Stanford

Corinne Beinat

Assistant Professor of Radiology (Molecular Imaging Program at Stanford)

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CONTACT INFORMATION

- **Alternate Contact**

  Cara Oakes - Administrative Associate

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Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Radiology - Rad/Molecular Imaging Program at Stanford
- Member, Stanford Cancer Institute

HONORS AND AWARDS

- Alavi-Mandell Award, Society of Nuclear Medicine and Molecular Imaging (2020)
- Stanford Cancer Institute Fellowship, Stanford Cancer Institute (2020)
- Brain Imaging Council Young Investigator Award, Society of Nuclear Medicine and Molecular Imaging (2019)
- The R J W Le Fèvre Research Travelling Scholarship, The School of Chemistry, University of Sydney (2013)
- The John A Lamberton Scholarship, The University of Sydney (2010-2014)
- The University Postgraduate Award Scholarship, The University of Sydney (2010-2014)
- SIRO Top-up Scholarship, CSIRO Materials Science and Engineering, Ian Wark Laboratory (2010-2013)
- Agnes Campbell Postgraduate Prizes, The University of Sydney (2009, 2010, 2011, 2012, 2013, 2014)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Society of Neuro-Oncology (2017 - present)
- Member, Society of Nuclear Medicine and Molecular Imaging (2017 - present)
- Member, World Molecular Imaging Society (2015 - present)
- Member, Royal Australian Chemical Society (2009 - present)

PROFESSIONAL EDUCATION

- PhD, The University of Sydney , Medicinal Chemistry (2014)
- BSc (Hons), The University of Sydney , Organic Chemistry and Pharmacology (2009)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The focus of my research is to develop novel imaging and treatment strategies to detect and better manage cancer. This approach relies first on the identification and validation of molecular targets and biomarkers that are linked with underlying the underlying biology driving the initiation and progression of cancers. We then develop novel small molecule based radiotracers to monitor fundamental molecular and cellular processes occurring in living subjects using positron emission tomography (PET) with the goal of improving cancer diagnosis and management. We additionally develop novel peptide based theragnostic agents for stratification of patients with high receptor expression, treatment with targeted radionuclide therapy, and subsequent monitoring of treatment response. Our overall goal is to develop multiple clinically translatable strategies to improve cancer diagnosis, management, and outcomes.

CLINICAL TRIALS

- [18F]DASA-23 and PET Scan in Evaluating Pyruvate Kinase M2 Expression in Patients With Intracranial Tumors or Recurrent Glioblastoma and Healthy Volunteers, Not Recruiting

Teaching

COURSES

2023-24

- Probes and Applications for Multi-modality Molecular Imaging of Living Subjects: BIOE 224, BMP 224, RAD 224 (Win)

2022-23

- Probes and Applications for Multi-modality Molecular Imaging of Living Subjects: BIOE 224, BMP 224, RAD 224 (Win)

2021-22

- Probes and Applications for Multi-modality Molecular Imaging of Living Subjects: BIOE 224, RAD 224 (Win)

2020-21

- Probes and Applications for Multi-modality Molecular Imaging of Living Subjects: BIOE 224, RAD 224 (Win)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Pierre Cheung, Thomas Guenther, Madeleine Landry, Rim Malek, Abraham Moses

Postdoctoral Research Mentor

Rim Malek

Publications

PUBLICATIONS

- **Carbon-11 Labelling of Benzenesulfonamide Analogues as Novel Radiotracers to Visualize the Pore-forming Activity of Perforin**
  Zhang, B., Pandrala, M., Shen, B., Beinat, C.
  ELSEVIER SCIENCE INC.2023: S221
- **[¹⁸F]hGTS13 for imaging of x_C⁻ transporter activity in high-grade glioma**
  Kendrili, M., Acosta, C., Recht, L., Beinat, C.
  ELSEVIER SCIENCE INC.2023: S163-S164
- **Synthesis and preclinical evaluation of [¹⁸F]DASA-10 a second generation PKM2 specific radiotracer**
  Beinat, C., Malek, R., Kendrili, M., Acosta, C., Habte, F., Recht, L.
  ELSEVIER SCIENCE INC.2023: S35

- **PET imaging of focused-ultrasound enhanced delivery of AAVs into the murine brain.** *Theranostics*
  Ajenjo, J., Seo, J. W., Foiret, J., Wu, B., Raie, M. N., Wang, J., Fite, B. Z., Zhang, N., Malek, R., Beinat, C., Malik, N., Anders, D. A., Ferrara, et al
  2023; 13 (15): 5151-5169

- **Development of [18F]DASA-10 for enhanced imaging of pyruvate kinase M2.** *Nuclear medicine and biology*
  Kendirli, M. T., Malek, R., Silveira, M. B., Acosta, C., Zhang, S., Azevedo, C., Nagy, S. C., Habte, F., James, M. L., Recht, L. D., Beinat, C.
  2023; 124-125: 108382

- **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

- **Multimodal imaging of capsid and cargo reveals differential brain targeting and liver detargeting of systemically-administered AAVs.** *Biomaterials*
  Seo, J. W., Ajenjo, J., Wu, B., Robinson, E., Raie, M. N., Wang, J., Tumbale, S. K., Buccino, P., Anders, D. A., Shen, B., Habte, F. G., Beinat, C., James, et al
  2022: 121701

- **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

- **A Clinical PET Imaging Tracer ([18F]DASA-23) to Monitor Pyruvate Kinase M2 Induced Glycolytic Reprogramming in Glioblastoma.** *Clinical cancer research : an official journal of the American Association for Cancer Research*
  Beinat, C., Patel, C. B., Haywood, T., Murty, S., Naya, L., Castillo, J. B., Reyes, S. T., Phillips, M., Buccino, P., Shen, B., Park, J. H., Koran, M. E., Alam, et al
  2021

- **Initial Clinical Evaluation of [F-18]DASA-23, a PET Imaging Tracer for Evaluation of Aberrantly Expressed Pyruvate Kinase M2 in Glioblastoma**
  Beinat, C., Patel, C., Haywood, T., Naya, L., Castillo, J., Shen, B., Massoud, T., Iagaru, A., Davidzon, G., Recht, L., Gambhir, S.
  SOC NUCLEAR MEDICINE INC.2021

- **Tumor treating fields (TTFields) impairs aberrant glycolysis in glioblastoma as evaluated by [18F]DASA-23, a non-invasive probe of pyruvate kinase M2 (PKM2) expression** *Neoplasia*
  Patel, C. B., Beinat, C., Xie, Y., Chang, E., Gambhir, S. S.
  2021; 23 (1): 58-67

- **Minicircles for a two-step blood biomarker and PET imaging early cancer detection strategy.** *Journal of controlled release : official journal of the Controlled Release Society*
  Robinson, E. R., Gowrishankar, G., D'Souza, A., Kheirolomoom, A., Haywood, T., Hori, S. S., Chuang, H. Y., Zeng, Y., Tumbale, S., Aalipour, A., Beinat, C., Alam, I. S., Sathirachinda, et al
  2021

- **Ultra-high-frequency radio-frequency acoustic molecular imaging with saline nanodroplets in living subjects.** *Nature nanotechnology*
  Chen, Y. S., Zhao, Y. n., Beinat, C. n., Zlitni, A. n., Hsu, E. C., Chen, D. H., Achterberg, F. n., Wang, H. n., Stoyanova, T. n., Dionne, J. n., Gambhir, S. S.
  2021

- **PET reporter gene imaging and ganciclovir-mediated ablation of chimeric antigen receptor T-cells in solid tumors.** *Cancer research*
  Murty, S., Labanieh, L., Murty, T., Gowrishankar, G., Haywood, T., Alam, I. S., Beinat, C., Robinson, E., Aalipour, A., Klysz, D. D., Cochran, J. R., Majzner, R. G., Mackall, et al
  2020

- **Evaluation of Glycolytic Response to Multiple Classes of Anti-glioblastoma Drugs by Noninvasive Measurement of Pyruvate Kinase M2 Using [F-18]DASA-23** *MOLECULAR IMAGING AND BIOLOGY*
  Beinat, C., Patel, C. B., Xie, Y., Gambhir, S. S.
  2020; 22 (1): 124–33

- **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. n., Patel, C. B., Haywood, T. n., Shen, B. n., Naya, L. n., Gandhi, H. n., Holley, D. n., Khalighi, M. n., Iagaru, A. n., Davidzon, G. n., Gambhir, S. S.
  2020

- **Intravital imaging reveals synergistic effect of CAR T-cells and radiation therapy in a preclinical immunocompetent glioblastoma model** *Oncoimmunology*
  Murty, S., Haile, S. T., Beinat, C., Aalipour, A., Alam, I. S., Murty, T., Shaffer, T. M., Patel, C. B., Graves, E. E., Mackall, C. L., Gambhir, S. S.
  2020; 9 (1)

- **EVALUATION OF [18F]DASA-23 FOR NON-INVASIVE MEASUREMENT OF ABERRANTLY EXPRESSED PYRUVATE KINASE M2 IN GLIOMA: FIRST-IN-HUMAN STUDY**
  Patel, C., Beinat, C., Haywood, T., Murty, S., Xie, Y., Recht, L., Nagpal, S., Thomas, R., Khalighi, M., Gandhi, H., Holley, D., Gambhir, S.
  OXFORD UNIV PRESS INC.2019: 169

- **TUMOR TREATING FIELDS LEADS TO CHANGES IN MEMBRANE PERMEABILITY AND INCREASED PENETRATION BY ANTI-GLIOMA DRUGS**
  Chang, E., Patel, C., Beinat, C., Young, C., Flores, T., Zeng, Y., Joubert, L., Arami, H., Natarajan, A., Sinclair, R., Gambhir, S.
  OXFORD UNIV PRESS INC.2019: 93

- **Evaluation of [18F]DASA-23 for non-invasive measurement of aberrantly expressed pyruvate kinase M2 in glioblastoma: preclinical and first in human studies**
  Beinat, C., Patel, C., Haywood, T., Murty, S., Alam, I., Xie, Y., Gandhi, H., Holley, D., Gambhir, S.
  SOC NUCLEAR MEDICINE INC.2019

- **Engineered immune cells as highly sensitive cancer diagnostics** *NATURE BIOTECHNOLOGY*
  Aalipour, A., Chuang, H., Murty, S., D'Souza, A. L., Park, S., Gulati, G. S., Patel, C. B., Beinat, C., Simonetta, F., Martinic, I., Gowrishankar, G., Robinson, E. R., Aalipour, et al
  2019; 37 (5): 531-+

- **Evaluation of Glycolytic Response to Multiple Classes of Anti-glioblastoma Drugs by Noninvasive Measurement of Pyruvate Kinase M2 Using [18F]DASA-23.** *Molecular imaging and biology : MIB : the official publication of the Academy of Molecular Imaging*
  Beinat, C., Patel, C. B., Xie, Y., Gambhir, S. S.
  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. n., Gowrishankar, G. n., Shen, B. n., Alam, I. S., Robinson, E. n., Haywood, T. n., Patel, C. B., Azevedo, E. C., Castillo, J. n., Ilovich, O. n., Koglin, N. n., Schmitt-Willich, H. n., Berndt, et al
  2019

- **Engineered immune cells as highly sensitive cancer diagnostics.** *Nature biotechnology*
  Aalipour, A. n., Chuang, H. Y., Murty, S. n., D'Souza, A. L., Park, S. M., Gulati, G. S., Patel, C. B., Beinat, C. n., Simonetta, F. n., Martini#, I. n., Gowrishankar, G. n., Robinson, E. R., Aalipour, et al
  2019

- **Positron emission tomography reporter gene strategy for use in the central nervous system** *PNAS*
  Haywood, T., Beinat, C., Gowrishankar, G., Patel, C. B., Alam, I. S., Murty, S., Gambhir, S. S.
  2019

- **A NOVEL METABOLIC PET TRACER STRATEGY TO DETERMINE EARLY EFFECTS OF TUMOR TREATING FIELDS (TTFIELDS)**
  Patel, C., Beinat, C., Xie, Y., Haywood, T., Murty, S., Chang, E., Gambhir, S.
  OXFORD UNIV PRESS INC.2018: 32

- **COMPARISON OF THREE METABOLIC PET RADIOTRACERS IN GLIOBLASTOMA: CELL CULTURE AND ANIMAL STUDIES**
  Beinat, C., Patel, C., Murty, S., Haywood, T., Park, J., Xie, Y., Gambhir, S.
  OXFORD UNIV PRESS INC.2018: 34

- **EVALUATION OF GLYCOLYTIC RESPONSE TO SEVEN CLASSES OF ANTI-GLIOBLASTOMA DRUGS BY NON-INVASIVE MEASUREMENT OF PYRUVATE KINASE M2**
  Beinat, C., Patel, C., Xie, Y., Gambhir, S.
  OXFORD UNIV PRESS INC.2018: 33–34

- **A novel synthesis of 6''-[18 F]-fluoromaltotriose as a PET tracer for imaging bacterial infection.** *Journal of labelled compounds & radiopharmaceuticals*
  Namavari, M. n., Gowrishankar, G. n., Srinivasan, A. n., Gambhir, S. S.
  2018

- **The Utility of [18F]DASA-23 for Molecular Imaging of Prostate Cancer with Positron Emission Tomography.** *Molecular imaging and biology : MIB : the official publication of the Academy of Molecular Imaging*
  Beinat, C. n., Haywood, T. n., Chen, Y. S., Patel, C. B., Alam, I. S., Murty, S. n., Gambhir, S. S.
  2018

- **F]DASA-23 for Imaging Tumor Glycolysis Through Noninvasive Measurement of Pyruvate Kinase M2.** *Molecular imaging and biology*
  Beinat, C., Alam, I. S., James, M. L., Srinivasan, A., Gambhir, S. S.
  2017

- **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

- **The Recent Development of alpha(7) Nicotinic Acetylcholine Receptor (nAChR) Ligands as Therapeutic Candidates for the Treatment of Central Nervous System (CNS) Diseases** *CURRENT PHARMACEUTICAL DESIGN*
  Beinat, C., Banister, S. D., Herrera, M., Kassiou, M.
  2016; 22 (14): 2134-2151

- **Pharmacology of Indole and Indazole Synthetic Cannabinoid Designer Drugs AB-FUBINACA, ADB-FUBINACA, AB-PINACA, ADB-PINACA, 5F-AB-PINACA, 5F-ADB-PINACA, ADBICA, and 5F-ADBICA** *ACS CHEMICAL NEUROSCIENCE*
  Banister, S. D., Moir, M., Stuart, J., Kevin, R. C., Wood, K. E., Longworth, M., Wilkinson, S. M., Beinat, C., Buchanan, A. S., Glass, M., Connor, M., McGregor, I. S., Kassiou, et al
  2015; 6 (9): 1546-1559

- **Effects of bioisosteric fluorine in synthetic cannabinoid designer drugs JWH-018, AM-2201, UR-144, XLR-11, PB-22, 5F-PB-22, APICA, and STS-135.** *ACS chemical neuroscience*
  Banister, S. D., Stuart, J., Kevin, R. C., Edington, A., Longworth, M., Wilkinson, S. M., Beinat, C., Buchanan, A. S., Hibbs, D. E., Glass, M., Connor, M., McGregor, I. S., Kassiou, et al
  2015; 6 (8): 1445-58

- **Effects of Bioisosteric Fluorine in Synthetic Cannabinoid Designer Drugs JWH-018, AM-2201, UR-144, XLR-11, PB-22, 5F-PB-22, APICA, and STS-135** *ACS CHEMICAL NEUROSCIENCE*
  Banister, S. D., Stuart, J., Kevin, R. C., Edington, A., Longworth, M., Wilkinson, S. M., Beinat, C., Buchanan, A. S., Hibbs, D. E., Glass, M., Connor, M., McGregor, I. S., Kassiou, et al
  2015; 6 (8): 1445-1458

- **Structure-activity relationships of synthetic cannabinoid designer drug RCS-4 and its regioisomers and C4 homologues** *FORENSIC TOXICOLOGY*
  Banister, S. D., Stuart, J., Conroy, T., Longworth, M., Manohar, M., Beinat, C., Wilkinson, S. M., Kevin, R. C., Hibbs, D. E., Glass, M., Connor, M., McGregor, I. S., Kassiou, et al
  2015; 33 (2): 355-366

- **The Therapeutic Potential of alpha(7) Nicotinic Acetylcholine Receptor (alpha(7) nAChR) Agonists for the Treatment of the Cognitive Deficits Associated with Schizophrenia** *CNS DRUGS*
  Beinat, C., Banister, S. D., Herrera, M., Law, V., Kassiou, M.
  2015; 29 (7): 529-542

- **Structure-activity relationship studies of SEN12333 analogues: Determination of the optimal requirements for binding affinities at alpha 7 nAChRs through incorporation of known structural motifs** *EUROPEAN JOURNAL OF MEDICINAL CHEMISTRY*
  Beinat, C., Reekie, T., Banister, S. D., O'Brien-Brown, J., Xie, T., Olson, T. T., Xiao, Y., Harvey, A., O'Connor, S., Coles, C., Grishin, A., Kolesik, P., Tsanaktsidis, et al
  2015; 95: 277-301

- **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

- **Recent Advances in the Development of Sigma-1 Receptor Ligands** *Australian Journal of Chemistry*

Manohar, M., Banister, S. D., Beinat, C., O'Brien-Brown, J., Kassiou, M.
2015; 68 (4): 600-609

- **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

- **Investigations of amide bond variation and biaryl modification in analogues of alpha 7 nAChR agonist SEN12333** *EUROPEAN JOURNAL OF MEDICINAL CHEMISTRY*
  Beinat, C., Reekie, T., Hibbs, D., Xie, T., Olson, T. T., Xiao, Y., Harvey, A., O'Connor, S., Coles, C., Tsanaktsidis, J., Kassiou, M.
  2014; 84: 200-205

- **Structure-activity relationships of N-substituted 4-(trifluoromethoxy) benzamidines with affinity for GluN2B-containing NMDA receptors** *BIOORGANIC & MEDICINAL CHEMISTRY LETTERS*
  Beinat, C., Banister, S. D., Hoban, J., Tsanaktsidis, J., Metaxas, A., Windhorst, A. D., Kassiou, M.
  2014; 24 (3): 828-830

- **A practical synthesis of (1S,4S)-2,5-diazabicyclo[2.2.1]heptane** *TETRAHEDRON LETTERS*
  Beinat, C., Banister, S. D., McErlean, C. S., Kassiou, M.
  2013; 54 (39): 5345-5347

- **Consequences of linker length alteration of the alpha 7 nicotinic acetylcholine receptor (nAChR) agonist, SEN12333** *BIOORGANIC & MEDICINAL CHEMISTRY LETTERS*
  Beinat, C., Banister, S. D., van Prehn, S., Doddareddy, M. R., Hibbs, D., Sako, M., Chebib, M., Thao Tran, T., Al-Muhtasib, N., Xiao, Y., Kassiou, M.
  2012; 22 (7): 2380-2384

- **Trishomocubane as a scaffold for the development of selective dopamine transporter (DAT) ligands** *BIOORGANIC & MEDICINAL CHEMISTRY LETTERS*
  Banister, S. D., Moussa, I. A., Beinat, C., Reynolds, A. J., Schiavini, P., Jorgensen, W. T., Kassiou, M.
  2011; 21 (1): 38-41

- **Design, Synthesis, and Structure-Affinity Relationships of Regioisomeric N-Benzyl Alkyl Ether Piperazine Derivatives as sigma-1 Receptor Ligands** *JOURNAL OF MEDICINAL CHEMISTRY*
  Moussa, I. A., Banister, S. D., Beinat, C., Giboureau, N., Reynolds, A. J., Kassiou, M.
  2010; 53 (16): 6228-6239

- **Insights into Structure-Activity Relationships and CNS Therapeutic Applications of NR2B Selective Antagonists - See more at: http://www.eurekaselect.com/72752/article#sthash.FVkeRGWN.dpuf** *Current Medicinal Chemistry*
  Beinat, C., Banister, S., Moussa, I., Reynolds, A. J., McErlean, C. S., Kassiou, M.
  2010 ; 17 (34): 4166-90

- **Development of Vesicular Acetylcholine Transporter Ligands: Molecular Probes for Alzheimers Disease - See more at: http://www.eurekaselect.com/71948/article#sthash.dsWtg2ps.dpuf** *Current Bioactive Compounds*
  Giboureau, N., Aumann, K. M., Beinat, C., Kassiou, M.
  2010; 27: 129-155