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SUMMARY

- Versatile radiochemist with demonstrated expertise in the development, *in vitro* cell based evaluation and preclinical imaging application of PET/SPECT probes for cancer.
 - Proficient in mammalian cell culture, cell-based assays and western blots.
 - Experienced in pre-clinical small animal imaging, standard bio-conjugation techniques, and PET/CT image analysis.
 - Experienced working on clinical trials with novel imaging agents.
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EDUCATION:

Panjab University, Chandigarh (INDIA)

PhD, Nuclear Medicine

2016

Panjab University, Chandigarh (INDIA)

MSc, Nuclear Medicine

2010

BSc, Life Sciences (Botany, Zoology, Chemistry)

2008

RESEARCH EXPERIENCE

- **UT Southwestern Medical Center, Dallas (TX), USA**
Instructor April 2022-Present

- **Washington University School of Medicine, Saint Louis (MO), USA**
Postdoctoral Research Scholar

Advisor: Dr. Monica Shokeen

2016-2022

Project 1: Breast cancer imaging with transtuzumab

Project 2: Preclinical development of CD38-targeted [⁸⁹Zr]DFO-daratumumab for imaging multiple myeloma

Project 3: Investigational New Drug (IND) application: Title: "Early Phase I Evaluation of ⁶⁴Cu-LLP2A for imaging multiple myeloma"

Project 4: (a) ⁶⁴Cu-LLP2A PET imaging in different preclinical myeloma mouse models – Kalwrij mouse model with 5TGM1 tumors, NSG mice with U266 tumors and vk*myc mouse model

(b) Evaluating bortezomib therapy response with ⁶⁴Cu-LLP2A PET imaging in U266 subcutaneous and disseminated myeloma mouse models.

Project 5: Exploring CD38 molecular biology and imaging in multiple myeloma using novel CD38 targeted peptides.

Advisor: Dr. Samuel Achilefu

Project 1: Development of [⁸⁹Zr]DFO-elotuzumab for immuno PET imaging of CS1 in multiple myeloma

Project 2: Therapeutic activation of TiO₂-Tf-TC nanoparticles by [⁸⁹Zr]DFO-daratumumab in multiple myeloma tumor model

Project 3: Development of [⁸⁹Zr]DFO-DDR2 antibody for immuno PET imaging in orthotropic breast cancer model

- **PGIMER, Chandigarh, INDIA**
Research Fellow
Advisor: Dr. Baljinder Singh 2013-2016
Project: Characterization and radiolabeling of dendrimers with positron emitters for molecular imaging of tumor angiogenesis.
- **University of Iowa, Iowa City (IA), USA**
Research Fellow
Advisor: Dr. Michael Schultz 2012-2013
Project: Radio-synthesis of [⁶⁸Ga] DOTA-MLN6907 peptide – a GCC specific chelate for clinical radiopharmaceutical production.
- **PGIMER, Chandigarh, INDIA**
Research Fellow
Advisor: Dr. Baljinder Singh 2010-2012
Project: Development of Novel radio ligands for cancer detection using molecular imaging- A Biotechnology Approach.
- **PGIMER, Chandigarh, INDIA**
MSc Dissertation; Advisor: Dr. Baljinder Singh 2009-2010
Project: Radio-pharmacy contamination in Nuclear Medicine – a survey report.

PROFESSIONAL ASSOCIATIONS

Society of Nuclear Medicine, India.
Society of Nuclear Medicine and Molecular Imaging, USA.
World Molecular Imaging Society, USA.

SKILLS AND TECHNIQUES

Conjugation chemistry, characterization techniques
Radiopharmacy and quality control, radiation biology, and radiation dosimetry
Radio-HPLC, analytical HPLC and radio-TLC
Mammalian cell culture, Animal handling and tumor inoculation
PET/CT and SPECT/CT imaging
Image and data analysis
In vitro cell assays and western blot

AWARDS & HONORS

Best Oral paper at the 52nd Annual Conference of Society of Nuclear Medicine, India 2020
Alavi-Mandell award, Society of Nuclear Medicine and Molecular Imaging, USA 2019

STUDENTS TRAINED

- Ms. Kathleen Potter, summer student, Washington University, St. Louis (MO), 2021
- Ms. Eliana Khojasteh, summer student, Washington University, St. Louis (MO), 2021
- Ms. Sooah Ko, undergraduate Student; Washington University, St. Louis (MO), 2019
- Mr. Nicholas Cho, Graduate Student; BME, Washington University, St. Louis (MO), 2017
- Dr. Dominique Fuser, NM Research Fellow, Washington University, St. Louis (MO), 2017

CONFERENCE PRESENTATIONS**Oral presentations**

- ImmunoPET imaging of CS1/SLAMF7 in multiple myeloma using ^{89}Zr -DFO- elotuzumab. 52nd Annual Conference of Society of Nuclear Medicine, (India), Dec 11-13 2020, (virtual conference) AIIMS, Raipur.
- CD 38 targeted ^{89}Zr -daratumumab for imaging multiple myeloma. Annual conference of the Society of Nuclear Medicine (India), Dec 14-17, 2017, INMAS, New Delhi.
- Radio-pharmacy contamination in Nuclear Medicine – a survey report. 42nd Annual conference of the Society of Nuclear Medicine (India), Nov 11-14, 2010, PGIMER, Chandigarh.

Poster presentations

- Evaluation of Radionuclide Stimulated Therapy response in a preclinical multiple myeloma. Society of Nuclear Medicine and Molecular Imaging (SNMMI), virtual conference, Vancouver, Canada (2022).
- *In vivo* quantitative assessment of therapeutic response to bortezomib therapy in disseminated animal models of multiple myeloma with ^{18}F -FDG and ^{64}Cu -LLP2A PET. World Molecular Imaging Congress (WMIC), Oct 5-8, 2021 virtual conference, USA.
- Therapeutic activation of TiO_2 -Tf-TC nanoparticles by ^{89}Zr – daratumumab in multiple myeloma tumor model. Society of Nuclear Medicine and Molecular Imaging (SNMMI), virtual conference, USA (2021).
- Immuno PET imaging of CS1/SLAMF7 in multiple myeloma using [^{89}Zr]DFO- elotuzumab. Society of Nuclear Medicine and Molecular Imaging (SNMMI), virtual conference, USA (2020).
- Phenotyping animal models of multiple myeloma *in vivo*. CMMN NCI visit, St Louis, (2019).
- Synthesis, characterization and radiolabeling of Daratumumab derivatives for PET imaging and targeted alpha therapy of multiple myeloma. Oncologic Imaging Research poster session (2016).
- Animal biodistribution and PET imaging results of ^{68}Ga labeled generation 6 polyamidoamine dendrimers. Society of Nuclear Medicine and Molecular Imaging (SNMMI), San Diego, USA (2016).
- Characterization and radiolabeling of PAMAM dendrimers - novel theranostic targeting vectors with Gallium-68. 3rd Theranostics World congress on Gallium-68 and PRRT, Baltimore, USA (2015).

- Molecular Imaging of Prostate cancer using a new ^{68}Ga labeled peptide. 2nd World Congress on Ga-68 (Generators and Novel Radiopharmaceuticals), Molecular Imaging (PET/CT), Targeted Radionuclide Therapy and Dosimetry: On the way to Personalized Medicine, PGIMER, Chandigarh (2013).
- Radiolabeling, characterization and biodistribution studies of PAMAM dendrimers to explore their potential as drug carriers. Annual Congress of the European Association of Nuclear Medicine, Milan, Italy (2012).

Publications:

Invited Book chapters

Radiolabeled dendrimers as potential PET agents for molecular imaging of tumor angiogenesis. Dendrimers Claudia Maria Simonescu, IntechOpen, DOI: null. Available from: <https://www.intechopen.com/books/dendrimers-fundamentals-and-applications/radiolabeled-dendrimers-as-potential-pet-agents-for-molecular-imaging-of-tumor-angiogenesis>
Ghai A, Chopra S, Singh B (2018). Intech Open. (April 25th 2018).

Journal articles

- First-in-Human Evaluation of Safety and Dosimetry of ^{64}Cu -LLP2A for PET Imaging. Laforest R*, **Ghai A***, Fraum, TJ, Oyama R, Frye, J, Kaemmerer H, Gaehle G, Voller T, MPoy C, Rogers B, Fiala M, Shoghi KI, Achilefu S, Rettig M, Vij R, DiPersio J F, Schwarz, Shokeen M, Dehdashti F. J Nucl Med. 2022. *Accepted (In Press)*.
- Ablation of VLA4 in multiple myeloma cells redirects tumor spread and prolongs survival. Hathi D, Chanswangphuwana C, Cho N, Fontana F, Ritchey J, O'Neal J, **Ghai A**, Duncan K, Akers W, Rettig M, Shokeen M. Scientific Reports. 2022. 12 (1), 1.
- *In vivo* quantitative assessment of therapeutic response to bortezomib therapy in disseminated animal models of multiple myeloma with [^{18}F]FDG and [^{64}Cu]Cu-LLP2A PET. **Ghai A**, Fetting N, Fontana F, DiPersio J, Rettig M, O'Neal J, Achilefu S, Shoghi K, Shokeen M. Eur J Nucl Med Mol Imaging Research. 2021. 11:97.
- Development of [^{89}Zr]DFO-elotuzumab for immunoPET imaging of CS1 in multiple myeloma. **Ghai A**, Zheleznyak A, Mixdorf M, Neal Julie O, Ritchey J, Rettig M, DiPersio J, Shokeen M, Achilefu S. Eur J Nucl Med Mol Imaging. 2021. 48:1302-1311.
- Osteotropic Radiolabeled Nanophotosensitizer for Imaging and Treating Multiple Myeloma. Tang R, Zheleznyak A, Mixdorf M, **Ghai A**, Prior J, Achilefu S. ACS Nano. 2020 Apr 28; 14(4):4255-4264.
- Radiosynthesis and pre-clinical evaluation of [^{68}Ga] labeled antimicrobial peptide fragment GF-17 as a potential infection imaging PET radiotracer. Chopra S, Singh B, Koul A, Mishra A.K, Kaur A, **Ghai A**, Caplash N, Wester H-J. App Rad Isot. 2019; 149:9-21.
- Optimizing the radiosynthesis of [^{68}Ga]DOTA-MLN6907 peptide containing three disulfide cyclization bonds – a GCC specific chelate for clinical radiopharmaceuticals. **Ghai A**, Singh B, Li M, Daniels TA, Coelho R, Orcutt K, Watkins GL, Norenberg JP, Cvet D, Schultz MK. App Rad Isot. 2018; 140:333-341.
- Preclinical development of CD38-targeted [^{89}Zr]Zr-DFO-daratumumab for imaging multiple myeloma. **Ghai A**, Maji D, Cho N, Chanswangphuwana C, Rettig M, DiPersio J, Akers W, Dehdashti F, Achilefu S, Vij R and Shokeen M. J Nucl. Med 2018;

59:216-222.

- Radio-synthesis of [¹⁸F]fluorobenzoate -doxorubicin using acylation approach. Kumar P, Watts A, Acharya P, Bansal R, **Ghai A**, Kaur A, Singh B. Curr Radiopharm. 2016; 9: 215-221.
- Radiolabeling optimization and characterization of ⁶⁸Ga labeled DOTA-Polyamido-amine dendrimer conjugate—animal biodistribution and PET imaging Results. **Ghai A**, Singh B, Hazari PP, Schultz MK, Parmar A, Kumar PR, Sharma S, Dhawan DK, Mishra AK. App Rad Isot. 2015; 105: 40–46.
- Development of a single vial kit formulation of [^{99m}Tc]-labeled doxorubicin for tumor imaging and treatment response assessment -preclinical evaluation and preliminary human results. Kumar P, Singh B, **Ghai A**, Hazari PP, Mittal BR, Mishra AK. J Labelled Comp Radiopharm. 2015; 58 (6):242-249.
- Preclinical evaluation of [^{99m}Tc] labeled gefitinib as a potential scintigraphic probe for the detection of tumors expressing epidermal growth factor receptors. Kumar P, Singh B, **Ghai A**, Chuttani K, Dhawan DK, Mittal BR, Mishra AK. App Rad Isot. 2015; 99: 41-45.
- Midodrine and clonidine in patients with Cirrhosis and refractory or recurrent ascites: A randomized pilot study. Singh V, Singh A, Singh B, Vijayverghia R, Sharma N, **Ghai A**, Bhalla A. Am J Gastroenterol. 2013 Apr; 108(4): 560-7.
- Preclinical evaluation of [^{99m}Tc]-labeled doxorubicin as a potential scintigraphic probe for tumor imaging. Kumar P, Singh B, Sharma S, **Ghai A**, Chuttani K, Mishra AK, Dhawan D, Mittal BR. Cancer Biother Radiopharm. 2012 Apr; 27(3):221-5. Epub 2012 Mar 20.

- Radio-synthesis of [¹⁸F]fluorobenzoate -doxorubicin using acylation approach. Kumar P, Watts A, Acharya P, Bansal R, **Ghai A**, Kaur A, Singh B. Curr Radiopharm. 2016; 9: 215-221.
- Radiolabeling optimization and characterization of ⁶⁸Ga labeled DOTA-Polyamido-amine dendrimer conjugate–animal biodistribution and PET imaging Results. **Ghai A**, Singh B, Hazari PP, Schultz MK, Parmar A, Kumar PR, Sharma S, Dhawan DK, Mishra AK. App Rad Isot. 2015; 105: 40–46.
- Development of a single vial kit formulation of [99m]Tc-labeled doxorubicin for tumor imaging and treatment response assessment -preclinical evaluation and preliminary human results. Kumar P, Singh B, **Ghai A**, Hazari PP, Mittal BR, Mishra AK. J Labelled Comp Radiopharm. 2015; 58 (6):242-249.
- Preclinical evaluation of [99mTc] labeled gefitinib as a potential scintigraphic probe for the detection of tumors expressing epidermal growth factor receptors. Kumar P, Singh B, **Ghai A**, Chuttani K, Dhawan DK, Mittal BR, Mishra AK. App Rad Isot. 2015; 99: 41-45.
- Midodrine and clonidine in patients with Cirrhosis and refractory or recurrent ascites: A randomized pilot study. Singh V, Singh A, Singh B, Vijayverghia R, Sharma N, **Ghai A**, Bhalla A. Am J Gastroenterol. 2013 Apr; 108(4): 560-7.
- Preclinical evaluation of [99m] Tc-labeled doxorubicin as a potential scintigraphic probe for tumor imaging. Kumar P, Singh B, Sharma S, **Ghai A**, Chuttani K, Mishra AK, Dhawan D, Mittal BR. Cancer Biother Radiopharm. 2012 Apr; 27(3):221-5. Epub 2012 Mar 20.