University of Pittsburgh

School of Medicine

CURRICULUM VITAE FORMAT

BIOGRAPHICAL

Name: Ravi Bhasker Patel

Home Address: 3934 Foster St. B-301, Pittsburgh, PA 15201
Home Phone: 216-269-1971
Email: rbp27@pitt.edu

Business Address: 5051 Centre Ave, 5077, Pittsburgh, PA 15213
Business Phone: 412-709-8830

EDUCATION and TRAINING

UNDERGRADUATE

9/1999 – 5/2003	CWRU, Cleveland, OH	BSE - 2003	Biomedical Engineering

GRADUATE

6/2003-5/2012	CWRU, Cleveland, OH	MS – 2008 PhD – 2011 MD - 2012	Biomedical Engineering Medicine

POSTGRADUATE

6/2012-6/2013	Akron General Medical Center, Akron, OH	Preliminary Medicine Certificate – 2013, Program Director – Titus Sheers	Medicine
7/2013-6/2017	University Hospitals of Cleveland Medical Center, Cleveland, OH.	Residency – 2017, Program Director – Mitchell Machtay	Radiation Oncology
7/2017-2/28/2020	University of Wisconsin, Madison, WI	Benston Translational Research Fellowship 2/2020. Program Director – Zachary Morris	Research Fellowship, Radiation Oncology

APPOINTMENTS and POSITIONS

ACADEMIC

2015-2021	CWRU, Cleveland, OH	Adjunct Instructor, Department of Biomedical Engineering
2020-present	University of Pittsburgh, Pittsburgh, PA	Assistant Professor, Department of Radiation Oncology
2020-Present	University of Pittsburgh, Pittsburgh, PA	Assistant Professor, Department of Bioengineering (Secondary Appointment)
2024-Present	University of Pittsburgh, Pittsburgh, PA	Director of Radiopharmaceuticals in Radiation Oncology

NON-ACADEMIC

2019-present	UPMC, Pittsburgh, PA	Physician, Radiation Oncologist

CERTIFICATION and LICENSURE

SPECIALTY CERTIFICATION:

American Board of Radiology - Radiation Oncology	2018

MEDICAL or OTHER PROFESSIONAL LICENSURE:

Wisconsin Medical Board	2017
Pennsylvania Medical Board	2019

MEMBERSHIP in PROFESSIONAL and SCIENTIFIC SOCIETIES

American Board of Radiology	2013
American Association of Cancer Research	2013

American Society of Radiation Oncology	2013
Radiological Society of North America	2013
American Brachytherapy Society	2016
American College of Radiology	2016
American Society of Clinical Oncology (ASCO)	2016
Society of Immunotherapy in Cancer (SITC)	2017
Radiation Research Society (RRS)	2018

HONORS

CWRU President's Scholarship	1999
NSF REU Fellowship	2003
CWRU Biomedical Engineering Research Award	2003
Northeast Ohio Medical College Oral Paper Presentation Award	2013
ABS HDR Brachytherapy Scholarship	2016
AACR Molecular Biology in Clinical Oncology Workshop	2016
RSNA Research Fellow Grant Award	2017
RSNA Roentgen Resident Research Award	2017
RRS Scholar in Training Travel Award	2018
Immuno-Oncology Young Investigator's Forum Clinical Fellow Award	2018
ASCO YIA	2018
SITC Sparkathon Team	2018
SITC Young Investigator Abstract Travel Award	2018
SITC Winter School Travel Award	2019
RRS Scholar in Training Travel Award	2019
Hillman Early Career Fellow for Innovative Cancer Research	2020
ECOG-ACRIN Young Investigator Forum, Translational Science Award	2020
Hillman Clinical Translational Junior Scholar Award	2021
Radiation Research Society ECI Travel Award	2022
Bothwell Award for Team Science Paper of the Year	2022
Forbeck Scholar Selection	2023
Hillman Emerging Research Scholar Award	2024

PUBLICATIONS

1. ORIGINAL PEER REVIEWED ARTICLES

Weinberg BD, **Patel RB**, Exner AA, Saidel GM, Gao J. 2007. Modeling doxorubicin transport to improve intratumoral drug delivery to RF ablated tumors. J Control Release. 2007 Dec 4;124(1-2):11-9. PMID: 17900740
Role – I designed the mathematical model, performed data analysis, edited the paper.

Weinberg BD, **Patel RB**, Exner AA, Wu H, Blanco E, Barnett CC, Saidel GM, and Gao J. Model Simulation and Experimental Validation of Intratumoral Chemotherapy Using Multiple Polymer Implants. Med Biol Eng Comput, 2008; 46(10):1039-49. PMID: 18523817
Role – I performed the finite element modeling analysis, performed data analysis, edited the paper.

Wu H, Exner AA, Krupka TM, Weinberg BD, **Patel R**, Haaga JR. Radiofrequency Ablation: Post-ablation Assessment Using CT Perfusion with Pharmacological Modulation in a Rat Subcutaneous Tumor Model. Acad Radiol. 2009; 16(3): 321-31. PMID: 19201361
Role – I developed and performed the quantitative image analysis of CT perfusion over time.

Solorio, L., Babin, B.M., **Patel, R.B**., Mach, J., Exner, AA. Noninvasive Characterization of In situ Forming Implants Using Diagnostic Ultrasound. J Control Release 2010; 143(2): 183-90. PMID: 20060859
Role – I performed animal studies and helped with experimental design and data analysis.

Patel, R.B., Carlson, A., Solorio, L., Exner, AA. Characterization of formulation parameters affecting low molecular weight drug release from in situ forming drug delivery systems. J Biomed Mater Res A 2010 Aug; 94(2):476-84. PMID: 20186771
Role – Solo lead author who led, designed, and performed all studies and drafted the manuscript.

Patel, RB, Solorio, L., Wu, H, Krupka, TM, Exner, AA. Effect of injection site on in situ implant formation and drug release in vivo. J Control Release 2010 Nov 1; 147(3):350-8. PMID: 20728486
Role – Solo lead author who led, designed, and performed all studies and drafted the manuscript.

H. Wu, **R. Patel**, L. Solorio, T.M. Krupka, Exner, AA., Haaga, J. Differentiation of benign periablational enhancement from residual tumor with contrast-enhanced ultrasonography following radiofrequency ablation in an experimental rodent model of colorectal cancer. J Vasc Interv Radiol 2011; 22(3)
Role – I developed and performed the quantitative image analysis of US perfusion over time

Wu, H, **Patel, RB**, Zheng, Y, Solorio, L, Krupka, TM, Ziats, NP, Haaga, JR, Exner, AA. Differentiation of benign periablational enhancement from residual tumor following radio-

frequency ablation using contrast-enhanced ultrasonography in a rat subcutaneous colon cancer model. Ultrasound Med Biol 2012 Mar;38(3):443-53. PMID: 22266229
Role – I developed and performed the quantitative image analysis of US perfusion over time

Solorio, L, Olear, AM, Hamilton, JI, **Patel, RB**, Beiswenger, AC, Wallace, JE, Zhou, H, Exner, AA. Noninvasive characterization of the effect of varying PLGA molecular weight blends on in situ forming implant behavior using ultrasound imaging. Theranostics 2012;2(11):1064-77. PMID: 23227123
Role – I performed animal studies and helped with experimental design and data analysis.

Perera, RH, **Patel, R**, Wu, H, Gangolli, M, Traughber, B, Oleinick, N, Exner, AA. Preclinical evaluation of radiosensitizing activity of Pluronic block copolymers. Int J Radiat Biol 2013 Oct; 89(10):801-12. PMID: 23631609
Role – I performed animal studies as well as all clonogenic survival assays and helped with experimental design and data analysis.

Okoye, CC, **Patel, RB**, Hasan, S, Podder, T, Khouri, A, Fabien, J, Zhang, Y, Dobbins, D, Sohn, JW, Yuan, J, Yao, M, Machtay, M, Sloan, AE, Miller, J, Lo, SS. Comparison of Ray Tracing and Monte Carlo Calculation Algorithms for Thoracic Spine Lesions Treated with Cyberknife-Based Stereotactic Body Radiation Therapy. Technol Cancer Res Treat 2016 Feb;15(1):196- 202: PMID: 25633137
Role – I performed data analysis and helped draft and edit the paper

Ponsky, L, Lo, SS, Zhang, Y, Schluchter, M, Yiying, L, **Patel, RB**, Abouassaly, R, Welford, S, Gulani, V, Haaga, JR, Machtay, M, Ellis, RJ. Phase I dose-escalation study of stereotactic body radiotherapy (SBRT) for poor surgical candidates with localized renal cell carcinoma. Radiother Oncol 2015 Oct; 117(1):183-7. PMID: 26362723
Role – I put together the initial database, performed the initial trial analysis, and helped edit the paper.

Oleinick, N.L., T. Biswas, R.K. Patel, M.F. Tao, **Patel, RB**, Weeks, L, Sharma, N, Dowlati, A, Gerson, SL, Fu, P, Zhang, J, Machtay. M. Radiosensitization of non-small-cell lung cancer cells and xenografts by the interactive effects of pemetrexed and methoxyamine. Radiother Oncol 2016 Nov; 121(2). PMID: 27838149
Role – I performed DNA Damage Assays and edited the paper.

Franke, C, Czapar, A, **Patel, RB**, Steinmetz, N. Tobacco mosaic virus-delivered cisplatin restores efficacy in platinum- resistant ovarian cancer cells. Molecular Pharmaceutics 2017 Sept. PMID: 28926265
Role – I designed and performed DNA Damage Assays and wrote sections of the paper.

Werner, L, Kler, J, Gresset, MM, Riegert, M, Werner, LK, Heinze, CM, Kern, JG, Abbariki, M, Erbe, A, **Patel, RB**, Sriramaneni, RN, Harari, PM, Morris, ZS. Transcriptional-mediated effects of radiation on the expression of immune susceptibility markers in melanoma. Radiother Oncol. 2017 Sep 8. pii: S0167-8140(17)32526-4. PMID: 28893414

Role – I performed flow cytometry studies and helped write sections of the paper.

Patel, RB, Czapar, AE, Fiering, S, Oleinick, NL, Steinmetz, NF. Radiation therapy combined with cowpea mosaic virus nanoparticle in situ vaccination initiates immune-mediated tumor regression. ACS Omega 2018 Apr 30;3(4):3702-3707. PMID: 29732445

Hernandez, R, Walker, KL, Grudzinski, JJ, Aluicio-Sarduy, E, **Patel, RB**, Zahm, CD, Pinchuk, AN, Massey, CF, Bitton, AN, Brown, RJ, Sondel, PM, Morris, ZS, Engle, JW, Capitini, CM, Weichert, JP. 90Y-NM600 TRT achieves complete responses associated with immunologic memory in syngeneic models of T-cell NHL. Commun Biol. 2019 Feb 26;2(79) – PMID: 30820474
Role – I helped prepare animal tumors, performed histology, and edit the paper.

Grudinski, JJ, Hernandez, R, Marsh, I, **Patel, RB**, Aluicio-Sarduy, E, Engle, J, Morris, ZS, Bednarz, B, Wiechert, J. Preclinical characterization of 86/90Y-NM600, a new tumor-targeting APC-chelate, in a variety of murine and human cancer tumor models. JNM. 2019 Apr 6 – PMID: 30954941
Role – I helped perform imaging experiments, led animal studies, and wrote sections of the paper/figures.

Patel, RB, Ye, M, Carlson, P, Jacquish, A, Zangl, L, Ma, B Wang, Y, Arthur, I, Xie, R, Brown, R, Wang, X, Sriramaneni, R, Kim, K, Gong, S, Morris, ZS. An in situ cancer vaccine via combinational radiation therapy and bacterial membrane coated nanoparticles. Adv Mater. 2019 Sept 16 – PMID: 31523868

Voeller, J, Erbe, A, Slowinski, J, Rasmussen, K, Carlson, P, Hoefges, A, VandenHeuvel, S, Stuckwisch, A, Wang, Xing, Gillies, SD, **Patel, RB**, Farrel, A, Maris, J, Hank, JA, Morris, ZS, Rakhmilevich, A., Sondel, PM. Combined Innate and Adaptive Immunotherapy Overcomes Resistance of Immunologically Cold Syngeneic Murine Neuroblastoma to Checkpoint Inhibition. JITC. 2019 Dec 6;7(1):344 – PMID: 31810498
Role – I helped perform animal experiments, analyze data, and edit the paper.

Hernandez R, Grudzinski JJ, Aluicio-Sarduy E, Bitton AM, Massey CF, Pinchuk AN, **Patel RB**, Zhang RR, Iyer G, Engle JW, Weichert JP. 177Lu-NM600 targeted radionuclide therapy extends survival in syngeneic murine models of breast cancer. J Nucl Med. 2019. PMID – 31862799.
Role – I helped prepare animal tumors, performed histology, and edit the paper.

Baniel CC, Heinze CM, Hoefges A, Sumiec EG, Hank JA, Carlson PM, Jin WJ, **Patel RB**, Sriramaneni R, Gillies SD, Erbe AK, Schwarz CN, Pieper AA, Rakhmilevich AL, Sondel PM, Morris ZS. In situ vaccine plus checkpoint blockade induces memory humoral response. Frontiers Immunol 2020 Jul 24;11:1610. PMID: 32849544
Role – I helped design experiments, perform data analysis, edit the paper.

Baniel CC, Sumiec EG, Hank JA, Bates AM, Erbe AK, Pieper AA, Hoefges A, **Patel RB**, Rakhmilevich AL, Morris ZS, Sondel PM. Intratumoral injection reduces toxicity and antibody

mediated neutralization of immunocytokine in a mouse melanoma model. J Immunother Cancer. 2020 Oct;8(2). PMID: 33115944.
Role – I helped design experiments, perform data analysis, edit the paper.

Carlson PM, Mohan M, Rodriquez M, Subbotin V, Sun C, **Patel RB**, Birstler J, Hank JA, Rakhmilevich AL, Morris ZS, Erbe AK, Sondel PM. Depth of tumor implantation affects response to in situ vaccination in a syngeneic murine melanoma model. JITC 2021 Apr;9(4). PMID: 33858849
Role – I helped design experiments, perform data analysis, edit the paper.

Patel, RB, Hernandez, R, Carlson, PM, Grudinski, J, Bates, AM, Jagodinsky, JC, Erbe, A, Marsh, IR, Alucio-Sarduy, E, Rakhmilevich, AL, Vail, D, Engle, JW, Le, T, Kim, KyungMann, Bednarz, B, Sondel, PM, Weichert, JP, Morris, ZS. Low-dose targeted radionuclide therapy renders immunologically "cold" tumor responsive to immune checkpoint blockade. Science Trans Med. 2021 Jul 14;12(602). PMID: 34261797

Bates AM*, Brown RJ*, Pieper AA, Zangl LM, Arthur I, Carlson PM, Le T, Sosa GA, Clark PA, Sriramaneni RN, Kim K, **Patel RB****, Morris ZS**. Combination of bempegaldesleukin and anti-CTLA4 prevent metastatic dissemination after primary resection or radiotherapy in a preclinical model of non-small cell lung cancer. Front Onc. 2021;11645352. PMID: 33937052, **contributed equally, **co-senior, corresponding authors*

Jagodinsky JC*, Jin WJ*, Bates AM, Hernandez R, Grudinski JJ, Marsh IR, Chakravarty I, Arthur IS, Zangl L, Brown RJ, Nystuen EJ, Emma SE, Kerr C, Carlson PM, Sriramaneni RN, Engle JW, Alucio-Sarduy E, Barnhart TE, Le T, Kim K, Bednarz BP, Weichert JP, **Patel RB****, Morris ZS**. Temporal analysis of Type 1 interferon activation in tumor cells follow external beam radiotherapy or targeted radionuclide therapy. Theranostics 2021 Apr 15;11(13):6120-6137. PMID: 33995649.
**contributed equally, **co-senior authors*

Pieper AA, Rakhmilevich AL, Spiegelman D, **Patel RB**, Birstler J, Jin W, Carlson PM, Charych DH, Hank JA, Erbe AK, Owerwijk WW, Morris ZS, Sondel PM. Combination of radiation therapy, bempegaldesleukin, and checkpoint blockade eradicates advanced solid tumors and metastases in mice. J Immunother Cancer 2021 Jun; 9(6) PMID: 34172518
Role – I helped design experiments, perform data analysis, edit the paper.

Carlson PM, Mohan M, **Patel RB**, Birstler J, Nettenstrom L, Sheerar D, Fox K, Rodriguez M, Hoefges A, Hernandez R, Zahm C, Kim K, McNeel D, Weichert J, Morris ZS, Sondel PM. Optimizing flow cytometric analysis of immune cells in samples requiring cryopreservation from tumor bearing mice. J Immunol. 2021 Jul 14. PMID: 34261667
Role – I helped design experiments, perform data analysis, edit the paper.

Bellavia MC*, Nyiranshuti L*, Latoche JD, Fecek RJ, Taylor JL, Day KE, Nigam S, Gallazzi F, Storkus WJ, **Patel RB****,

Anderson CJ**. PET Imaging of VLA-4 in a New BRAFV600E Mouse Model of Melanoma. Mol Imaging and Biol. 2021 Oct 25. PMID: 34694528. *contributed equally, ***co-senior , corresponding authors***

Pieper AA*, Zangl LM*, Speigelman DV, Fiels AS, Hoegfes A, Jagodinsky JC, Felder MA, Tsarovsky NW, Arthur IS, Brown RJ, Birstler J, Le T, Carlson PM, Bates AM, Hank JA, Rakhmilevich AL, Erbe AK, Sondel PM**, **Patel RB****, Morris ZS**. Local Radiation Augments the Anti-Tumor Effect of In Situ Vaccine with CpG-Oligodeoxynucleotides and Anti-OX40 in Immunologically Cold Tumor Models. Front Immunol. 2021 Nov 15. PMID: 34868010. *contributed equally, ***co-senior authors***

Hamade DF, Espinal A, Yu J, Leibowitz BJ, Fisher R, Hou W, Shields D, van Pijkeren JP, Mukherjee A, Epperly MW, Vlad A, Coffman L, Wang H, Huq MS, **Patel RB**, Huang J, Greenberger JS. Lactobacillus reuteri Releasing IL-22 (LR-IL-22) Facilitates Intestinal Radioprotection for Whole Abdomen Irradiation (WAI) of Ovarian Cancer. Rad Res. 2022 Apr 21. PMID: 35446961
Role – I helped design experiments, perform data analysis, edit the paper.

Espinal A, Epperly MW, Mukhergee A, Fisher R, Shields D, Wang H, Saiful Huq M, Hamade DF, Vlad AM, Coffman I, Buckanovich R, Yu J, Leibowitz BJ, Van Pijkeren JP, **Patel RB**, Stolz D, Watkins S, Ejaz A, Greenberger JS. Intestinal Radiation Protection and Mitigation by Second-Generation Probiotic Lactobacillus-Reuteri Engineered to Deliver Interleukin-22. IJMS. 2022 May 17. PMID: 35628427
Role – I helped design experiments, analyzed flow cytometry data, and edited the paper.

Carlson PM, **Patel RB**, Birstler J, Rodriquez M, Sun C, Erbe AK, Bates AM, Marsh I, Grudzinski J, Hernandex R, Pieper AA, Feils AS, Rakhmilevich AL, Weichert JP, Bednarz BP, Sondel PM, Morris ZS. Radiation to all macroscopic sites of tumor permits greater systemic antitumor response to in situ vaccination. JITC. 2023 Jan;11(1). PMID: 36639155
Role – I helped design experiments, perform data analysis, edit the paper.

Vincze SR, Jaswal AP, Frederico SC, Misnboym M, Li B, Xiong Z, Sever RE, Sneiderman CT, Rodgers M, Day KE, LaToche JD, Foley LM, Hitchens TK, Frederick R, **Patel RB**, Hadjipanayis CG, Raphael I, Nedrow JR, Edwards WB, Kohanbash G. ImmunoPET imaging of TIGIT in the glioma microenvironment. Sci Rep. 2024 Mar 4;14(1). PMID: 38438420
Role – I helped write and edit the paper.

Abdelhakiem MK, Bao R, Pifer PM, Molkentine D, Molkentine J, Hefner A, Beadle B, Heymach JV, Luke JJ, Ferris RL, Pickering CR, Wang JH, **Patel RB***, Skinner HD*. Th2 Cells Are Associated with Tumor Recurrence Following Radiation. Cancers. 2024 Apr 20;16(8). PMID: 38672668. *Co-last authors
Role – I helped design and run data analysis and helped co-write and edit the paper.

2. OTHER PEER REVIEWED PUBLICATIONS

Solorio*, L., **Patel*, RB**., Wu, H., Krupka, T., Exner, AA. Advances in image-guided intratumoral drug delivery techniques. Therapeutic Delivery 2010; 1(2): 307-22. PMID: 22816134 *Co-primary authors

Okoye CC, **Patel RB**, Siva S, Louie AV, Lo SS. Stereotactic body radiotherapy for oligometastatic renal cell carcinoma—are we ready to roll? Ann Transl Med 2019;7(Suppl 6):S180. PMID: 31656759
Role – I co-wrote the paper.

Hwang, L, Okoye, CC, **Patel, RB**, Sahgal, A, Foote, M, Redmond, KJ, Hofstetter, C, Saigal, R, Mossa-Basha, M, Yuh, W, Mayr, NA, Chao, ST, Chang, EL, Lo, SS. Stereotactic Body Radiotherapy for Benign Spinal Tumors. J of Radiosurgery and SBRT 2019 6 (3), 167-177.
Role – I helped to write and edit the paper.

Okoye, CC, **Patel, RB**, Sahgal, A, Chang, E, Lo, SS. Commentary: Long-term Update of Stereotactic Radiosurgery for Benign Spinal Tumors – Neurosurgery October 2018 [Epub ahead of print] – PMID: 30295823
Role – I helped to write and edit the paper.

Patel, RB, Baniel, CC, Sriramaneni, RN, Bradley, K, Markovina, S, Morris, ZS. Combining Brachytherapy and Immunotherapy to Achieve in Situ Tumor Vaccination: A Review of Cooperative Mechanisms and Clinical Opportunities. Brachytherapy –2018 Nov-Dec; 17(6):995-1003. PMID: 30078541

Kang, KH, Okoye, CC, **Patel, RB**, Siva, S, Biswas, T, Ellis, RJ, Yao, M, Machtay, M, Lo, SS. Complications from Stereotactic Body Radiotherapy for Lung Cancer. Cancers 2015 Jun; 7(2):981-1004. PMID: 26083933
Role – I helped to write and edit the paper.

Marron, T, Ryan, A, Reddy, S, Kaczanowska, S, Younis, R, Takkar, D, Zhang, J, Bartkowiak, T, Howard, R, Anderson, K, Olson, D, Naqash, A, **Patel RB**, Sachdev, E, Rodriguez-Ruiz, M, Sheffer, M, Church, S, Fuhrman, C, Overacre-Delgoffe, A, Nguyen, R, Florou, V, Thaxton, J, Aggen, D, Guerriero, J. Considerations for treatment duration in responders to immune checkpoint inhibitors. JITC 2021 Mar;9(3). PMID: 33653801
Role – I helped to write and edit the paper.

Salerno KE, Roy S, Ribaudo C, Fisher T, **Patel RB**, Mena E, Escorcia FE. A primer on radiopharmaceutical therapy. IJROBP 2022 Aug 13. PMID: 35970373
Role – I helped to write and edit the paper.

Bellavia MC, **Patel RB**, Anderson CJ. Combined targeted radiopharmaceutical therapy and immune checkpoint blockade: From preclinical advances to the clinic. JNM 2022 Nov:63(11):1636-1641. PMID: 36215570
Role – I mentored a student to write the paper and edited the paper.

Becka JM, **Patel RB**, White, GA, Boike, T, Escorcia, FE. Radiation Oncologists and Radiopharmaceutical Therapy: Strategies for Addressing Fair Compensation. PRO 2023 (13):496-498. PMID: 37923492
Role – I co-wrote the paper and edited the paper.

3. OTHER NON-PEER REVIEWED PUBLICATIONS

Folkert MR, Patel RB, Salerno KE, Escorcia FE. Radiopharmaceutical Therapy: Emerging Horizons. ASTRO News Winter 2023 Issue
Role –I helped write and edit this article.

4. BOOKS, BOOK CHAPTERS AND MONOGRAPHS

Shaakir Hasan, D.O., Christian Okoye, M.D., **Ravi Patel, M.D.,Ph.D**., Tithi Biswas, M.D., Min Yao, M.D., Ph.D., Rodney J. Ellis, M.D., Mitchell Machtay, M.D., Simon S. Lo, M.D., DABR, FACR. The Treatment of Extracranial Oligometastases with Advanced Therapeutic Techniques. In: Fairchild, A Ed. Palliative Radiation Therapy: Utilization of Advanced Technologies. Nova Science Publishers, 2015.

Christian Okoye, M.D., **Ravi Patel, M.D., Ph.D**., Simon S. Lo, M.D., David Mansur, M.D., Alia Hdeib, M.D., Arjun Sahgal, M.D., FRCPC, Eric L. Chang, M.D., Mitchell Machtay, M.D., John H. Suh, M.D., Andrew E. Sloan, M.D., FAC. Stereotactic Radiosurgery for Pediatric Brain Tumors. In: Lunsford and Sheehan Ed: Intracranial Stereotactic Radiosurgery. 2nd Ed. New York, NY: Thieme, 2015.

5. PUBLISHED ABSTRACTS (in Scientific Journals)

Patel, R, Tami, A.E., Knothe Tate, M. Comparison of Globular and Linear Polymeric Tracers in Studying Bone Fluid Flow. Biomedical Engineering Society Annual Meeting, Nashville, TN. Oct 2003. –poster presentation

Patel, R, Mann, J.A., Knothe Tate, M. Effect of hindered diffusion on bone permeability to different molecular weight species. Biomedical Engineering Society Annual Meeting, Nashville, TN, Oct 2003. –poster presentation

Patel, R, Tami, A.E., Knothe Tate, M. Defining the Upper Permeability Limit of Large Molecular Weight Molecules in Cortical Bone. Annual Meeting of the Orthopedic Research Society, San Fransicso, CA, Mar 2004. – poster presentation

Knothe Tate, M.L., **Patel, R**., Tami, A.E., Sorkin, A., Coley, M. Study of Interplay Between Mechanics, Materials, Transport & Biology Across Length Scales Using Bone As a Robust "Test Bed". European Society of Biomechanics, 's- Hertogenbosch, Netherlands, July 2004. – Key Note Address, Bone Remodeling and Adaptation Session

Patel, R, Tami, A, Knothe Tate, M. Permeability of Interosseous Ligament Under Loaded and Unloaded Conditions. Annual Meeting of the Biomedical Engineering Society, Philadelphia, PA, Oct 2004 – poster presentation

Bhatt, S, **Patel, R**, O'Leary, J, Knothe Tate, M. Measuring Diffusion and Permeability of Bone Using Fluorescence Recovery After Photobleaching (FRAP). Annual Meeting of the Biomedical Engineering Society, Philadelphia, PA, Oct 2004 – poster presentation

Patel, R, Tami, A.E., Knothe Tate, M. Permeability of Cortical Bone to Large Molecular Weight Proteins Under Diffusive and Load-Induced Convective Transport Mechanisms. ASME International Mechanical Engineering Congress, Anaheim, CA, Nov 2004 – Oral Presentation

Tami, A.E., Suresh, G, **Patel, R**, Knothe Tate, M. Effect of Interosseous Membrane on Load Transfer in Rat Forelimb Using Finite Element Analysis. ASME International Mechanical Engineering Congress, Anaheim, CA, Nov 2004 – Poster Presentation

Patel, R, O'Leary, J, Bhatt, S, Knothe Tate, M. Determining the Permeability of Cortical Bone at Multiple Length Scales Using Fluorescence Recovery After Photobleaching Techniques. Orthopedic Research Society Annual Meeting, Washington DC, Feb 2005 – Oral presentation

Steck, R, **Patel, R**, Para, C, Knothe Tate, M. Computational and Experimental Column Chromatography Models Enhance Our Understanding of Bone's Molecular Sieving Characteristics. Orthopedic Research Society Annual Meeting, Washington DC, Feb 2005 – poster presentation

Patel RB, Weinberg BD, Gao J, Saidel GM, Exner AA. Analyzing Intratumoral Chemotherapeutic Drug Penetration in Ablated Tumors Using Finite Element Methods. Society for Biomaterials, Chicago, IL, April 19, 2007 – Oral Presentation

Weinberg BD, **Patel RB**, Exner AA, Saidel GM, Gao J. Estimating Local Doxorubicin Transport Properties of Experimental Liver Carcinoma. Society for Biomaterials, Chicago, IL, April 19, 2007 – Poster Presentation

Wu, H, Exner, AA, Krupka, TM, **Patel, RB**, Haaga, J. Perfusion Change after Radiofrequency Ablation of a Subcutaneous Tumor: Evaluated with Functional CT. RSNA, Chicago, IL, Nov. 2008. – Oral Presentation

Paul, S, Park, JJ, Yutzy, SR, **Patel, RB**, Nour, SG, Abdul Karim, FW, Saidel, GM, Duerk, JL. MRI Monitoring and Mathematical Modeling to Predict Tissue Lesion Size from Laser Thermal Ablation. ISMRM, Toronto, ON, June 2008. – Poster Presentation.

Patel, RB., Carlson, A., Solorio, L., Exner, AA. Optimizing in situ forming drug delivery implants to deliver low molecular weight drugs. ASCI/AAP Joint meeting annual meeting, Chicago, IL, Apr 24-26 2009. – Poster Presentation

Patel, RB., Carlson, A., Solorio, L., Exner, AA. Characterization of formulation parameters affecting low molecular weight drug release from in situ forming drug delivery systems. Society for Biomaterials, San Antonio, TX, Apr 24, 2009 – Poster Presentation

Solorio, L., Babin, B., **Patel, RB**, Exner, AA. Reproducible non-invasive characterization of in situ forming implants using ultrasound. Society for Biomaterials, San Antonio, TX, Apr 24, 2009 – Poster Presentation

Patel, RB., Solorio, L., Wu, H., Krupka, T, Exner, AA. Characterization of in vivo drug release from in situ forming drug delivery implants. Society for Biomaterials, Seattle, WA, Apr 22-24 2010 – Oral Presentation

Solorio L, Babin B, **Patel RB**, Exner AA. Noninvasive in vivo characterization of in situ forming implants using ultrasound. Controlled Release Society, Portland, OR, June 2010 – Poster Presentation

Patel, RB, Saidel, GM, Exner, AA. Model analysis of implant formation and drug release from in situ forming implants. Biomedical Engineering Society Annual Meeting, Austin, TX, Oct. 6-9 2010 – Poster Presentation.

Wu, H, **Patel R**, Solorio L, Krupka TM, Exner AA. Differentiation of benign periablational enhancement from residual tumor with contrast-enhanced ultrasonography following radiofrequency ablation in an experimental rodent model of colorectal cancer. Society of Interventional Radiology 36th annual scientific meeting, Chicago, IL, March 2011 – Oral Presentation

Solorio L, Olear A, Hamilton J, Krupka T, **Patel RB**, and Exner AA.The Role of Varying PLGA Molecular Weight Blends Drug Release and Phase Inversion. Society for Biomaterials, Orlando, Florida, March 2011 – Oral Presentation

Patel, R, Chiu, SM, Machtay, M, Oleinick, NL. Interference with Repair of Sub-lethal Radiation Damage by ABT-888, an Inhibitor of Poly(ADP-ribose) Polymerase (PARP), and Theobromine. American Association for Cancer Research, Chicago, Illinois, April 2012 – Poster Presentation

Ellis, RJ, **Patel, RB**, Kunos, C, Zhang, Y, Brindle, J, Kudithipudi, V, Kaminsky, DA, Ponsky, L. Stereotactic Radiosurgery for Renal Cancer: Phase I Safety and Toxicity. American Society for Radiation Oncology, Boston, Massachusetts, October 2012 – Poster Presentation

Biswas, T; Patel, R; Weeks, L; **Patel, RB**; Sharma, N, Dowlati, A;Oleinick, NL; Gerson, SL Machtay, M. Enhanced radiosensitization of lung adenocarcinoma cells by Pemetrexed when combined with methoxyamine to inhibit base excision repair American Society for Radiation Oncology, Boston, Massachusetts, Sept 2013 – Poster Presentation

Patel, RB, Traughber, B, Kaminsky, D, Pirozzi, S, Nelson, A, Piper, K, Lu, MM, Machtay, M, Ellis, R. Evaluation of an Atlas-based Segmentation Method for High Risk Prostate Cancer with RTOG

Defined Pelvic Lymph Node Levels. American Society for Radiation Oncology, San Francisco, California, Sept 2014 – Oral Presentation

Patel, RB, Okoye, CC, Hwaung, L, Biwas, T. Increased Survival Associated with Post-Operative Radiation in Gastric Cancer Before and After MAGIC Trial: A population-based study. repair American Society for Radiation Oncology, San Francisco, California, Sept 2014 – Poster Presentation

Patel, RB, Patel, R, Biswas, T, Fu, P, Machtay, M, Oleinick, NL. Combining Pemetrexed with methoxyamine to enhance the radiosensitization of non-small-cell lung cancer (NSCLC): Prelinical Studies in vivo. American Association of Cancer Research, Philadelphia, PA, April 2015 – Poster Presentation

Patel, RB, Perera, R, Exner, AA, Oleinick, N. "Pluronic coblock polymer L10 demonstrates Promise as novel radiosensitizing agent for human colorectal cancer." American Society for Radiation Oncology, San Antonio, Texas, Oct 2015 – Poster Presentation

Kan, C, **Patel, R**, Biswas, T. Distribution of newly diagnosed breast cancers by Subtype and Race using SEER database. American Society for Radiation Oncology, San Antonio, Texas, Oct 2015 – Poster Presentation

Kan, C, Silverman, P, **Patel, R**, Lyon, J. Risk of radiation pneumonitis in node positive breast cancer treated with concurrent paclitaxel. American Society for Radiation Oncology, San Antonio, Texas, Oct 2015 – Poster Presentation

Okoye, CC, **Patel, RB**, Baydoun, A, Zender, CA, Gibson, M, Lavertu, P, Rezaee, R, Fowler, N, Machtay, M, Yao, M. Patterns of failure in salivary gland cancer after intensity-modulated radiotherapy. American Head and Neck Society, Seattle, Washington, June 2016 – Poster Presentation

DiCamillo, PA, Shvarts, MB, **Patel, RB**, Mitra, J, Tiwari, P, Cook, SD, Cadavid, D, Naismith, RT , Lancia, S, Wolansky, LJ. Characterization of Gadolinium Deposition in the Brain Manifest as T2-hypointensity and T1-hyperintensity Associated with Repeat Monthly Triple-Dose Gadopentetate Dimeglumine Administration for 2 years in the BECOME Trial. Proceedings of the International Society for Magnetic Resonance in Medicine (ISMRM), Honolulu, HI, May 2017 – Poster Presentation

Shamp, SJ, **Patel, RB**, Biswas, TB. Palliative radiation therapy in extensive stage small cell lung cancer (ES-SCLC): A Survival, Epidemiology and End Results (SEER) Analysis. American Society for Radiation Oncology, San Diego, CA, Sept 2017 – Poster Presentation

Grudzinski, JJ, Carlson, P Marsh, IR, Hernandez, R, Morris, ZS, Bednarz, B, Gilles, S, Loibner, H, **Patel, R**, Sondel, P, Weichert, J. Theranostic Combination of Molecularly Targeted Radiotherapy and Immunotherapy Optimizes Therapeutic Response in a Syngeneic Murine Model of Melanoma. SNMMI, Philadelphia, PA. June 2018 – Oral Presentation

Hernandez, R, **Patel, R**, Grudzinski, JJ, Carlson, P, Sriramaneni, R, Brown, R, Bednarz, B, Sondel, P, Morris, Z, Weichert, J. Combination of targeted radionuclide therapy and checkpoint blockade augments therapeutic response in a syngeneic murine model of melanoma. SNMMI, Philadelphia, PA. June 2018 – Oral Presentation

Patel, RB, Hernandez, R, Brown, R, Grudinski, J, Carlson, P, Sriramaneni, R, Korman, A, Bednarz, B, Sondel, PM, Weichert, J, Morris, Z. Determining the optimal dose and timing of molecular targeted radiotherapy to enhance responsiveness of immune checkpoint blockade. Radiation Research Society, Chicago, IL, Sept 2018 – Oral Presentation - SIT Travel Award Recipient

Patel, RB, Hernandez, R, Brown, R, Grudinski, J, Carlson, P, Sriramaneni, R, Korman, A, Bednarz, B, Sondel, PM, Weichert, J, Morris, Z. Systemic administration of molecularly targeted radiotherapy (MRT) improves the efficacy of anti-ctla4 in a murine B78 melanoma model." American Society for Radiation Oncology, San Antonio, TX, Oct 2018 – Oral Presentation

Voeller J, Erbe AK, Rasmussen K, Slowinski J, VandenHeuvel S, **Patel RB**, Loibner H, Gillies SD, Hank JA, Rakhmilevich A, Morris ZS, Sondel PM. Local radiation with intratumoral anti-disialoganglioside (anti-GD2) and interleukin-2 (IL2) induces significant tumor responses with immunologic memory in a syngeneic murine NXS2 neuroblastoma model. Poster accepted at: 9thAnnual Young Investigator Session at the Fall 2018 Children's Oncology Group (COG) Meeting; October 2018; Dallas, TX and the 33rdAnnual Meeting of the Society for Immunotherapy of Cancer (SITC); November 2018; Washington, D.C.

Patel, RB, Hernandez, R, Brown, R, Grudinski, J, Carlson, P, Sriramaneni, R, Korman, A, Bednarz, B, Sondel, PM, Weichert, J, Morris, Z. A novel molecularly targeted radiotherapeutic agent (MTRT) to deliver immunomodulatory radiation to multiple pediatric and adult solid tumors." Radiological Society of North America, Chicago, IL, Nov 2018 – Oral Presentation

Patel, RB, Hernandez, R, Brown, R, Zangl, L, Jaquish, A, Grudinski, J, Carlson, P, Sondel, PM, Weichert, J, Morris, Z Molecular targeted radiotherapy (MTRT) enhances the efficacy of immunotherapy increasing complete response rates of both local and distant disease in a "cold" tumor models." Society of Immunotherapy in Cancer. Washington DC, Nov. 2018 – Poster Presentation - Young Investigator Award Recipient

SITC Sparkathon Team. A SITC-sponsored randomized clinical trial to determine criteria to guide clinicians on when to stop immunotherapy through a community-driven data repository, leveraging the SITC community" Society of Immunotherapy in Cancer. Washington DC, Nov. 2018 – Poster Presentation – Late Breaking Abstract

Hernandez, R, Grudzinski, JJ, Walker, KL, **Patel, RB**, Alucio-Sarduy, E, Pinchuk, A, Engle, JW, Capitini, CM, Morris, ZS, Weichert, J. Novel targeted radionuclide therapy affords a durable response and tumor immunity in a syngeneic model of T- cell NHL. EANM 2018, Dusseldorf, GE, 2018. - Oral Presentation

Hernandez, R, **Patel, RB**, Grudzinski, JJ, Alucio-Sarduy, Brown, R, Sriramaneni, R, Engle, JW, Sondel, PM, Morris, ZS, Weichert, J. Novel targeted radionuclide therapy approach enhances response to immune checkpoint blockade in murine melanoma EANM 2018, Dusseldorf, GE, 2018. - Oral Presentation

Ye, M, **Patel, RB**, Carlson, P, Zangl, L, Arthur, I, Ma, B, Wang, Y, Xie, R, Sondel, P, Morris, Z, Gong, SS. A Bacterial Membrane Coated Nanoparticle in Combination with Radiation Therapy for In Situ Tumor Vaccination. SFB 2019, Seattle, WA, 2019 – Poster Presentation

Brown, RJ, Hernandez, R, Grudzinski, JJ, Zangl, L, Arthur, I, Pieper, A, Marsh, IR, Bednarz, B, Weichert, J, Sondel, PM, Rakhmilevich, A, Morris, ZS, **Patel, RB**. Ability of molecularly targeted radionuclide therapy and anti-CTLA-4 to prevent spontaneous metastases in a preclinical Lewis lung carcinoma model" American Society for Radiation Oncology, Chicago, IL, Sept 2019 – Poster Presentation

Zangl, L, Pieper, A, Arthur, I, Brown, R, Rakhmilevich, A, Sondel, P, Morris, Z, **Patel, RB**. External beam radiotherapy required for tumor regression when using CpG-Oligodeoxynucleotide and anti-Ox40 in an immunologically cold tumor model." American Society for Radiation Oncology, Chicago, IL, Sept 2019 – **Oral Presentation**

Grudinski, J, **Patel, RB**, Hernandez, R, Brown, R, Zangl, L, Carlson, P, Sondel, P, Weichert, J, Morris, Z. 90Y-NM600 improves survival in a clinically relevant immunologically cold melanoma model when combined with immunotherapies. European Association of Nuclear Medicine. Oct. 2019 – Oral Presentation

Grudinski, J, Hernandez, R, Marsh, I, **Patel, RB**, Alucio-Sarduy, E, Engle, J, Morris, Z, Bednarz, B, Weichert, J. NM600, a theranostic alkylphosphocholine, shows promise as a universal tumor-targeting agent. European Association of Nuclear Medicine. Oct. 2019 – Oral Presentation

Patel, RB, Ye, M, Carlson, PM, Jaquish, A, Zangl, L, Ma, B, Wang, Y, Arthur, I, Xie, R, Brown, R, Wang, X, Sriramaneni, R, Kim, K, Gong, S, Morris, ZS. Combination radiation and bacterial membrane coated nanoparticle improves tumor response rates and survival in immunologically "cold" preclinical tumor models. Radiation research Society, San Diego, CA, Nov 2019 – Oral Presentation. - SIT Travel Award Recipient

Jagodinsky, J.C., Chakravarty, I, Arthur, I.S., Castillo, J.S., Zangl, L.M., Brown, R.J., **Patel, R.B**, Morris, Z.S. Time Course of Type I Interferon Activation Following Radiation. Rad Res Soc. Nov. 2019 – Poster Presentation

Patel, RB, Hernandez, R, Carlson, PM, Zangl, L, Jagodinsky, J, Bates, A, Grudzinski, J, Sondel, PM, Weichert, J, Morris, ZS. Mechanistic insights into combination low dose targeted radionuclide and checkpoint blockade treatment to turn a "cold" tumor "hot"." Society of Immunotherapy in Cancer, National Harbor, MD, Nov 2019 – Poster Presentation.

Carlson, P.M., Mohan, M., **Patel, R.B**., Nettenstrom, L, Sheerar, D., Fox, K., Birstler, J., Rodriquez, M., Hoefges, A., Hernandez, R., Zahm, C., McNeel, D., Weichert, J., Morris, Z.S., Sondel, P.M. A technique for preparing radioactive tissue for analysis by flow cytometry. SITC Nov. 2019 – Poster Presentation.

Pieper A, Rakhmilevich A, Spiegelman D, **Patel R**, Baniel C, Erbe A, Hank J, Charych D, Overwijk W, Morris Z, Sondel P. Bempegaldesleukin in combination with local radiation and systemic checkpoint blockade induces a robust systemic anti-tumor immunity. Society of Immunotherapy in Cancer. Washington DC, Nov. 2019 – Poster Presentation

Carlson, P.M., Patel, R.B., Rodriquez, M., Sun, C, Hernandez, R, Grudzinski, J, Jagodinsky, J, Rakhmilevich, A, Kim, KyungMan, Birstler, J, Marsh, I, Bednarz, B, Weichert, JP, Sondel, PM, Morris, ZM. Low dose targeted radionuclide therapy enhances propagation of the antitumor response following in situ vaccination in a syngeneic murine melanoma model. RRS Winter Workshop Mar. 2020 – Poster Presentation.

Bates, AM, Patel, R.B., Hernandez, R, Grudzinski, JJ, Sosa, GA, Marsh, I, Bednarz, B, Pieper, A, Nystein, E, Emma, S, Sumiec, EG, Weichert, JP, Morris, ZM. 90Y-NM600 targeted radionuclide therapy combined with bempegaldesleukin (NKTR-214) and immune checkpoint inhibition enhances the immune response in a syngeneic murine model of head and neck cancer. RRS Winter Workshop Mar. 2020 – Oral Presentation.

Sosa, GA, Bates, AM, Patel RB, Hernandez R, Grudinski, JJ, Marsh I, Bednarz B, Pieper AA, Nysteun E, Emma S, Sumiec EG, Weichert JP, Morris ZS. In vivo efficacy of bempegaldesleukin, immune checkpoint inhibition, and radionuclide therapy in a immunocompetent murine model of head and neck cancer. AACR Annual Meeting Apr 2020 – Poster Presentation

Jagodinsky JC, Arthur IS, Castillo JC, Chakarvarty I, Zangl LM, Brown RJ, Patel RB, Jin WJ, Carlson PM, Hernandez R, Grudinski, JJ, Marsh I, Weichert JP, Bednarz BP, Morris ZS. In vivo efficacy of bempegaldesleukin, immune checkpoint inhibition, and radionuclide therapy in a immunocompetent murine model of head and neck cancer. AACR Annual Meeting Apr 2020 – Poster Presentation

Brown, RJ, Zangl, L, Arthur, I, Pieper, A, Carlson, PM, Castillo, J, Sondel, PM, Rakhmilevich, A, Morris, ZS, **Patel, RB**. Combination of bempegaldesleuikin and anti-CTLA4 prevents metastatic dissemination after primary surgery or radiation therapy in a preclinical model of non-small cell lung cancer." AACR Annual Meeting – Virtual, June 22, 2020 – Poster Presentation

Grudzinkski, J, Bates, AM, Hernandez, R, Sosa, GA, Nysteun E, Emma S, Sumiec EG, Pieper, AA, **Patel, RB**, Alucio-Sarduy, E, Engle, JA, Marsh, I, Bednarz, B, Weichert JP, Morris ZS. 90Y-NM600 combined with bempegaldeuskin (NKTR-214) improves response to immune checkpoint inhibition in a syngeneic murine model of head and neck cancer. EANM Oct 2020, Vienna, Austria – Featured Oral Presentation

Feils A, Heck M, Hoefges A., Carlson P, **Patel RB**, Kravtsov D, Hank JA, Morris ZS,

Rakhmilevich AL, Sondel PM, Erbe AK. CD4 T cells are essential for an anti-tumor effect in a B78 murine melanoma tumor model. SITC Annual Meeting Nov 2020 – Poster Presentation

Nyiranshuti L, Bellavia MC, Latoche JD, Fecek RJ, Taylor JL, Nigam S, Storkus WJ, **Patel RB**, Anderson CJ. PET Imaging of Upregulated VLA-4 in a New $BRAF^{V600E}$ Mouse Model of Melanoma. SNMMI Annual Meeting May 2021 – Oral Presentation

Emma SE, Bates AM, Hernandez R, Grudzinski JJ, Marsh IR, Jagodinsky JC, Bednarz BP, Pieper AA, Sumeic EG, Nystuen EJ, Sosa GA, **Patel RB**, Weichert J, Morris ZS. Mechanisms of cooperative response to bempegaldesleukin (BEMPEG) and 90Y- NM600 targeted radionuclide therapy in the treatment of a syngeneic murine model of head and neck squamous cell carcinoma. AACR Annual Meeting Apr 2021 – Poster Presentation

Sumiec EG, Bates AM, Hernandez R, Grudzinski JJ, Marsh IR, Emma SE, Nystuen EJ, Jagodinsky JC, Pieper AA, Sosa GA, Bednarz BP, **Patel RB**, Weichert J, Morris ZS. In vivo synergy of 90Y-NM600 and Bempegaldesleukin improves anti-tumor efficacy of immune checkpoint inhibitors in syngeneic murine cancer models. AACR Annual Meeting Apr 2021 – Poster Presentation

Spiegelman DV, Pieper AA, Zangl LM, Fiels A, Hoefges A, Felder MA, Moram S, Rakhmilevich AL, Erbe AK, Hank JA, **Patel RB**, Morris ZS, Sondel PM. Local radiation in combination with CPG and anti-OX40 induces enhanced T cell activation and proliferation. SITC Annual Meeting Nov 2021 – Poster presentation

Fiels A, Heck M, Hoefges A, Carlson P, Zangl L, **Patel RB**, Kravtsov D, Hank JA, Morris ZS, Rakhmilovich AL, Sondel PM, Erbe AK. CD4 T cell help is essential for an anti-tumor effect in a B78 murine melanoma tumor model. SITC Annual Meeting Nov 2021 – Poster presentation

Bellavia MC, Nyiranshuti L, Latoche JD, Ho KV, Fecek R, Taylor JL, Day KE, Nigam S, Pun M, Gallazzi F, Edinger RS, Storkus WJ, **Patel RB**, Anderson CJ. Validation of VLA-4-Targeted PET Imaging in a New BRAFV600E Mouse Melanoma Model. ACS Annual Meeting Mar 2022 – Poster Presentation

Bellavia MC, Wickre P, Grudinski J, Latoche JD, Day KE, **Patel RB**, Anderson CJ. Monte Carlo Dosimetry for ^{67}Cu-LLP2A in a BRAFV600E Melanoma Mouse Model from ^{64}Cu-LLP2A PET Imaging Data. WMIC Sept 2022 – Oral presentation

Erbe AK, Fiels AS, Hampton A, Spiegelman D, Tsarovsky N, Hoefges A, Carlson PM, Pieper A, Haerle C, Heck M, VandenHeuvel S, Frankel L, Zebertavage L, Heaton A, Morris ZS, **Patel RB**, Rakhmilovich AL, Sondel PM, Erbe AK. CD4 T Cell-Driven Response to Immunotherapy Against Mouse B78 Melanoma Tumors. AACR Annual Meeting Apr 2023 – Poster presentation

Bellavia MC, JosefssonA, Marsh I, Wickre P, Grudzinski J, Latoche JD, Day KE, **Patel RB**,

Anderson CJ. Comparison of Voxelized Monte Carlo and OLINDA Dosimetry Methods Towards 67Cu-LLP2A Therapy from 64Cu-LLP2A PET/CT Imaging Data. ISRS May 2023 – Poster presentation

Patel RB, Rajkumar H, Bellavia M, Koerner S, Edinger R. Reverse abscopal effect (whole mouse radiation with tumor shielded) enhances efficacy of immune checkpoint blockade in preclinical tumor models" Radiation Research Society, Kona, HI, Oct 2022 – Poster Presentation

Patel RB, Rajkumar H, Bellavia M, Koerner S, Edinger R. Reverse abscopal effect enhances efficacy of immune checkpoint blockade in preclinical tumor models" 16th International Wolfsberg Meeting on Molecular Radiation Biology/Oncology. Hurdalsjoen, Norway, June 2023 – Poster Presentation

Rajkumar H, Gonzalez JR, Edinger R, Bellavia M, Josefsson AN, Nedrow J, Anderson C, Escorcia FE, Nguyen R, **Patel RB**. VLA4 Targeted Cu-64/67 LLP2A can simultaneously target tumor and immune cells for potential adoptive T cell conditioning. International Congress for Radiation Research. Montreal, CA, August 2023 – Oral Presentation

Koerner S, Rajkumar H, Edinger B, **Patel RB**. Development of a Spatially fractionated murine GRID therapy platform for combination radiation immune checkpoint blockade therapy. International Congress for Radiation Research. Montreal, CA, August 2023 – Poster Presentation

Koerner S, Rajkumar H, Edinger B, Lalonde R, **Patel RB**. Combination Immunotherapy with Partial or Whole Tumor Radiotherapy in a Preclinical Melanoma Tumor Model. ASTRO Annual Meeting. San Diego, CA, Oct 2023 – Poster Presentation

Walter KL, Edinger RS, Harikrishnan H, Kaufmann BA, Duvall SA, **Patel RB**. Downregulation of TFAM enhances the sensitivity of Human Papillomavirus-negative head and neck cancer to radiation and immunotherapy. BMES Annual Meeting. Seattle, WA, Oct 2023 – Poster Presentation

Sheeri AR, Edinger RS, Rajkumar H, **Patel RB**. Novel anti-PD-L1-IL15 diabody immunocytokine in combination with radiation therapy improves response rates in immune resistant murine head and neck cancer. AACR Annual Meeting. San Diego, CA Apr 2024 – Poster Presentation

Elangovan V, Edinger RS, Rajkumar H, Bhise A, Nedrow JR, Escorcia FE, **Patel RB**. Production and preclinical evaluation of Glypican-3 as a targeted therapy. AACR Annual Meeting. San Diego, CA Apr 2024 – Poster Presentation.

Amatore F, Sridaran S, Karunamurthy A, Wang H, **Patel R**, Pugliano-Mauro M, Kim SW, Choudry MHA, Pingpank JF, Holtzman MP, Duvvuri U, Ferris RL, Luke JJ, Kirkwood JM, Najjar YG, Pullara F, Cennubhotla C, Zarour HM, Davar D. Neoadjuvant pembrolizumab produces high pathologic response rates in locally advanced (LA) resectable cutaneous squamous cell carcinoma (cSCC):

Final Results. ASCO Annual Meeting. Chicago, IL June 2024 – Poster Presentation.

Yaghoubian E, Jelenik M, Becker M, Bennet K, Zia N, Escorcia F, Wong R, Chablani P, Appleman L, Saoudi A, Huq S, Olson A, Wang H, Skinner H, Patel R. Multivariate Analysis of Pretreatment Biomarkers Predicting Treatment Completion in Patients Undergoing Lu-177-PSMA-617 Radiopharmaceutical Therapy. ASTRO Annual Meeting. October 1st, 2024.

6. ABSTRACTS (not published in Scientific Journals)

Patel, R, Mann, J.A, Knothe Tate, M. Bone permeability to different molecular weight species using osteon mass transport model. 5th International Bone Fluid Flow Workshop, Cleveland, OH, Sept 2003. – commented poster presentation
Patel, R, Tami, A.E, Knothe Tate, M. Permeability of Cortical Bone to Large Molecular Weight Albumin Tracers. BioOhio Meeting, Columbus, OH, Oct 2003. – poster presentation

Patel, R, Tami, A.E., Knothe Tate, M. Permeability of Cortical Bone Under Convective and Diffusive Molecular Transport. Case Western Reserve University Research Showcase, Cleveland, OH, Apr 2004. – Poster Presentation

Suresh, G, Tami, A.E., **Patel, R**, Knothe Tate, M. Effect of Interosseous Membrane on Load Transfer in Rat Forelimb. Case Western Reserve University Research Showcase, Cleveland, OH, Apr 2004. – Poster Presentation

Patel, R, Tami, A.E., Knothe Tate, M. Permeability Through the Nanoporous Network in Bone. Nanoscience and Nanotechnology Research Symposium, Cleveland, OH, Oct 2004. – Poster Presentation

Patel, R, O'Leary, J, Bhatt, S, Knothe Tate, M.L. Determining the Permeability of Cortical Bone at Multiple Length Scales Using Fluorescence Recovery After Photobleaching Techniques. Case Western Reserve University Research Showcase, Cleveland, OH, Apr 2005 – poster presentation

Steck, R, **Patel, R**, Para, C, Knothe Tate, M. Computational and Experimental Column Chromatography Models Enhance Our Understanding of Bone's Molecular Sieving Characteristics. Case Western Reserve University Research Showcase, Cleveland, OH, Apr 2005 – poster presentation

Patel, R, O'Leary, J, Bhatt, S, Knothe Tate, M. Measuring Permeability and Anisotropy Effects of Cortical Bone Using FRAP. Bone Fluid Flow Workshop, NY, NY, Sept 21, 2005 – Oral presentation

Weinberg BD, **Patel RB**, Exner AA, Saidel GM, Gao J. Estimating Local Doxorubicin Transport from Intratumoral Implants Using a Finite Element Model. International Symposium on Recent Advances in Drug Delivery Strategies, Salt Lake City, UT. February 26, 2007 – Poster Presentation

Solorio L, Babin BM, **Patel RB**, Exner AA. Reproducible noninvasive characterization of in situ forming implants using ultrasound. Biomaterials Day, Lexington, KY, 2009 – Oral Presentation

Patel, RB, Chiu, SM, Machtay, M, Oleinick, NL. Interference with Repair of Sub-lethal Radiation Damage by ABT-888 and Theobromine. NEOMED Research Day, Rootstown OH, April 2013 – Oral Presentation Award Winner

PM Carlson, J Grudzinski, R Hernandez, IR Marsh, **R Patel**, CM Heinze, SD Gillies, H Loibner, AL Rakhmilevich, M Otto, B Bednarz, J Weichert, PM Sondel, ZS Morris. Molecular targeted alkyl phosphocholine-mediated radiotherapy synergizes with immunotherapy for potent in situ vaccination in a syngeneic murine melanoma model. ImmunoOncology Summit, San Diego, CA. January 2018 – Poster Presentation

Patel, RB, Hernandez, R, Brown, R, Grudinski, J, Carlson, P, Sriramaneni, R, Korman, A, Bednarz, B, Sondel, PM, Weichert, J, Morris, Z. Systemic Delivery of Molecular Targeted Radiotherapy (MTRT) Improves Efficacy of Anti-CTLA4 in a Murine Melanoma Model. Immuno-oncology Young Investigators Forum, Houston, TX, Apr 2018 – Oral Presentation, Clinical Fellow Award and Grant Recipient

Erbe, AK, Komro, K, VandenHeuvel, S, Hoefges, A, Feils, A, Heck, M, Voeller, J, Pieper, A, Mohan, M, Carlson, PM, **Patel, RB**, Hank, JA, Rakhmilevich, A, Morris, ZS, Chaudhary, A, St Croix, B, Sondel, PM. Antitumor Effects of Radiation Combined with Tumor-targeted and Vasculature-targeted mAbs and IL2. Keystone Symposia 2019, Whistler, British Columbia, Canada – Poster Presentation

Patel, RB, Hernandez, R, Brown, R, Zangl, L, Jagodinsky, J, Bates, A, Grudzinski, J, Carlson, PM, Sondel, PM, Weichert, J, Morris, ZS. Molecular targeted radionuclide therapy enhances the efficacy of immunotherapy, increasing response rates of both localized and metastatic disease in "cold" tumor models" Cancer Moonshot Collaborative Meeting, Bethesda, MD, Nov 2019 – Poster Presentation

PROFESSIONAL ACTIVITIES

TEACHING

Undergraduate Student Teaching:

2006-2007 CWRU Teaching Assistant, EBME 105: Intro to Biomedical Engineering, 80-100 students/year.

2006-2008 CWRU Teaching Assistant, EBME 370/380: Principles of Biomedical Engineering Design Experience 10-20 students/year

2007 CWRU Lecturer, EBME 105: Intro to Biomedical Engineering – 80-100 students

2007 CWRU Lecturer, EBME 316: Biomaterials for Drug Delivery ~ 30 students

Medical Student Teaching:

2009 Small Group Facilitator, IQ Group - Block 4 – Homeostasis, first yr medical students, 10, 20/year

2018-2019 Lecturer, Radiation Oncology Basic Science Selective, medical students, 3-5, 2/year

Graduate Student Teaching:

2007 Lecturer, EBME 316, graduate students/undergraduate students, ~25, 2 sessions/year

2020 Lecturer, Radiobiology 410, graduate students, ~20, 1 session

2020-2023 Michael Bellavia – PhD Thesis completed under my guidance.

Resident Teaching:

2012-2013 Topic Lectures, Resident Teaching Conference, Residents and Interns, 25, 3 sessions/year

2013-2017 Presenter, Resident Case Conference, Residents and Faculty, 10, 15 session/year

2013-2017 Presenter, Morbidity and Mortality Conference, Residents and Faculty, 25, 2 session/year

2020 Lecturer, Radiobiology Elective, Residents, 4, 1 session

2020-2023 Radiation Oncology Case Conference and Skin Cancer and Radiopharma Lectures – 8 residents, 3 case conferences and 5 lectures.

2022-2023 Resident Research Opportunities Presentation – given annually.

2020-2024 – Resident clinical rotations – 1-4 residents rotate with me each year for a 5 week or 10 week block.

Fellow Teaching:

2022-2024 – Hematology-Oncology Fellows Lectures Series ~ 15 fellows, Intro to Radiation Oncology lecture – one lecture a year.

April 2020 Organizer, SITC Meet the Expert Webinar – Finding a Job Academia vs Industry, Graduate Students, Postdoctoral Fellows, Clinical Fellows, 70, 1 session.

Faculty Development Teaching:

2022-2023 Discussion Leader, E-rounds Skin Cancer – Radiation Oncology Department faculty and residents, 30-40 learners, 1 session a year.

Curriculum Development/Teaching Products/Media Products:

2007-2008 Small Group Curriculum Development Committee – As an MSTP student in my PhD years, I served on a committee at CWRU Medical School to test and develop their new small group curriculum with non-expert faculty facilitators. This new format was implemented, and the curriculum was altered from being a primarily large group lecture-based curriculum to a small group curriculum.

Mentoring:

2003-2004 Role: Research Mentor, Mentee: Shweta Bhatt, Context: Shweta was an undergraduate student under my direct supervision when I was a masters student. She was funded as a part of my NSF REU Award. Achievements: M.D. at CWRU, works as a Reproductive Endocrinologist & Infertility Specialist, She presented research abstracts related to our work at national meetings.

2003-2004 Role: Research Mentor, Mentee: Jared O'Leary, Context: Jared was an undergraduate student under my direct supervision when I was a masters student. He was funded as a part of my NSF REU Award. Achievements: M.D. at Vanderbilt, works as an Assistant Professor of Medicine (Interventional Cardiology) at Vanderbilt. He presented research abstracts related to our work at national meetings. – **Same abstracts as above.**

2008-2010 Role: Research Mentor, Mentee: Angela Carlson, Context: Angela was an undergraduate student under my direct supervision when I was a graduate student. Achievements: M.S. in BME at CWRU, works at Fenwal Inc as a Sr. Principal Systemic Engineer.

2013-2015 Role: Research Mentor, Mentee: Kylie Kang, Context: Kylie was a medical student under my direct supervision when I was a resident. Achievements: Residency in Radiation Oncology at Wash U, works as an Assistant Professor in Radiation Oncology at the University of Washington, she published a first paper as well as several abstracts from our work.

2014-2016 Role: Research Mentor, Mentee: Lindsay Hwang, Context: Lindsay was a medical student under my direct supervision when I was a resident. Achievements: Residency in Radiation Oncology at USC, works as an Assistant Professor in Radiation Oncology at USC, she published a first author book chapter.

2017-2018 Role: Research Mentor, Mentee: Sarah Busche, Context: Sarah was an undergraduate student under my direct supervision when I was a research fellow. Achievements: Medical Student at UMN.

2017-2019 Role: Research Mentor, Mentee: Abigail Jaquish, Context: Abby was an undergraduate student under my direct supervision when I was a research fellow. Achievements: PhD student at UCSD

2017-2020 Role: Research Mentor, Mentee: Ryan Brown, Context: Ryan was an undergraduate student under my direct supervision when I was a research fellow. Achievements: MD PhD student at MCW. Ryan received several awards including a Goldwater

Scholarship, Hilldale Research Award, Study Abroad Scholars Award, Zillman Summer Research Award, Promega Scientific Internship, and AACR Undergraduate Research Scholar Award. He published a first author manuscript for which I was a last author.

2017-2020 Role: Research Mentor, Mentee: Luke Zangl, Context: Luke was an undergraduate student under my direct supervision when I was a research fellow. Achievements: MD PhD student at MCW. Luke received several awards including a Hilldale Research Award, UW Biochemistry Research Award, and a NIH Summer Internship. He published a first author manuscript for which I was a last author.

2017-2020 Role: Research Mentor, Mentee: Ian Arthur, Context: Ian was an undergraduate student under my direct supervision when I was a research fellow. Achievements: Medical student at MCW. Ian received a S.N. Bose Scholar Award.

2018-2019 Role: Research Mentor, Mentee: Sai Gungurthi, Context: I was Sai's Undergraduate Research Scholar Mentor which was a program for talented freshman to have an early start to research. Achievements: Whelton Summer Research Award.

2018-2020 Role: Research Mentor, Mentee: Juliana Castillo, Context: Juliana was an undergraduate student under my direct supervision when I was a research fellow. Achievements: Juliana has presented several research abstracts at national meetings.

2019-2020 Role: Research Mentor, Mentee: Michael Luy, Context: Michael was an undergraduate student under my direct supervision when I was a research fellow. Achievements: Michael has presented several research abstracts at national meetings.

2018-2019 Role: Research Mentor, Mentee: Gustavo Sosa, Context: Gustavo was a medical student under my direct supervision when I was a research fellow. Achievements: Residency in Medicine at UNLV, he received a Shapiro Medical Student Research Award for our work.

2020-2021 Role: Research Advisor, Mentee: Alexis Espinal, Context: Alexis was a medical student at Pitt to whom I taught research methods such as flow cytometry as well as provided editing help for publication. Achievements: First author paper.

2021-2023 Role: Research Advisor, Mentee: Philip Pifer, Context: Phil was a radiation oncology resident in our department to whom I taught research methods such as flow cytometry as well as provided editing help for his grant proposals. Achievements: Attending Physician at WVU, he received an ASCO YIA.

2020-2022 Role: PhD Advisor, Mentee: Michael Bellavia, Context: Michael was a graduate student in BME who transferred to my lab after his original advisor left. He completed his PhD under my mentorship and successfully defended his thesis. Achievements: Scientist at Invicro. Alavi-Mandell award. Published two first author publications under my mentorship as well as several abstracts at national meetings.

2020-present Role: Research Mentor, Mentee: Abhay Sheeri, Context: Abhay is an undergraduate student under my direct supervision at Pitt. Achievements: Health Sciences Research Fellowship Award

2021-201 Role: External Mentor Long Proposal, Mentee: Heilan He, Context: Heilan is a bioengineering graduate student for whom I served as an external mentor for her long proposal at Pitt. Achievements: Long proposal defended.

2021-present Role: Research Mentor, Mentee: Vignesh Elangovan, Context: Vignesh is an undergraduate student under my direct supervision at Pitt. Achievements: Health Sciences Research Fellowship Award

2021-present Role: Research Mentor, Mentee: Kathyrn Walter, Context: Kathryn is an undergraduate student under my direct supervision at Pitt. Achievements: Submitted a first author abstract to a national meeting.

2021-present Role: Research Mentor, Mentee: Sean Koerner, Context: Sean is a radiation oncology resident who spent his research year in my lab. Achievements: RSNA Resident Research Award - $30,000. He had 2 first author abstracts from my lab presented at international meetings.

2022 Role: Career Advice Mentor, Mentee: John Bryant, Context: Dr. Bryant was a resident at Moffit who was matched with me through the ASTRO Mentor Match Program. I met with him at several points to offer career, grant writing, and physician scientist job search advice.

2022 Role: Career Advice Mentor, Mentee: Jennifer Kwon, Context: Dr. Kwon was a resident at Princess Margaret Cancer Center who was matched with me through the ASTRO Mentor Match Program. I met with her at several points to offer career, grant writing, and physician scientist job search advice.

2022-2024 Role: Research Mentor, Mentee: Kathyrn Walter, Context: Kathryn is an undergraduate student under my direct supervision at Pitt. Achievements: presented a first author abstract to a national meeting. Now has a job in industry.

2023-present Role: Research Mentor, Mentee: Christina Raad, Context: Christina is an undergraduate student under my direct supervision at Pitt. Achievements: Learning skills in lab.

2023-present Role: Research Mentor, Mentee: Raseel Althawadi, Context: Raseel is a medical student from Ireland spending working on a clinical research project with my group. Achievements: Learning database skills.

2023-present Role: Peer Review Mentor, Mentee: Dr. Eric Vick, Context: Dr. Vick is a hematology oncology fellow at the University of Wisconsin. I'm his peer review mentor as part of the JITC peer review mentorship program.

2023-present Role: Postdoctoral Research Mentor, Mentee: Edmond Yaghoubian, Context: Edmond is an incoming radiation oncology resident who is completing a postdoctoral fellowship

in my lab prior to starting residency working on radiation oncology clinical research developing our Pluvicto database.

2023-present Role: Postdoctoral Research Mentor, Mentee: George Diehl, Context: George is a recent PhD graduate in the first year of his post doc working on a project with CAR T cell therapy and RPT in my lab.

Mentored grant funding

Welton Sophomore Honors Summer Apprenticeship – Mentor for Ryan Brown.
07/01/18 – 09/01/18

Wisconsin Hilldale Undergraduate/Faculty Research Fellowship – Mentor for Ryan Brown
07/01/18 – 06/31/19

Biochemistry Undergraduate Summer Research Award – Mentor for Luke Zangl
07/01/19 – 09/30/19

Wisconsin Hilldale Undergraduate/Faculty Research Fellowship – Mentor for Luke Zangl
07/01/19 – 06/31/19

Frederick Honors College Health Sciences Research Fellowship – Mentor for Abhay Sheeri
2022 - $4000

Radiological Society of North America Resident Research Award – Mentor for Sean Koerner
7/1/22-6/30/23 - $30,000

Frederick Honors College Health Sciences Research Fellowship – Mentor for Vignesh Elangovan
2023 - $4000

Other Media including Web based curriculum, podcasts, and broadcasts

7/14/2021 WTAE-TV interview aired on Patel Lab Research.

7/27/2021 KDKA-AM Radio Morning Show interview aired on Patel Lab Research.

2021 Medical Breakthrough TV series interview.

2023 UPMC Physician Journal on Theranostics Program led by Dr. Patel and Dr. Srinivas

2023 Excited By The Science by Edanz Podcast. S1Ep2 – Battling Breast Cancer with HIFU.

2023 PittMed August Issue article on Patel Lab Research

2024 Imaging Wire interview on Theranostics – 9/16/24

RESEARCH

Current Grant Support:

R01CA275766	Integrating VLA-4–targeted 67Cu-LLP2A radiotherapy to improve T-cell based adoptive immunotherapy	PI – 3.0 calendar months	7/5/23-6/30/28	$3,042,012
R01CA239041	Alpha-Particle Emitter Radiopharmaceutical Therapy for Liver Cancer	Co-I – 0.24 calendar months	12/1/21-11/30/24	$85,645
R21HD107802	Developing intrabody therapeutics for mitochondrial DNA heteroplasmy	Co-I – 0.24 calendar months	3/1/22-11/30/24	
MISP #59875 (HCC 20-300)	Phase II neoadjuvant study of PD-1 inhibitor pembrolizumab in PD-1 naive cutaneous squamous cell carcinoma (cSCC)	CEA Project PI – 0.24 Calendar months	3/1/21-2/28/26	$20,000
Pittsburgh Foundation	Interleukin-15 cytokine therapy enhances efficacy of combination radiation immune checkpoint blockade in Head and Neck Cancer	PI – 0.12 calendar months	1/1/24-12/31/24	$25,000

Pending Grant Support (Include status, date reviewed, and priority score)

R01CA299150	Targeting DNA damage repair to overcome	PI – 3.0 calendar months	4/1/25-3/31/60	$3,915,990

	immune resistance in head and neck cancer.			
R01	Targeting immune vulnerabilities generated by DNA damage in Ewing sarcoma	Co-I – 0.60 calendar months	9/1/24-8/31/29	

Prior Grant Support:

K08CA241319	Utilization of molecular targeted radioisotopes to prime immune responses at local and distant metastatic tumor sites	PI – 6.0 calendar months	7/1/19-6/30/24	$629,475
RSNA Research Fellow Award	Utilization of molecular targeted radiotherapy to enhance the efficacy of systemic dual checkpoint inhibition in preclinical metastatic cancer models.	PI – 9 calendar months	7/1/17-6/31/18	$50,000
ASCO Young Investigator Award	Determining the dosing and timing of systemic targeted radiation therapy with	PI – 9 calendar months	7/1/18-6/31/19	$50,000

	dual systemic checkpoint blockade			
R01CA214018	Image Guided Immunotherapy and Targeted Radionuclide Therapy of Metastatic Melanoma	Co-I – 0.30 calendar months	8/1/20-12/30/22	$63,070
P50CA97190	Head and Neck Cancer SPORE – Career Enhancement Award	Co-I – 0.24 calendar months	7/1/23-8/31/24	$79,500

Non-Funded Research:

- Clinical trials, IRB/Protocols, Studies

Clinical trials Currently Active

HCC 21-239 – NCT04071223 - A Phase II Randomized Trial of Radium-223 Dichloride and Cabozantinib in Patients With Advanced Renal Cell Carcinoma With Bone Metastasis (RADICAL)
Role – UPMC Site PI

HCC 22-003 – NCT03872778 - Phase I/IIa Trial of [177Lu]-NeoB in Patients with Advanced Solid Tumors and with [68Ga]-NeoB Lesion Uptake
Role – UPMC Site PI

HCC 22-048 – NCT05464667 - Preoperative Irradiation for Stage I Breast Cancer: A Phase IB Study
Role – Translational Science PI

HCC 23-088 – NCT04904120 - A Phase I/IIa, First-in-Human, Multicenter Dose Escalation and Dose Expansion Study of [203/212Pb]VMT01 Receptor-targeted, Image-guided Alpha-particle Therapy in Patients with Previously Treated Unresectable or Metastatic Melanoma
Role – UPMC Site PI

STUDY22110104 - Retrospective Analysis of Pluvicto Patients

Role - PI

Clinical trials Completed

HCC 20-273 – NCT04234568 - A Phase I Trial of Triapine and Lutetium Lu 177 Dotatate in Combination for Well-Differentiated Somatostatin Receptor-Positive Gastroenteropancreatic Neuroendocrine Tumors (GEP-NETs)
Role – UPMC Site PI

HCC 20-300 – NCT04808999 - Phase II neoadjuvant study of PD-1 inhibitor pembrolizumab in PD-1 naive cutaneous squamous cell carcinoma (cSCC)
Role – Rad Onc co-PI

Patents

P180331US01 Shaoquin Gong, Zachary Morris, Paul Sondel, Mingzhou Ye, Ravi Patel A bacterial membrane coated nanoparticle vaccine in combination with radiation therapy improves the anticancer efficacy and survival rate – Patent Awarded.

P180116US01 Reinier Hernandez, Zachary Morris, Paul Sondel, Jamey Weichert, Peter Carlson, Joe Grudinski, Ravi Patel. Using targeted radiotherapy to drive anti-tumor immune response to immunotherapies – Patent Awarded

Editorships

2020 – Present. Journal of Immunotherapy in Cancer – Associate Editor – Clinical Translational Science Section

Ad-hoc manuscript reviewer

Nature Communications
Applied Radiation Oncology
International Journal of Radiation Oncology, Biology, Physics
Journal of Immunotherapy of Cancer
Radiotherapy & Oncology
Radiation Research
Journal of Nuclear Medicine
Theranostics
PLOS ONE
International Journal of Pathology and Clinical Research
Frontiers in Immunology
Advances in Radiation Oncology

Grant reviewing

2019-Present ASTRO Resident/BCRF Grants/Fellowship

2021, 2023	RSNA Radiation Oncology Research Grants
2021,2022, 2023	DOD Ovarian Cancer Research Program Study Section Reviewer
2022, 2023	NIH CSR Cancer Nanotechnology Review Panel
2023	Dutch Cancer Society – External Grant Reviewer
2023	NIH: SEP-6. NCI Clinical and Translational R21 and Omnibus R03
2023-Present	SITC Fellowship grant reviews

LIST of CURRENT RESEARCH INTERESTS

1. My lab's current K08 is investigating the use of low dose targeted radionuclide therapy to enhance efficacy of immune checkpoint Blockade. We have found that low doses of radionuclide therapy can immunomodulate the tumor immune microenvironment and overcome immunotherapy resistance. We are currently working on strategies to improve this therapy.
2. Our recently awarded R01 proposal examines the use of VLA4 targeted radipharmaceutical therapy to enhance efficacy of adoptive T cell therapies. We hypothesize that ^{67}Cu-LLP2A will target immune cells and act as a conditioning agent for cellular therapies.
3. Our head and neck cancer career development award is examining the ability of a PDL1-IL15 dibody developed by our lab to enhance efficacy of radiation therapy in murine head and neck cancer models.
4. I have an active collaboration with Dr. Freddy Escorcia the NCI and a research agreement using his lab's GPC3 targeting scFvs. We have produced antibody fragments of for these scFvs and are testing the ability of these fragments to deliver immunomodulatory radiation to the TME. We have an R01 submitted on this project.
5. I have a clinical interest in radiopharmaceutical therapy and have an active clinical practice in this area. Our group is examining how radiopharmaceutical therapy dosimetry correlates with clinical outcomes. I have an active IRB protocol to study this question as well as an active research agreement with Voximetry which is a dosimetry software company.

INVITED SEMINARS AND LECTURESHIPS

2016 University Hospitals of Cleveland, Dept. of Radiation Oncology Grand Rounds: Feb 2016. Cleveland, OH. Local management of primary and secondary liver tumors: Current approaches and future perspectives

2017 University Hospitals of Cleveland, Dept. of Radiation Oncology Research Retreat: Jan 2017. Cleveland, OH. Using radiation to enhance the efficacy of immunostimulatory virus-like nanoparticles as an in situ tumor vaccine

2017 University Hospitals of Cleveland, Dept. of Radiation Oncology Grand Rounds: April 2017. Cleveland, OH. The role of radiation in conjunction with tumor directed immunotherapy treatments.

2018 Parkview Medical Center, Dept. of Medicine: June 2018. Pueblo, CO. SBRT for Early

Stage Lung Cancer

2018 ASTRO Annual Meeting. October 21, 2018. San Antonio, TX. Moderator. Session: Biology 2 - Radiation and Immune Response Session I

2018 University of Wisconsin Cancer Biology Seminar Series, November 14, 2018, Madison, WI. Combination radiation and immunotherapy: where we are now and future directions.

2019 University of Southern California Cancer Center Grand Rounds, January 29, 2019, Los Angeles, CA. Utilization of low dose radiation to enhance the efficacy of cancer immunotherapy and enhance abscopal responses.

2019 The Ohio State University, May 22, 2019, Columbus, OH. Development of translational radio-immuno-oncology treatment strategies.

2019 The University of Alabama Birmingham, June 14, 2019, Birmingham, AL Translational approaches for combination radiation immunotherapy treatment.

2019 The University of Pittsburgh, June 24, 2019, Pittsburgh, PA. Combinatory treatment strategies: Investigating the role of radiotherapy to augment efficacy of cancer immunotherapy treatment.

2019 Workshop on Radiobiology, Omics and Microdosimetry of Systemic and Targeted Radiotherapies, July 24, 2019. Oak Ridge, TN. Utilization targeted radionuclide therapy to enhance efficacy of cancer immunotherapy.

2019 ASTRO Annual Meeting. September 16, 2019. Chicago, IL. Moderator. Session: Biology 2 - Immune Biomarkers

2019 SITC Annual Meeting, Nov 08, 2019. National Harbor. Basic Science Rapid Oral Session – Co-chair

2019 SITC Annual Meeting, Nov 07, 2019. National Harbor. Meet the Expert Lunch Faculty – Tumor Immunology.

2019 RSNA Annual Meeting, Dec 05, 2019. Chicago, IL. Next Generation Approaches to Enhancing the Cooperative Interaction between Radiation and Immunotherapy

2020 RRS Winter Workshop, Mar 06, 2020. Big Sky, Mo. Antitumor immunomodulation through targeted radionuclide therapy.

2020 SITC Meet the Expert Webinar, Apr 16, 2020. Industry vs Academia – CV/Resume and Cover Letter Writing.

2020 ASRT Lecture Series, Aug 19, 2020, Virtual – Radiopharmaceutical Therapy

2020 ECOG-ACRIN Young Investigator Symposium, Oct 21, 2020, Virtual – Low dose systemic targeted radio- pharmaceutical therapy enhances efficacy of immune checkpoint blockade

2020 ASTRO Grant Writing Workshop, Oct 24, 2020, Virtual – Applying for Career Development Awards, Mock Reviewer, QA session faculty.

2020 SITC Annual Meeting, Nov 11, 2020. Virtual. Clinical Science Rapid Oral Session – Co-chair

2021 Joint Program in Nuclear Medicine at Brigham and Women's, October 21, 2021. Low-dose targeted radionuclide therapy renders immunologically cold tumors responsive to immune checkpoint blockade.

2021 SITC Annual Meeting, Nov 11, 2021. Grant Writing Workshop – Moderator and Faculty for Mock Study Section

2021 Hillman Cancer Immunology and Immunotherapy Program, Dec 15, 2021.– Utilization

of radiation therapy to enhance efficacy of immunotherapy treatments in resistant tumors

2022 Hillman Basic & Translational Research Seminar, March 08, 2022.– Low-dose Targeted Radionuclide Therapy Renders Immunologically Cold Tumors Responsive to Immune Checkpoint Blockade.

2022 ASTRO ROCKS, July 13, 2022.– Transitioning from Residency to K-Funded Physician-Scientist: Pathways to Success

2022 Multidisciplinary Head and Neck Cancer Care Conference and 5th New Horizons in Immunotherapy Conference, Sept 23 – Radionuclide Therapy and Immune Checkpoint Blockade.

2022 SNMMI: The role of PSMA Imaging and Therapy in Managing Prostate Cancer, Sept 8 – Radiation Oncologist's Perspective

2022 ABS: Toward Systemic Brachytherapy: Incorporating Radiopharmaceuticals into your Practice Symposium, Nov 8 – Focused Overview of Approved Agents, Indications, Trials, Dosimetry and Response Assessment, Roundtable Discussion with Faculty.

2022 SITC Annual Meeting, Nov 09, 2022. Grant Writing Workshop – Moderator and Faculty for Mock Study Section

2022 SITC Annual Meeting, Nov 10, 2022. Boston, MA. Next-Generation Approaches to the Delivering Radiation in Conjunction with Immunotherapy for Patients with Oligometastatic Disease.

2022 SITC Annual Meeting, Nov 11, 2022. Boston, MA. Clinical Science Rapid Oral Session – Co-chair

2022 ESMO Immuno-Oncology Congress, Dec 7, 2022. Geneva, SUI. Joint ESMO-SITC Immunotherapy Primer – The Utility of Radiographic Imaging and Radiotherapy in Immunotherapy.

2023 NRG Oncology – Winter Meeting, Jan 27, 2023. Orlando, FL. Translational Science Lung Cancer Working Group – Preclinical Rationale for New Radiation Immunotherapy Treatment Combinations.

2023 UPMC Radiation Oncology E-rounds, April 10, 2023, Pitt, PA. Skin Cancer – Discussion Leader

2023 MSKCC – Radiation Oncology Grand Rounds, April 12, 2023. NY, NY. Use of Low Dose Radiopharmaceutical Therapy to Enhance Efficacy of Immunotherapy in Resistant Tumors.

2023 AAPM/WMIS Symposium – July 26, 2023. Houston, TX. Delivering immunomodulatory radiation via radiopharmaceutical therapy to enhance efficacy of immune checkpoint blockade.

2023 WMIC – Sept 8th, 2023. Prague, CZH. Delivering immunomodulatory radiation via radiopharmaceutical therapy to enhance efficacy of immune checkpoint blockade.

2023 Forbeck Scholar Retreat – Oct 14th, 2023. Lake Geneva, WI. Delivering immunomodulatory radiation via radiopharmaceutical therapy to enhance efficacy of immune checkpoint blockade.

2023 SITC Grant Writing Workshop – Nov 2nd, 2023. San Diego, CA. Lead Organizer, Moderator, Breakout Table Faculty.

2024 NCI-IOTN-SITC-AAI Workshop on Combining Immunotherapy with Radiotherapy – Jan 16-17, 2024. Besthesda, MD. – Workgroup Leader.

2024 ACRO Radiation Oncology Virtual Education Rotation. Radiopharmaceuticals – Mar 1, 2024. Virtual – Invited Speaker.

2024 American Association of Cancer Research. Biomarkers and correlates to predict response to radiation immunotherapy combination treatment – Apr 10, 2024 – Invited Speaker.

2024 American Radium Society. GU Session Organizer and Moderator – May 2, 2024 – Invited Moderator

2024 American Radium Society. Special Session 4: Multidisciplinary Frontiers in Oncology: Radiopharmaceuticals, Theranostic Dosimetry, and Molecular Imaging. How can dosimetric evaluation can be used to alter clinical decision making in patients undergoing radiopharmaceutical therapy? – May 4, 2024 – Invited Speaker

2024 5th Annual Immuno-Oncology Symposium – Western University. Use of radiopharmaceutical therapy to overcome resistance to immunotherapy regimens. May 30, 2024 – Invited Speaker

2024 GE Healthcare Theranostics Leadership Summit – Orundsbro, Sweden. Fireside Chat on Patient Management. June 20, 2024 – Invited Panelist

2024 SNMMI Therapeutics Conference. Using a Multidisciplinary Approach to Establish a Translational Radiopharmaceutical Therapy Program. Sept 21, 2024 – Invited Speaker

2024 SNMMI Therapeutics Conference. Dosimetry-Informed Patient Management: A Practical Guide. Sept 21, 2024 – Invited Speaker

2024 Practical Elements of a Radiopharmaceutical Program: Findings from ASTRO's Safety White Paper. Quality Management for Radiopharmaceutical Therapy. Oct 1, 2024 – Invited Speaker

SERVICE

University and Medical School Service

2004-2012	CWRU MSTP Council -Social Chair (2008), Council President (2009)
2006-2007	CWRU Medical School Problem Based Learning Curriculum Development Committee Member
2007 – 2012	CWRU MSTP Admissions – Applicant Interviewer
2013 – 2014	UH Resident Education Funding Committee Member
2013 – 2017	University Hospitals of Cleveland House Staff Association –Chair (2014-17)
2015 - 2016	University Hospitals of Cleveland Resident Council Rad Onc Representative
2015 – 2017	University Hospitals of Cleveland Cancer IRB Member/Protocol Reviewer
2020– present	GU Tumor Board/GU Disease Team Member
2020– present	Dermatology Tumor Board/Melanoma and Sarcoma Disease Team Member
2021 –2022	HCC Radiation Oncology Dept. Research Development Committee Member
2021	HCC Retreat Poster Competition Judge
2021	HCC Retreat Round Table Discussant on K awards
2021	HCC Pilot Grant Reviewer
2021 – 2024	HCC Radiation Oncology Physician Peer Review Committee Member
2021 – present	HCC In vivo Imaging Facility Advisory Committee Member
2022	Radiation Oncology Residency Applicant Reviewer/Interviewer
2022–2023	UPSOM Radiation Oncology Promotions Committee

2022– present University of Pittsburgh Radiation Safety Committee, Human Use Subcommittee Member
2023– present Department of Radiation Oncology Website Development Committee Member
2023-present University of Pittsburgh Radiation Safety Committee, Theranostics Sub-Committee member.
2023– present Department of Radiation Oncology Translational Research Meeting Member
2023– present Molecular Pharmacy Advisory Committee Member
2023– present Department Retreat Planning Committee
2023– present Lead Organizer for Molecular Imaging Monthly Meeting
2024 HCC Strategic Planning Committee – Precision Oncology & Integrative Biology
2024– present Proctocol Review Committee – Alternate Reviewer
2024– present Data Safety Monitoring Committee - member

Local/Community Service Activities

2023 Rush to Crush Cancer Rider
2023 Oct 14, 2023 – Blue Jeans Ball
2024 Sept 28, 2024 – Blue Jeans Ball

Regional Service

Sept 8, 2022 SNMMI: Traveling Workshop - The role of PSMA Imaging and Therapy in Managing Prostate Cancer, Invited Educational Speaker
2023– present Novitas Solutions Contractor Advisory Committee – I was nominated by ASTRO to represent radiation oncology for our regional medicare contractor.

National Service

American Society for Radiation Oncology (ASTRO) Member

2016 – Present Member, Corporate Relations Committee
2018 – Present Member, ASTRO Annual Meeting Scientific Committee, Abstract Reviewer
2019 – Present Member, Research Grant Evaluation Sub-Committee
2019 – Present Member, Promoting Science through Research and Training Committee
2021 – Present Member, Code Utilization and Application Committee
2021 – Present Vice Chair (starting 2024), Research Funding Development Committee
2022 – Present Member, Radiopharma dosimetry coding workgroup
2022 – Present Reviewer/Editor, ASTRO Coding Resource
2022 – Present Member, ASTRO Mentorship Award Review Panel
2022 – 2023 ASTRO Peer Mentor
2022 – Present RPT Roundtable Participant
2023 – Present RPT Whitepaper

Society for Immunotherapy in Cancer (SITC)

2018 – 2021	Member, Sparkathon Class of 2018
2019 – Present	Member, Early Career Scientist Committee
2019 – 2020	Meet the Expert Lunch Organizing Committee
2020 – 2021	Early Career Networking Event Organizer
2021 – Present	Chair (2022-2023), SITC Grant Writing Workshop Organizer
2021 – Present	SITC Annual Meeting Abstract Reviewer
2021 – Present	JITC Peer Review Mentor
2023 – Present	Member, SITC Awards Review Committee

NRG Oncology

2022 – Present	Member, Developmental Therapeutics RT Subcommittee
2022 – Present	Member, Translational Science Committee
2022 – Present	Member, Immunotherapy Subcommittee
2022 – Present	Member, Genitourinary Committee

NRG Oncology

2022 – Present	Member, Developmental Therapeutics RT Subcommittee
2022 – Present	Member, Translational Science Committee
2022 – Present	Member, Immunotherapy Subcommittee
2022 – Present	Member, Genitourinary Committee

American Radium Society

2023 – Present	Annual Meeting Program Committee
2023 – Present	Annual Meeting Abstract Reviewer
2024 – Present	Unsealed Sources AUC Committee Member
2024 – Present	Co-leader of RPT for prostate cancer AUC

NIH

2022	Scientific Reviewer - NIH CSR Special Emphasis Panel, IMST-U (55)
2023	Scientific Reviewer - NIH CSR Special Emphasis Panel (MCST-U55 Cancer Nanotechnology)
2023	Scientific Reviewer - SEP-6: NCI Clinical and Translational R21 and Omnibus R03
2023 – Present	Alumni Advisory Board - NASDC course - Advanced Workshop on Research Skills in Oncology
2024	Scientific Reviewer – DP5 Grant Award Panel