

Stanford



Mausam Kalita

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

Bio

BIO

The primary goal of my research is to discover imaging and therapeutic solutions to human diseases. I apply chemistry, radiology, and nanotechnology techniques (for example, organic synthesis, radiochemistry, and bioconjugation with metal and non-metal nanoparticles) to image innate and adaptive immune cells in the brain in the context of neurodegenerative diseases (Stanford), bacterial infections (UCSF), treat human glioma (UCSF), and image disease biomarkers (Utah). My research in the chemistry-nanoscience-glycobiology interface has produced several impactful peer-reviewed publications: 1) a nanosensor that diagnoses life-threatening contaminants in pharmaceutical-grade heparin, an anticoagulant used extensively during surgery, 2) heparan sulfate code readers, 3) sugar PET tracers to image bacterial metabolism. I am currently working towards the development of new neuro-PET tracers at Stanford Medical School. In the future, I seek to combine my organic chemistry, radiosynthesis, and cell biology skills to build an independent research program to develop theranostic solutions (diagnosis and therapeutic) to human diseases. 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

- Supplementary Cover Art Article in JACS-Au <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

- **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
- **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
- **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. 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. 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. 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., 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
- **Nanoplatfoms 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 Spiroindolizines** *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