Function: Development and Preclinical Evaluation of 89Zr-Ivuxolimab, a Human OX40 PET Tracer.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*
  Kalita, M., Kuo, R. C., Reyes, S. T., Colburg, D. R., Falk, I. N., Anders, D., Vermesh, O., Hayee, S., Azevedo, E. C., Nagy, S. C., Deal, E. M., Chen, A. A., Kong, et al
  2025

- **Revealing the suppressors: A new PET imaging approach for detecting MDSCs before and after immunotherapy in a model of brain metastases**
  Kuo, R., Verma, R., Reyes, S., Nagy, S., Kalita, M., D'moore, D., Ehsani, A., Pisani, L., Alam, I., Milligan, G., Lim, M., James, M.
  SOC NUCLEAR MEDICINE INC.2025

- **Early detection and tracking of activated macrophages and microglia in a mouse model of multiple sclerosis using [18F]OP-801 PET imaging before and after a novel immunomodulatory drug**
  Kuo, R., Carlson, M., Malik, N., Reyes, S., Nagy, S., Kalita, M., Alam, I., Jackson, I., Beinat, C., Acosta, C., Falk, I., Azevedo, C., Avci, et al
  SOC NUCLEAR MEDICINE INC.2024

- **Illuminating pro-inflammatory myeloid cells in a murine model of multiple sclerosis using a new 18F-labeled GPR84-targeted radiotracer**
  Reyes, S., Kalita, M., Kuo, R., Straniero, V., Marsango, S., Pandrala, M., Malik, N., Jain, P., Suigo, L., Nagy, S., Wu, T., Valoti, E., Milligan, et al
  SOC NUCLEAR MEDICINE INC.2024

- **Development and comparison of two novel PET tracers for imaging proinflammatory receptor GPR84 in human cells and tissues**
  Nagy, S., Kalita, M., Jackson, I., Reyes, S., Kuo, R., Malik, N., Pandrala, M., Zhang, B., Marsango, S., Straniero, V., Suigo, L., Valoti, E., Alam, et al
  SOC NUCLEAR MEDICINE INC.2024

- **PET Imaging of Innate Immune Activation Using 11C Radiotracers Targeting GPR84.** *JACS Au*
  Kalita, M., Park, J. H., Kuo, R. C., Hayee, S., Marsango, S., Straniero, V., Alam, I. S., Rivera-Rodriguez, A., Pandrala, M., Carlson, M. L., Reyes, S. T., Jackson, I. M., Suigo, et al

2023; 3 (12): 3297-3310

- **Application of Machine Learning Driven Computational Approaches for Novel CNS PET Tracer Development**
  Jackson, I., Luo, A., Webb, E., Zhang, B., Guo, A., Nagy, S., Shao, X., Kuo, R., Carlson, M., Alam, I., Rodriguez, A., Winton, W., Stauff, et al
  ELSEVIER SCIENCE INC.2023: S40-S41

- **Clinical Radiosynthesis and Translation of [18F]OP-801: A Novel Radiotracer for Imaging Reactive Microglia and Macrophages.** *ACS chemical neuroscience*
  Jackson, I. M., Carlson, M. L., Beinat, C., Malik, N., Kalita, M., Reyes, S., Azevedo, E. C., Nagy, S. C., Alam, I. S., Sharma, R., La Rosa, S. A., Moradi, F., Cleland, et al
  2023

- **Development and initial evaluation of a novel 11C-labeled PET tracer to image GPR84 expressing-myeloid cells during neuroinflammation**
  Kalita, M., Park, J., Hayee, S., Marsango, S., Carlson, M., Reyes, S., Nagy, S., Straniero, V., Pandrala, M., Jackson, I., Alam, I., Valoti, E., Milligan, et al
  SOC NUCLEAR MEDICINE INC.2023

- **Antigen-Dependent Inducible T-Cell Reporter System for PET Imaging of Breast Cancer and Glioblastoma.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*
  Shin, J., Parker, M. F., Zhu, I., Alanizi, A., Rodriguez, C. I., Liu, R., Watchmaker, P. B., Kalita, M., Blecha, J., Luu, J., Wright, B., Lapi, S. E., Flavell, et al
  2023; 64 (1): 137-144

- **Iron-Based Magnetic Nanosystems for Diagnostic Imaging and Drug Delivery: Towards Transformative Biomedical Applications** *PHARMACEUTICS*
  Bossmann, S. H., Payne, M. M., Kalita, M., Bristow, R. M. D., Afshar, A., Perera, A. S.
  2022; 14 (10)

- **Glyco-nanotechnology: A biomedical perspective** *NANOMEDICINE-NANOTECHNOLOGY BIOLOGY AND MEDICINE*
  Kalita, M., Payne, M. M., Bossmann, S. H.
  2022; 42: 102542

- **Radiosynthesis and initial preclinical evaluation of [11C]AZD1283 as a potential P2Y12R PET radiotracer.** *Nuclear medicine and biology*
  Jackson, I. M., Buccino, P. J., Azevedo, E. C., Carlson, M. L., Luo, A. S., Deal, E. M., Kalita, M., Reyes, S. T., Shao, X., Beinat, C., Nagy, S. C., Chaney, A. M., Anders, et al
  2022

- **Synthesis and Screening of a-Xylosides in Human Glioblastoma Cells** *MOLECULAR PHARMACEUTICS*
  Kalita, M., Villanueva-Meyer, J., Ohkawa, Y., Kalyanaraman, C., Chen, K., Mohamed, E., Parker, M. F. L., Jacobson, M. P., Phillips, J. J., Evans, M. J., Wilson, D. M.
  2021; 18 (1): 451-460

- **Visualizing antithrombin-binding 3-O-sulfated heparan sulfate motifs on cell surfaces** *CHEMICAL COMMUNICATIONS*
  Kalita, M., Chua, J., Boothello, R. S., Joice, A., Antelope, O., Roy, A., Babu, P., Saijoh, Y., Desai, U. R., Kuberan, B.
  2020; 56 (92): 14423-14426

- **Arabinofuranose-derived positron-emission tomography radiotracers for detection of pathogenic microorganisms** *JOURNAL OF LABELLED COMPOUNDS & RADIOPHARMACEUTICALS*
  Kalita, M., Parker, M. F. L., Luu, J. M., Stewart, M. N., Blecha, J. E., VanBrocklin, H. F., Evans, M. J., Flavell, R. R., Rosenberg, O. S., Ohliger, M. A., Wilson, D. M.
  2020; 63 (5): 231-239

- **A glycan-based approach to therapeutic angiogenesis** *PLOS ONE*
  Chua, J., Tran, V. M., Kalita, M., Quintero, M. V., Antelope, O., Muruganandam, G., Saijoh, Y., Kuberan, B.
  2017; 12 (8): e0182301

- **BODIPY-Conjugated Xyloside Primes Fluorescent Glycosaminoglycans in the Inner Ear of Opsanus tau** *JARO-JOURNAL OF THE ASSOCIATION FOR RESEARCH IN OTOLARYNGOLOGY*
  Holman, H. A., Tran, V. M., Kalita, M., Nguyen, L. N., Arungundram, S., Kuberan, B., Rabbitt, R. D.
  2016; 17 (6): 525-540

- **Synthesis and Biomedical Applications of Xylosides** *GLYCOSAMINOGLYCANS: CHEMISTRY AND BIOLOGY*
  Kalita, M., Quintero, M. V., Raman, K., Tran, V. M., Kuberan, B.
  edited by Balagurunathan, K., Nakato, H., Desai, U. R.
  2015; 1229: 517-528

- **A Nanosensor for Ultrasensitive Detection of Oversulfated Chondroitin Sulfate Contaminant in Heparin** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Kalita, M., Balivada, S., Swarup, V., Mencio, C., Raman, K., Desai, U. R., Troyer, D., Kuberan, B.
  2014; 136 (2): 554-557

- **Nanoplatforms for highly sensitive fluorescence detection of cancer-related proteases** *PHOTOCHEMICAL & PHOTOBIOLOGICAL SCIENCES*
  Wang, H., Udukala, D. N., Samarakoon, T. N., Basel, M. T., Kalita, M., Abayaweera, G., Manawadu, H., Malalasekera, A., Robinson, C., Villanueva, D., Maynez, P., Bossmann, L., Riedy, et al
  2014; 13 (2): 231-240

- **A Hybrid Soft Solar Cell Based on the Mycobacterial Porin MspA Linked to a Sensitizer-Viologen Diad** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Perera, A. S., Subbaiyan, N. K., Kalita, M., Wendel, S. O., Samarakoon, T. N., D'Souza, F., Bossmann, S. H.
  2013; 135 (18): 6842-6845

- **Maleimide-Functionalized Photochromic Spirodihydroindolizines** *JOURNAL OF ORGANIC CHEMISTRY*
  Shrestha, T. B., Kalita, M., Pokhrel, M., Liu, Y., Troyer, D. L., Turro, C., Bossmann, S. H., Duerr, H.
  2013; 78 (5): 1903-1909

- **Channel Blocking of MspA Revisited** *LANGMUIR*
  Perera, A. S., Wang, H., Basel, M. T., Pokhrel, M., Gamage, P., Kalita, M., Wendel, S., Sears, B., Welideniya, D., Liu, Y., Turro, C., Troyer, D. L., Bossmann, et al
  2013; 29 (1): 308-315

- **Direct Synthesis of Aqueous Quantum Dots through 4,4 '-Bipyridine-Based Twin Ligand Strategy** *INORGANIC CHEMISTRY*
  Kalita, M., Cingarapu, S., Roy, S., Park, S., Higgins, D., Jankowiak, R., Chikan, V., Klabunde, K. J., Bossmann, S. H.
  2012; 51 (8): 4521-4526

- **Stem cell-based photodynamic therapy** *PHOTOCHEMICAL & PHOTOBIOLOGICAL SCIENCES*
  Shrestha, T. B., Seo, G. M., Basel, M. T., Kalita, M., Wang, H., Villanueva, D., Pyle, M., Balivada, S., Rachakatla, R., Shinogle, H., Thapa, P. S., Moore, D., Troyer, et al
  2012; 11 (7): 1251-1258

- **MspA porin-gold nanoparticle assemblies: Enhanced binding through a controlled cysteine mutation** *NANO LETTERS*
  Dani, R., Kang, M., Kalita, M., Smith, P. E., Bossmann, S. H., Chikan, V.
  2008; 8 (4): 1229-1236