

**Shreya Goel, Ph.D.**

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**SUMMARY**

My research program focusses on the use and development of molecular imaging and nanobiotechnology tools to refine the way we visualize, treat and manage cancer and other diseases. We implement multimodal molecular imaging technologies, in particular, positron emission tomography, computer tomography, and optical and optoacoustic imaging to interrogate the biophysical microenvironment of a disease before, during and after treatment. We also harness these technologies to delineate the pharmacokinetics of macromolecular and nanomaterials-based therapies in vivo at multiple spatio-temporal lengthscales. By using cutting-edge technologies, we intend to: 1) enable biology-guided modulation of the disease microenvironment to convert non-responders to responders, and 2), guide rational design of effective and innovative therapies; which will have outstanding impact on biological and medical sciences.

**CURRENT POSITION**

**University of Utah, College of Pharmacy, Salt Lake City, UT** 08/2021 - Present  
**Assistant Professor, Department of Pharmaceutics and Pharmaceutical Chemistry**

**EDUCATION AND TRAINING**

**MD Anderson Cancer Center, Houston, TX** 02/2020- 07/2021  
Research Investigator, Cancer Systems Imaging Mentor: **Dr. Mark D. Pagel**

**MD Anderson Cancer Center, Houston, TX** 07/2019- 01/2020  
Postdoctoral Fellow, Cancer Systems Imaging Mentor: **Dr. Mark D. Pagel**

**Houston Methodist Research Institute, Houston, TX** 08/2017- 06/2019  
Postdoctoral Fellow, Cancer Systems Imaging Mentor: **Dr. Mauro Ferrari**

**University of Wisconsin-Madison, Madison, WI** 09/2012 – 06/2017  
Ph.D. Materials Science Mentor: **Dr. Weibo Cai**

**University of Wisconsin-Madison, Madison, WI** 09/2012 – 04/2014  
M.S. Materials Science Mentor: **Dr. Weibo Cai**

**Indian Institute of Technology, Roorkee, India** 07/2010 – 06/2012  
M.Tech Nanotechnology Mentors: **Dr. R. Jayaganathan and Dr. R. Chandra**

**Integral University, Lucknow, India** 07/2006 – 05/2010  
B.Tech Biotechnology

**PREVIOUS RESEARCH EXPERIENCE**

**Research Investigator, MD Anderson Cancer Center (PI: Dr. Mark D. Pagel)** 2020-2021

- Development of quantitative imaging biomarkers for perfusion and hypoxia to evaluate disease progression in cancer and diabetic wound healing models.
- Multiparametric evaluation of therapeutic responses of vasculature disruptive agents and radiotherapy in breast and pancreatic tumor models using quantitative multispectral optoacoustic tomography (MSOT)

- Evaluation of hypoxia in metastatic lymph nodes in patients with gynecological cancers.

**Postdoctoral Fellow, Houston Methodist Research Institute (PI: Dr. Mauro Ferrari) 2017-2019**

- Engineering a multiscale imaging toolkit to deconstruct in vivo transport of multistage drug delivery vectors in metastatic breast cancers.
- Evaluation of clonal heterogeneity as a deterministic factor in immunotherapy resistance (collaboration with Dr. Kenji Yokoi)
- Mapping the dynamic changes in physical microenvironment with progression of pulmonary metastases in breast cancer.

**Graduate Research Assistant, University of Wisconsin- Madison (PI: Dr. Weibo Cai) 2012-2017**

- Development of biodegradable and renal clearable theranostic agents focusing on PET/optical imaging and photothermal/photodynamic therapy.
- Development of novel nanomaterials for angiogenesis-targeted PET imaging and image-guided drug delivery.
- Development and characterization of antibody and antibody fragments for molecular imaging

**GATE Masters Scholar, Indian Institute of Technology Roorkee (PI: Dr. Ramesh Chandra, Dr. R. Jayaganathan) 2011-2012**

- Low temperature deposition of titania and ZnO thin films via magnetron sputtering and effects of annealing for biomedical and orthopaedic and implantable devices.

**Khorana Scholar, University of Wisconsin- Madison (PI: Dr. Weibo Cai) 05/2011-08/2011**

- Development of antibody and graphene-based agents for angiogenesis targeted theranostics.

**Visiting Fellow, Tata Institute of Fundamental Research (PI: Dr. Ullas Kolthur) 01/2010-04/2011**

- Cloning and overexpression Of Sirt1 exon2 from mouse testes into *E.coli* for the purpose of generation of antibodies

## **AWARDS AND HONORS**

SNMMI 2021 Ones to Watch	2021
HMRI – Rice University Innovative Collaboration Grant Award, Runner-up	2018
Travel Award, SNMMI Annual Meeting 2017, Denver	2017
University of Wisconsin Dissertation Completion Fellowship, awarded to top students from leading graduate schools	2016
Student Research Grant Competition Conference Presentation Award, University of Wisconsin – Madison	2016
Travel Award, RSNA 2016, Chicago	2016
Travel Award, WMIC 2016, New York	2016
1 <sup>st</sup> Place Poster Award, WMIC 2016, New York	2016
Travel Award, SNMMI Annual Meeting 2016, San Diego	2016
Travel Award, SNMMI Annual Meeting 2015, Baltimore	2015
Khorana Scholarship, awarded to 15 students in India for research abroad in UW-Madison	2011
IIT Master Sandwich Scholarship, for research abroad in Germany, DAAD (Declined)	2011
Summer Research Fellowship, Indian Academy of Sciences (Declined)	2011
National Scholarship Award, MHRD, Government of India	2010-2012
GATE Scholar, Graduate Aptitude Test in Engineering; All India Rank 306	2010
All India Rank 9, National Level Biotechnology Talent Search Examination	2009

**MENTORSHOP EXPERIENCE**

- Cerise Siamof (Undergraduate Research Scholar Program, UW - Madison) 2016 – 2020
- Grace Isaakson (Graduate Student, UT Health Science Center at Houston) Summer 2020
- Raquel Erb (Undergraduate, Rice University) Spring 2019
- Kinnari Karia (Undergraduate Research Program, UT Dallas) Summer 2017
- Carolina A. Ferreira (Graduate Student, UW - Madison) 2015 – 2017
- Brooke Aschbacher (Undergraduate Research Scholar Program, UW - Madison) 2016 –2017
- Peter Ji (Undergraduate, UW - Madison) Summer 2016
- Brooke Wassenaar (Undergraduate, UW - Madison) Spring 2016
- Kevin Cao (Undergraduate, UW - Madison) 2015 – 2016
- Shijie Luan (Undergraduate, China Pharmaceutical University) Fall 2014

**SCHOLARLY PUBLICATIONS**

*Citations:* 3970; *h-index:* 34; *i-10 index:* 52 (Google Scholar, as of 2021/08/20)

**Peer-Reviewed Articles (\*: Equal Contribution; †: Corresponding Author)**

1. Ferreira CA\*, **Goel S\***, Ni D, Ehlerding EB, Rosenkrans ZT, Jiang D, Sun T, Alucio-Sarduy E, Engle JW, Cai W. Ultrasmall Porous Silica Nanoparticles with Enhanced Pharmacokinetics for Cancer Theranostics. **Nano Letters**, 2021; 21, 4692. (PMID: 34029471)
2. Shi S, **Goel S**, Lan X, Cai W. ImmunoPET of CD38 with a radiolabeled nanobody: promising for clinical translation. **Eur J Nucl Med Mol Imaging**, 2021; 021, 05329. (PMID: 33942140)
3. **Goel S**†, Shen H, Ferrari M. Engineering multistage delivery vectors for multimodal imaging. **Bio-protocol**, 2021.
4. Liu YT, **Goel S**, Kai M, Guerrero JAM, Nguyen T, Mai J, Shen H, Ziemys A, Yokoi K. Seed and soil dependent differences in murine breast tumor microenvironments dictate anti-Pd-L1 IgG delivery and therapeutic efficacy. **Pharmaceutics**, 2021; 13, 530. (PMID: 33920216)
5. **Goel S**, Zhang G, Dogra P, Nizzero S, Li Z, Cristini V, Wang Z, Shen H, Ferrari M. Sequential deconstruction of multiscale transport of composite drug in metastatic breast cancer. **Science Advances**, 2020; 6, eaba4498. (PMID: 32637609)
6. Siamof C, Cai W, **Goel S\***†. Moving beyond the pillars of cancer treatment: Perspectives from Nanotechnology, **Frontiers in Chemistry**, 2020; 8: 598100. (PMID: 33240859)
7. **Goel S**, Ferreira CA, Dogra P, Yu B, Siamof CA, Kuttyreff CJ, Engle JW, Cai W. Size-optimized Ultrasmall Porous Silica Nanoparticles Depict Vasculature-based Differential Targeting in Triple Negative Breast Cancer. **Small**, 2019; 15, 1903747. (PMID: 31565854)
8. **Goel S**, Dubey P, Ray S, Jayaganthan R, Pant AB, Chandra R. Co-sputtered Antibacterial and Biocompatible Nanocomposite Titania-Zinc Oxide thin films on Si substrates for Dental Implant applications. **Materials Technology**, 2018; 34; 32-42.
9. **Goel S**, Ferreira CA, Chen F, Valdovinos HF, Aschbacher B, Ji P, Barnhart TE, Cai W. Activatable Hybrid Nanotheranostics for Tetramodal Imaging and Synergistic Photothermal/Photodynamic Therapy, **Advanced Materials**, 2018; 30, 1704367. (PMID: 29266476)
10. Yu B\*, **Goel S\***, Ni D, Ellison PA, Siamof CM, Jiang D, Cheng L, Kang L, Yu F, Liu Z, Barnhart TE, He Q, Zhang H, Cai W. Reassembly of <sup>89</sup>Zr-labeled Cancer Cell Membranes into Multicompartment Membrane-derived Liposomes for PET-trackable Tumor-targeted Theranostics, **Advanced Materials**, 2018; 30, 1704934. (PMID: 29430735)

11. Chen F, **Goel S\***, Shi S, Barnhart TE, Lan X, Cai W. General synthesis of silica-based yolk/shell hybrid nanomaterials and in vivo tumor vasculature targeting. **Nano Research**, 2018.
12. **Goel S†**, Ni D, Cai W. Harnessing the Power of Nanotechnology for Enhanced Radiation Therapy. **ACS Nano**, 2017; 11, 4890-4904. (PMID: 30410684)
13. **Goel S**, England CG, Chen F, Cai W. Positron Emission Tomography and Nanotechnology: A Dynamic Duo for Cancer Theranostics. **Advanced Drug Delivery Reviews**, 2017;113, 157-176. (PMID: 27521055)
14. Koziolova E\*, **Goel S\***, Chytil P, Janouskova O, Barnhart TE, Cai W, Etrych T. Tumor-targeted polymer theranostics platform for positron emission tomography and fluorescence imaging. **Nanoscale**, 2017; 30, 10906-10918. (PMID: 28731080)
15. Luo D, **Goel S\***, Liu H-J, Carter KA, Jiang D, Geng J, Kuttyreff CJ, Engle JW, Huang W-C, Shao S, Fang C, Cai W, Lovell JF. Intrabilayer <sup>64</sup>Cu labeling of photoactivatable, doxorubicin-loaded stealth liposomes. **ACS Nano**, 2017; 11, 12482-12491. (PMID: 29195037)
16. Chakravarty R, **Goel S\***, Dash A, Cai W. Radiolabeled inorganic nanoparticles for positron emission tomography imaging of cancer: an overview. **The Quarterly Journal of Nuclear Medicine and Molecular Imaging**, 2017; 61, 81-204. (PMID: 28124549)
17. **Goel S\***, Chen, F\*, Luan, S, Valdovinos, H, Shi, S, Graves, S, Ai, F, Barnhart, T, Theuer, C, Cai, W. Engineering of Intrinsically Zirconium-89 Radiolabeled Self-Destructing Mesoporous Silica Nanostructures for In Vivo Tumor Vasculature Targeting. **Advanced Science**, 2016; 3, 1600122. (PMID: 27980987)
18. Chen F\*, **Goel S\***, Hernandez R\*, Graves S, Shi S, Nickles R, Cai W. Dynamic Positron Emission Tomography Imaging of Renal Clearable Gold Nanoparticles. **Small**, 2016; 12, 2775-82. (PMID: 27062146)
19. Kamkaew A\*, Cheng L\*, **Goel S\***, Valdovinos HF, Barnhart TE, Liu Z, Cai W. Cerenkov Radiation Induced Photodynamic Therapy Using Chlorin e6-Loaded Hollow Mesoporous Silica Nanoparticles. **ACS Applied Materials Interfaces**, 2016; 8, 26630-26637. (PMID: 27657487)
20. Ai F\*, **Goel S\***, Zhan Y\*, Valdovinos HF, Chen F, Barnhart TE, Cai W. Intrinsically <sup>89</sup>Zr-Labeled Gd<sub>2</sub>O<sub>2</sub>S:Eu Nanophosphors with High In Vivo Stability for Dual-modality Imaging. **American Journal of Translational Research**, 2016; 8, 5591-5600. (PMID: 28078029)
21. Ehlerding EB, **Goel S\***, Cai W. Cancer theranostics with <sup>64</sup>Cu/<sup>177</sup>Lu-loaded liposomes. **European Journal of Nuclear Medicine and Molecular Imaging**, 2016; 43, 938-940. (PMID: 26743898)
22. Chen F\*, **Goel S.\***, Valdovinos HF, Luo H, Hernandez R, Barnhart TE, Cai W. In Vivo Integrity and Biological Fate of Chelator-Free Zirconium-89-Labeled Mesoporous Silica Nanoparticles. **ACS Nano**, 2015; 9, 7950-9. (PMID: 26213260)
23. **Goel S**, Chen F, Cai W. Highlights from the latest articles in nano-oncology. **Nanomedicine**, 2015; 10, 897-8. (PMID: 25867855)
24. **Goel S**, Chen, F, & Cai, W. Highlights from the latest articles in nanomedicine for deep tumor imaging and phototherapy. **Nanomedicine**, 2015; 10, 1681-3. (PMID: 26080692)
25. Chakravarty R\*, **Goel S\***, Hong H, Chen F, Valdovinos HF, Hernandez R, Barnhart TE, Cai W. Hollow mesoporous silica nanoparticles for tumor vasculature targeting and PET image-guided drug delivery. **Nanomedicine**, 2015; 10, 1233-46. (PMID: 25955122)
26. **Goel S**, Chen F, Hong H, Valdovinos HF, Hernandez R, Shi S, Barnhart TE, Cai W. VEGF121-conjugated mesoporous silica nanoparticle: a tumor targeted drug delivery system. **ACS Applied Materials & Interfaces**, 2014; 6, 21677-85. (PMID: 25353068)
27. **Goel S**, Chen F, Ehlerding EB, Cai W. Intrinsically radiolabeled nanoparticles: an emerging paradigm. **Small**, 2014; 10, 3825-30. (PMID: 24978934) (*Selected as Frontispiece*)
28. **Goel S**, Chen F, Cai W. Synthesis and biomedical applications of copper sulfide nanoparticles: from sensors to theranostics. **Small**, 2014; 10, 631-45. (PMID: 24106015)

29. Chakravarty R\*, **Goel S\***, Valdovinos HF, Hernandez R, Hong H, Nickles RJ, Cai W. Matching the decay half-life with the biological half-life: ImmunoPET imaging with <sup>44</sup>Sc-labeled cetuximab Fab fragment. **Bioconjugate Chemistry**, 2014; 25, 2197-204. (PMID: 25389697)
30. Chakravarty R\*, **Goel S\***, Cai W. Nanobody: The “magic bullet” for molecular imaging? **Theranostics**, 2014; 4, 386-98. (PMID: 24578722)
31. Hong H, **Goel S**, Zhang Y, Cai W. Molecular imaging with nucleic acid aptamers. **Current Medicinal Chemistry**, 2011; 18, 4195-205. (PMID: 21838686)
32. Hong H, Yang K, Zhang Y, Engle JW, Feng L, Yang Y, Nayak TR, **Goel S**, Bean J, Theuer CP, Barnhart TE, Liu Z, Cai W. In vivo targeting and imaging of tumor vasculature with radiolabeled, antibody-conjugated nano-graphene. **ACS Nano**, 2012; 6, 2361–70. (PMID: 22339280 ) (**Highlighted in Chemical & Engineering News**)
33. Zhang Y, Hong H, Severin GW, Engle JW, Yang Y, **Goel S**, Nathanson AJ, Liu G, Nickles RJ, Leigh BR, Barnhart TE, Cai W. ImmunoPET and near-infrared fluorescence imaging of CD105 expression using a monoclonal antibody dual-labeled with <sup>89</sup>Zr and IRDye 800CW. **American Journal of Translational Research**, 2012; 4, 333-46. (PMID: 22937210)
34. Chen F, Nayak TR, **Goel S**, Valdovinos HF, Hong H, Theuer CP, Barnhart TE, Cai W. In vivo tumor vasculature targeted PET/NIRF imaging with TRC105(Fab)-conjugated, dual-labeled mesoporous silica nanoparticles. **Molecular Pharmaceutics**, 2014; 11, 4007-14. (PMID: 24937108)
35. Chen F, Hong H, Shi S, **Goel S**, Valdovinos HF, Hernandez R, Theuer CP, Barnhart TE, Cai W. Engineering of hollow mesoporous silica nanoparticles for remarkably enhanced tumor active targeting efficacy. **Scientific Reports**, 2014; 4, 5080. (PMID: 24875656)
36. Chen F, Hong H, **Goel S**, Graves SA, Orbay H, Ehlerding EB, Shi S, Theuer CP, Nickles RJ, Cai W. In vivo tumor vasculature targeting of CuS@MSN based theranostic nanomedicine. **ACS Nano**, 2015; 9, 3926-34. (PMID: 25843647)
37. Shi S, Yang K, Hong H, Chen F, Valdovinos HF, **Goel S**, Barnhart TE, Liu Z, Cai W. VEGFR targeting leads to significantly enhanced tumor uptake of nanographene oxide in vivo. **Biomaterials**, 2015; 39, 39-46. (PMID: 25477170)
38. Liu T, Shi S, Liang C, Shen S, Cheng L, Wang C, Song X, **Goel S**, Barnhart TE, Cai W, Liu Z. Iron oxide decorated MoS<sub>2</sub> nanosheets with double PEGylation for chelator-free radiolabeling and multimodal imaging guided photothermal therapy. **ACS Nano**, 2015; 9, 950-60. (PMID: 25562533)
39. Shi S, Orbay H, Yang Y, Graves SA, Nayak TR, Hong H, Hernandez R, Luo H, **Goel S**, Theuer CP, Nickles RJ, Cai W. PET imaging of abdominal aortic aneurysm with a <sup>64</sup>Cu-labeled antibody Fab fragment. **Journal of Nuclear Medicine**, 2015; 56, 927-32. (PMID: 25883125)
40. Shi S, Fliss BC, Gu Z, Zhu Y, Hong H, Valdovinos HF, Hernandez R, **Goel S**, Luo H, Chen F, Barnhart TE, Nickles RJ, Xu ZP, Cai W. Chelator-free labeling of layered double hydroxide nanoparticles for in vivo PET imaging. **Scientific Reports**, 2015; 5, 16930. (PMID: 26585551)
41. Zhang Y, Wang D, **Goel S**, Geng J, Sun H, Barnhart TE, Cai W, Xia J, Lovell JF. Surfactant-stripped Frozen Pheophytin Micelles for Multimodal Gut Imaging, **Advanced Materials**, 2016; 28, 8524-30. (PMID: 27396479)
42. Xu C, Shi S, Feng L, Chen F, Graves SA, **Goel S**, Ehlerding EB, Sun H, England CG, Nickles RJ, Liu Z, Wang T, Cai W. Long circulating reduced graphene oxide-iron oxide nanoparticles for efficient tumor targeting and multimodality imaging. **Nanoscale**, 2016; 8, 12683-92. (PMID: 27109431)
43. Cheng L, Kamkaew A, Shen S, Valdovinos HF, Sun H, Hernandez R, **Goel S**, Liu T, Thompson C, Barnhart TE, Cai W. Facile Preparation of Multifunctional WS<sub>2</sub>/WO<sub>x</sub> Nanodots for Chelator-Free <sup>89</sup>Zr-labeling and In Vivo PET Imaging. **Small**, 2016; 12, 5750-58. (PMID: 27593416)
44. Cheng L, Kamkaew A, Sun H, Jiang D, Valdovinos HF, Gong H, England CG, **Goel S**, Barnhart TE, Cai W. Dual-modality PET/Optical Image- Guided Photodynamic Cancer Therapy with PEG-Ce6 Nanomicelles. **ACS Nano**, 2016; 10, 7721-30. (PMID: 27459277)

45. Luo H, England CE, **Goel S**, Graves SA, Ai F, Liu B, Theuer CP, Wong HC, Nickles RJ, Cai W. ImmunoPET and near-infrared fluorescence imaging of pancreatic cancer with a dual-labeled bispecific antibody fragment. **Molecular Pharmaceutics**, 2017; 14, 1646-55. (PMID: 28292180)
46. Shi S, Xu C, Yang K, **Goel S**, Valdovinos HF, Luo H, Ehlerding EB, England CG, Cheng L, Chen F, Nickles RJ, Liu Z, Cai W. Chelator-Free Radiolabeling of Nanographene: Breaking the Stereotype of Chelation. **Angewandte Chemie**, 2017; 56, 2889-92. (PMID: 28170126) (*Highlighted by Phys.org, Nanotechnology Now and 9 other media outlets*)
47. Ellison PA, Chen F, **Goel S**, Barnhart TE, Nickles RJ, Onofre TD, Cai W. Intrinsic and Stable Conjugation of Thiolated Mesoporous Silica Nanoparticles with Radioarsenic. **ACS Applied Materials and Interfaces**, 2017; 9, 6772-81. (PMID: 28165700)
48. Chen F, Valdovinos HF, Hernandez R, **Goel S**, Barnhart TE, Cai W. Intrinsic radiolabeling of Titanium-45 using mesoporous silica nanoparticles. **Acta Pharmacologica Sinica**, 2017; 38,907-13. (PMID: 28414201)
49. Cheng L, Jiang D, Kamkaew A, Valdovinos HF, Im H-J, Feng L, England CG, **Goel S**, Barnhart TE, Liu Z, Cai W. Renal-clearable PEGylated porphyrin nanoparticles for image-guided photodynamic cancer therapy. **Advanced Functional Materials**, 2017; 27, 1702928. (PMID: 29151826)
50. Cheng L, Shen S, Jiang D, Jin Q, Ellison PA, Ehlerding EB, **Goel S**, Song G, Huang P, Barnhart TE, Liu Z, Cai W. Chelator-free labeling of metal oxide nanostructures with zirconium-89 for positron emission tomography imaging. **ACS Nano**, 2017; 11, 12193-201. (PMID: 29178789)
51. Zhan Y, Shi S, Ehlerding EB, Graves SA, **Goel S**, Engle JW, Liang J, Tian J, Cai W. Radiolabeled, antibody-conjugated manganese oxide nanoparticles for tumor vasculature targeted positron emission tomography and magnetic resonance imaging. **ACS Applied Materials & Interfaces**, 2017; 9, 38304-12. (PMID: 29028311)
52. Shi S, Chen F, **Goel S**, Graves SA, Luo H, Theuer CP, Engle JW, Cai W. In Vivo Tumor-Targeted Dual-Modality PET/Optical Imaging with a Yolk/Shell-Structured Silica Nanosystem. **Nano-micro Letters**, 2018; 10, 65. (PMID: 30393713)
53. Ehlerding EB, Lacognata S, Jiang D, Ferreira CA, **Goel S**, Hernandez R, Jeffery JJ, Theuer CP, Cai W. Targeting angiogenesis for radioimmunotherapy with a <sup>177</sup>Lu-labeled antibody. **European Journal of Nuclear Medicine and Molecular Imaging**, 2018; 45, 123-31. (PMID: 28821931)
54. Zhan Y, Ehlerding EB, Shi S, Graves SA, **Goel S**, Engle JW, Liang J, Cai W. Intrinsically Zirconium-89-Labeled Manganese Oxide Nanoparticles for In Vivo Dual-Modality Positron Emission Tomography and Magnetic Resonance Imaging. **Journal of Biomedical Nanotechnology**, 2018; 14,900-09. (PMID: 29883560)
55. Xu C, Chen F, Valdovinos HF, Jiang D, **Goel S**, Yu B, Sun H, Barnhart TE, Moon JJ, Cai W. Bacteria-like mesoporous silica-coated gold nanorods for positron emission tomography and photoacoustic imaging-guided chemo-photothermal combined therapy. **Biomaterials**, 2018; 165-56-65. (PMID: 29501970)
56. Ni D, Jiang D, Im HJ, Valdovinos HF, Yu B, **Goel S**, Barnhart TE, Huang P, Cai W. Radiolabeled polyoxometalate clusters: Kidney dysfunction evaluation and tumor diagnosis by positron emission tomography imaging. **Biomaterials**, 2018; 171,144-152. (PMID: 29689411)
57. Moukheiber D, Chitgupi U, Carter KA, Luo D, Sun B, **Goel S**, Ferreira CA, Engle JW, Wang D, Geng J, Zhang Y, Xia J, Cai W, Lovell JF. Surfactant-Stripped Pheophytin Micelles for Multimodal Tumor Imaging and Photodynamic Therapy. **ACS Applied BioMaterials**, 2018; 2, 544-54. (PMID: 31853516)
58. Liu T, Shi J, Duan L, Zhang Z, Luo L, **Goel S**, Cai W, Chen T. A highly hemocompatible erythrocyte membrane-coated ultrasmall selenium nanosystem for simultaneous cancer radiosensitization and precise antiangiogenesis. **Journal of Materials Chemistry B**, 2018; 6, 4756-64. (PMID: 30450208)
59. Li T, Shi S, **Goel S**, Shen X, Xie X, Chen Z, Zhang H, Li S, Qin X, Yang H, Wu C, Liu Y. Advancements in Mesoporous Silica Nanoparticles towards Therapeutic Applications for Cancer. **Acta Biomaterialia**, 2019; 89, 1-13. (PMID: 30797106)

60. Dogra P, Butner JD, Chuang Y, Caserta S, **Goel S**, Brinker CJ, Cristini V, Wang Z. Mathematical modeling in cancer nanomedicine: a review. **Biomedical Microdevices**, 2019; 21, 40. (PMID: 30949850)
61. Zhang Z, Ni D, Wang F, Yin X, **Goel S**, German LN, Wang Y, Li J, Cai W, Wang X. In vitro study of enhanced photodynamic cancer cell killing effect by nanometer-thick gold nanosheets. **Nano Research**, 2020; 13, 3217–23.
62. Dogra P, Butner JD, Nizzero S, Ramirez JR, Nouredine A, Pelaez MJ, Elganainy D, Yang Z, Le A-D, **Goel S**, Leong HS, Koay EJ, Brinker CJ, Cristini V, Wang Z. Image-guided mathematical modeling for pharmacological evaluation of nanomaterials and monoclonal antibodies. **WIREs Nanomedicine Nanobiotechnology**, 2020; 12, e1628.

### **Manuscripts in Preparation/Under Review**

63. **Goel S**, Kotrotsou A, de la Cerda J, Schuler F, Cardenas-Rodriguez J, Pagel MD. Multiparametric evaluation of early response to radiation therapy with quantitative multispectral optoacoustic tomography. (*In Preparation*)
64. **Goel S**, Zhang S, Kotrotsou A, de la Cerda J, Schuler F, Pagel MD. Comparison of quantitative dynamic contrast enhancement (DCE) imaging methods for evaluation of early response to anti-vascular drug treatments. (*In Preparation*)

### **Book Chapters (\*: Equal Contribution; †: Corresponding Author)**

1. Hong H, **Goel S**, Cai W. In vivo imaging of protein-protein interactions (Chapter 15). In Protein-Protein Interactions: Computational and Experimental Tools, edited by Weibo Cai and Hao Hong. InTech - Open Access Publisher, 2012, 287-304.
2. Yang SP, **Goel S**, Cai W. In vivo molecular imaging with quantum dots. In Biological and Pharmaceutical Applications of Nanomaterials, edited by Polina Prokopovich. CRC Press, 2015, 319–346.
3. **Goel S**, Chen F, Cai W. Red Blood Cell-Mimicking Hybrid Nanoparticles. In Hybrid Nanomaterials: Design, Synthesis, and Biomedical Applications, edited by Weibo Cai and Feng Chen. CRC Press, 2016.
4. Shi S, Chen F, **Goel S**, Cai W. Epitaxial Growth of Heterostructured Nanoparticles for Biomedical Applications. In Hybrid Nanomaterials: Design, Synthesis, and Biomedical Applications, edited by Weibo Cai and Feng Chen. CRC Press, 2016.
5. Ferreira CA, **Goel S**<sup>†</sup>, Cai W<sup>†</sup>. Exogenous Radionanomedicine: Inorganic Nanomaterials. In Radionanomedicine – Combined Nuclear and Nanomedicine, edited by Dong Soo Lee, Springer International Publishing AG, 2017.

## **PRESENTATIONS**

### **Invited Talks**

- **Materials Research Seminar (MSAE 900)**, Materials Science Program, University of Wisconsin-Madison.
- **WIMR II Medical Imaging Artwork Award Presentations and Reception**, Departments of Radiology and Medical Physics, University of Wisconsin-Madison.
- **Goel S**, Chakravarty R, Valdovinos HF, Hernandez R, Nickles RJ, Cai W. Matching the Decay  $t_{1/2}$  with Biological  $t_{1/2}$ : PET Imaging with  $^{44}\text{Sc}$ -labeled Cetuximab Fab. **Midwest Preclinical Imaging Consortium**, University of Wisconsin – Madison, May 2016.
- **Houston Methodist Research Institute**, December 7, 2016. (Invited by Dr. Mauro Ferrari)
- **Xidian University, Xia'an China**, April 2, 2018. (Invited by Dr. Yonghua Zhan)

- **MD Anderson Cancer Center**, Integrating Positron Emission Tomography and Nanomedicine, August 16, 2019.
- **Houston Methodist Research Institute**, November 4, 2020. (Invited by Dr. Francesca Taraballi)
- **City University of Hong Kong, Department of Biomedical Engineering**, December 14, 2020 (Invited by Dr. Dong Sun)
- **University of Utah, Department of Pharmaceutics and Pharmaceutical Chemistry**, February 11, 2021 (Invited by Dr. Hamid Ghandehari).

### Selected Conference Presentations (Total > 35)

1. **Goel S**, Chen F, Hong H, Valdovinos HF, Barnhart TE, Cai W. VEGFR-targeted drug delivery in vivo with mesoporous silica nanoparticles. Society of Nuclear Medicine and Molecular Imaging 2014 Annual Meeting, ST. Louis, Missouri, June 2014 (#222 Oral Presentation).
2. Chen F, Hong H, **Goel S**, Valdovinos HF, Nickles RJ, Cai W. A multifunctional CuS@MSN nanoplatform for tumor targeted PET imaging, drug delivery, and photothermal therapy. Society of Nuclear Medicine and Molecular Imaging 2014 Annual Meeting, ST. Louis, Missouri, June 2014 (**#168, Highlighted Oral Presentation**).
3. Graves SA, **Goel S**, Chen F, Valdovinos HF, Barnhart TE, Cai W, Nickles RJ. Production and novel radiochemical separation of <sup>194</sup>Au from Pt for use in multi-modality nanoparticles. 15<sup>th</sup> International Workshop on Targetry and Target Chemistry, August 2014 (#PS217).
4. Chen, F, **Goel, S**, Nayak TR, Valdovinos HF, Barnhart TE, Cai W. Surface Engineering of Mesoporous Silica Nanoparticles for In Vivo Tumor Targeted Drug Delivery and PET/NIRF Dual-Modality Imaging. 27<sup>th</sup> Annual Congress of the European Association of Nuclear Medicine, Gothenburg, Sweden, October 2014.
5. Chen F, Hong H, **Goel S**, Graves SA, Barnhart TE, Cai W. Generalized Syntheses of Tumor Targeted Yolk/Shell Structured Multifunctional Nanosystems. 28<sup>th</sup> Annual Congress of the European Association of Nuclear Medicine, Hamburg, Germany, October 2014.
6. Hong H, Chen F, **Goel S**, Valdovinos HF, Barnhart TE, Cai W. Multifunctional CuS@MSN Core-Shell Nanocomposites for Tumor Targeted PET Imaging and Photothermal Therapy. 27<sup>th</sup> Annual Congress of the European Association of Nuclear Medicine, Gothenburg, Sweden, October 2014.
7. Shi S, Chen F, **Goel S**, Graves SA, Nickles RJ, Cai W. In vivo tumor targeting and dual-modality PET/optical imaging with a yolk/shell structured nanosystem. The ASME 2015 4<sup>th</sup> Global Congress on NanoEngineering for Medicine and Biology, Minneapolis, Minnesota, April 2015 (# 8054).
8. **Goel S**, Chakravarty R, Valdovinos HF, Hernandez R, Nickles RJ, Cai W. Matching the decay t<sub>1/2</sub> with biological t<sub>1/2</sub>: PET imaging with <sup>44</sup>Sc-labeled cetuximab Fab. Society of Nuclear Medicine and Molecular Imaging 2014 Annual Meeting, Baltimore, Maryland June 2015 (#P1041)
9. **Goel S**, Chakravarty R, Hong H, Valdovinos HF, Barnhart TE, Cai W. Multifunctional hollow mesoporous silica nanoparticles for tumor targeted, PET image-guided drug delivery. Society of Nuclear Medicine and Molecular Imaging 2014 Annual Meeting, Baltimore, Maryland June 2015 (#P1108)
10. Shi S, Chen F, **Goel S**, Graves SA, Nickles RJ, Cai W. In vivo tumor targeting and dual-modality PET/optical imaging with a yolk/shell structured nanosystem. Society of Nuclear Medicine and Molecular Imaging 2015 Annual Meeting, Baltimore, Maryland, June 2015 (Oral Presentation).
11. Chen F, Hong H, **Goel S**, Graves SA, Barnhart TE, Cai W. Generalized syntheses of tumor targeted yolk/shell structured multifunctional nanosystems. Society of Nuclear Medicine and Molecular Imaging 2015 Annual Meeting, Baltimore, Maryland, June 2015 (Oral Presentation).
12. Chen F, **Goel S**, Valdovinos HF, Shi S, Barnhart TE, Cai W. Chelator-free <sup>89</sup>Zr-labeling of mesoporous silica nanoparticles with superb in vivo radiostability. Society of Nuclear Medicine and Molecular Imaging 2015 Annual Meeting, Baltimore, Maryland, June 2015 (Oral Presentation).



13. Shi S, Chen F, Graves SA, **Goel S**, Barnhart TE, Cai W. Generalized syntheses of tumor targeted yolk/shell structured multifunctional nanosystems. The ASME 2016 5th Global Congress on NanoEngineering for Medicine and Biology, Houston, Texas, February 2016 (**1<sup>st</sup> Place, Poster Award**).
14. Valdovinos HF, Hernandez R, **Goel S**, Graves SA, Barnhart TE, Cai W, Nickles RJ. Auger electron-based targeted radioimmunotherapy with <sup>58</sup>mCo, a feasibility study. 14<sup>th</sup> Mexican Symposium on Medical Physics, Mexico City, March 2016.
15. **Goel S**, Ai F, Zhan Y, Chen F, Barnhart TE, Cai W. Chelator-free <sup>89</sup>Zr-labeling of Gd<sub>2</sub>O<sub>2</sub>S:Eu nanoparticles for multimodal in vivo imaging. Society of Nuclear Medicine and Molecular Imaging 2016 Annual Meeting, San Diego, California, June 2016. (Oral Presentation)
16. **Goel S**, Chen F, Shi S, Valdovinos HF, Barnhart TE, Cai W. Engineering of Intrinsically Zirconium-89 Radiolabeled Self-Destructing Mesoporous Silica Nanostructures for In Vivo Tumor Vasculature Targeting. World Molecular Imaging Congress 2016, New York, September 2016. (Oral Presentation)
17. **Goel S**, Chen F, Hernandez R, Graves SA, Nickles RJ, Cai W. Dynamic PET Imaging of Renal Clearable Gold Nanoparticles. World Molecular Imaging Congress 2016, New York, September 2016. (**# P526, 1<sup>st</sup> Place, Poster Award**)
18. Cai W, **Goel S**, Chen F, Shi S, Valdovinos HF, Barnhart TE. Intrinsically <sup>89</sup>Zr-Labeled Self-Destructing Mesoporous Silica Nanostructures for In Vivo Tumor Vasculature Targeting. European Association of Nuclear Medicine 2016, Barcelona, October 2016. (# OP402, Oral Presentation).
19. **Goel S**, Chen F, Hernandez R, Graves SA, Nickles RJ, Cai W. Dynamic PET Imaging of Renal Clearable Gold Nanoparticles. Radiological Society of North America Annual Meeting 2016, Chicago, Illinois, December 2016. (Oral Presentation)
20. **Goel S**, Chen F, Valdovinos HF, Barnhart TE, Cai W. Versatile core-satellite nanotheranostics to seek and treat tumors in vivo. Society of Nuclear Medicine and Molecular Imaging 2017 Annual Meeting, Denver, Colorado, June 2017. (Oral Presentation)
21. **Goel S**, Yu B, Jiang D, Barnhart TE, Cai W. Radiolabeled ultrasmall mesoporous silica nanotracers for enhanced tumor accumulation and rapid clearance. Society of Nuclear Medicine and Molecular Imaging 2017 Annual Meeting, Denver, Colorado, June 2017.
22. Cai W, **Goel S**, Barnhart TE. Core-Satellite Nanomaterials for Multimodal Image-Guided Combination Cancer Therapy. European Association of Nuclear Medicine 2017, Vienna, October 2017.
23. Ferreira CA, **Goel S**, Yu B, Barnhart TE, Cai W. Vasculature-based differential tumor uptake of radiolabeled Ultrasmall Mesoporous Silica Nanoparticles in breast cancers models. Society of Nuclear Medicine and Molecular Imaging Annual Meeting, Philadelphia, 2018. Center for Molecular Imaging Innovation & Translation (CMIIT) Young Investigator Award Symposium. (**3rd Place**)
24. **Goel S**, de la Cerda J, Schuler W, Kotrotsou A, Cardenas-rodriguez J, Pagel MD. Improving Evaluations of Radiation Therapy with Dynamic Contrast Enhanced Multispectral Optoacoustic tomography (DCE-MSOT). European Molecular Imaging Meeting, Thessaloniki, Greece, August 2020 (Oral Presentation)
25. Liu YT\*, **Goel S\***, Kai M, Nguyen T, Yokoi K. Heterogeneous tumor microenvironment in metastatic breast cancer for insufficient anti-PDL1 IgG delivery and its efficacy. 2020 PS-ON Annual Investigators Meeting, September 2020.

## **ACADEMIC SERVICE**

- **Sung Wan Kim Endowed Chair in Drug and Gene Delivery Search Committee Member**  
Department of Pharmaceutics and Pharmaceutical Chemistry, University of Utah
- **Grant Review**  
ITMO Cancer - French Alliance for Life Sciences and Health/French National Cancer Institute
- **Sub-Chair**  
EMIM Annual Meeting 2021, Oncology: Imaging in Cancer Therapy

- **Guest Editor, Special Research Topics**  
Frontiers in Chemistry
- **Scientific Program Manager and Academic Liaison**  
Molecular Imaging Society of India
- **Co-Chair**  
EMIM Annual Meeting 2020, Imaging in Cancer Therapy Poster Walk
- **Committee Sub-Chair**  
WMIS Annual Meeting 2020, New Probes and Targets Category
- **Conference Abstract Review**  
WMIS Annual Meeting 2020-2021  
EMIM 2020-2021  
SNMMI Annual Meeting 2018-2020
- **Poster Judge**  
Smalley-Curl Institute Transdisciplinary Symposium, Rice University, 2020
- **Mentor**  
Undergraduate Research Scholar Program, University of Wisconsin-Madison, 2016-2017

**Selected Journal Reviews (Reviewer)**

ACS Applied Materials & Interfaces	Molecular Imaging and Biology
ACS Nano	International Journal of Pharmaceutics
Acta Biomaterialia	Journal of Materials Chemistry B
Advanced Drug Delivery Reviews	Journal of Clinical Medicine
Advanced Healthcare Materials	Scientific Reports
Amino Acids	Nanomedicine: Nanotechnology, Biology, and Medicine
Applied Nanoscience	Nanoscale
Bioconjugate Chemistry	Oncotarget
Cancers	Radiology
Chemical Communications	Radiology: Imaging Cancer
European Journal of Nuclear Medicine and Molecular Imaging Research	RSC Advances

**Selected Journal Reviews (Co-Reviewer)**

ACS Applied Materials & Interfaces	Journal of Materials Chemistry B
Advanced Drug Delivery Reviews	Molecular Pharmaceutics
Advanced Functional Materials	Nanomedicine: NMB
Advanced Materials	Nanoscale
ACS Nano	Oncotarget
Biomaterials	Scientific Reports
Current Drug Targets	Small
Industrial & Engineering Chemistry Research	Theranostics
Journal of American Chemical Society	

**PROFESSIONAL AFFILIATIONS**

Society of Nuclear Medicine and Molecular Imaging (SNMMI)	Present
World Molecular Imaging Society (WMIS)	Present

*Curriculum Vitae*

**Shreya Goel, Ph.D.**

American Association of Cancer Research (AACR) Associate Member	Present
AACR Pediatric Working Group	Present
Molecular Imaging Society of India (MISI)	Present
European Society for Molecular Imaging (ESMI)	2019-2020
WMIS Early Professionals in Molecular Imaging Interest Group	2019-2020
Radiological Society of North America (RSNA)	2016- 2018