

## Joshua M. Walker, M.D., Ph.D.

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### Education

- 2005-2013     **Medical Doctorate (M.D.)**  
Oregon Health & Science University School of Medicine, Portland, OR
- 2007-2011     **Philosophy Doctorate (Ph.D.)**  
Department of Molecular Microbiology & Immunology  
Oregon Health & Science University School of Medicine, Portland, OR  
Thesis Title:        Characterization of CD8+ T cells following vaccination with an inactivated whole virus vaccine  
Thesis Advisor:     Mark K. Slifka, Ph.D.
- 1996-2000     **Bachelor of Science (B.Sc.), *cum laude***  
Major: Biology  
Gonzaga University, Spokane, WA, USA

### Research Experience and Professional Positions

- 2018-present   **Assistant Professor**  
Department of Radiation Medicine, Department of Cell, Developmental & Cancer Biology, Oregon Health & Science University, Portland, OR
- 2017-2018     **Chief Resident & Instructor**  
Department of Radiation Medicine, Oregon Health & Science University, Portland, OR  
• Responsible for creating radiation biology curriculum for junior residents and directly teaching radiation oncology clinical coursework to junior residents and medical students
- 2014-2018     **Holman Pathway Resident: Radiation Oncology**  
Department of Radiation Medicine, Oregon Health & Science University, Portland, OR  
• Demonstrated the ability of radiotherapy in combination with costimulation and checkpoint inhibition to reverse tumor-associated T cell anergy  
• Responsible for training and educating summer students, graduate students, and technicians. Managed a technician that was funded from an ASCO Young Investigator Award as well as a RSNA Resident Research award.
- 2013-2014     **Intern: Internal Medicine**  
Providence St. Vincent Medical Center, Portland, OR,
- 2000-2005     **Senior Research Assistant**  
Louis J. Picker, M.D. Laboratory, Oregon Health & Science University, Portland, OR  
• Completed initial experiments using rhesus cytomegalovirus as a vector for expression of simian immunodeficiency virus (SIV) epitopes in the development of an SIV vaccine
- 1999           **Research Intern**  
Vernon C. Maino, Ph.D. Laboratory, BD Biosciences Corporation, San Jose, CA  
• Optimized immunological monitoring techniques used to monitor T cell based immunity in HIV infected patients

- 1999-2000     **Research Assistant**  
Peter Pauw, Ph.D. Laboratory, Gonzaga University, Spokane, WA  
• Researched the effects of ouabain inhibition on cell-cell fusion
- 1998           **Research Intern**  
Kent R. Myers Ph.D. Laboratory, Ribic Immunochem, Hamilton, MT  
• Assisted in development of TLR ligand preparations for use as vaccine adjuvants

## Licensures and certifications

- 2018-present   Oregon Medical License #: MD189059  
2018-present   DEA License: AE3309045-6337  
2017-present   American Board of Radiology: Clinical, Radiation Physics, & Radiation Biology Certification  
2013-present   National Provider Identification #: 19628486  
2007-2014      National Board of Medical Examiners Step I, Step II CS & CK, and Step III

## Awards and Honors

### Research Funding Support:

- 2019           **Hildegard Lamfrom Research Scholar Award: PI, \$100,000, current**  
OHSU Knight Cancer Institute
- 2017           **Young Investigator Award Recipient (11376): PI, \$50,000**  
Conquer Cancer Foundation of ASCO Endowed Young Investigator Award in memory of Sally Gordon  
"Restimulation of tumor-specific T cells using radiotherapy in a murine T cell anergy model"
- 2017           **ASTRO Seed Grant Recipient (534553): PI, \$25,000, awarded but declined\***  
The American Society for Radiation Oncology  
"The role of radiation in reversing tumor-associated T cell anergy"  
\*Grant declined due to duplicate aims and funding period with RSNA Resident Research grant (RR1767)
- 2017           **Resident Research Grant Recipient (RR1767): PI, \$30,000**  
Radiological Society of North America  
"Correlates of T Cell Activation in Mouse Radiotherapy Models"
- 2012           **Research Medical Student Grant Recipient (RMS1229): PI, \$3,000**  
Radiological Society of North America  
"Role of DAMPs (danger-associated molecular pattern) as Immune Activators in Combination SBRT and IL-2 Therapy of Metastatic Melanoma."
- 2011           **N.L. Tartar Trust Fellowship Recipient: \$2,000**  
Oregon Health & Science University
- 2010           **Dermatology T32 Training Grant Recipient (T32-CA106195)**  
Oregon Health & Science University
- 2009           **Immunology T32 Training Grant Recipient (T32 AI078903)**  
Oregon Health & Science University

**Service and Awards:**

- 2021      **Grants Committee Member**  
The American Society for Radiation Oncology
- 2021      **Education Committee Member**  
The American Society for Radiation Oncology
- 2020      **OHSU Cell Developmental & Cancer Biology Qualifying Committee**  
Oregon Health & Science University
- 2020      **Grants Committee Member**  
The American Society for Radiation Oncology
- 2020      **Education Committee Member**  
The American Society for Radiation Oncology
- 2019      **Grants Committee Member**  
The American Society for Radiation Oncology
- 2019      **Education Committee Member**  
The American Society for Radiation Oncology
- 2018      **RSNA Rotengen Resident Research Award Recipient**
- 2018      **Inducted into Alpha Omega Alpha Honor Society**
- 2018      **Reviewer: JAMA Oncology**
- 2017      **Planning Committee Member and Small Group Moderator**  
ASTRO SITC Immunotherapy Workshop
- 2017      **Chief Resident, 2017-2018 academic year**  
Department of Radiation Medicine, Oregon Health & Science University
- 2017      **Advocacy Day Travel Grant Recipient**  
The American Society for Radiation Oncology
- 2017      **ACR Executive Committee Radiation Oncology Representative Candidate**  
The American College of Radiology
- 2016      **ASCO/AACR Methods in Clinical Cancer Research Workshop**  
The American Society for Clinical Oncology, Vail Course
- 2016      **Chief Resident, 2016-2018 academic year**  
Department of Radiation Medicine, Oregon Health & Science University
- 2016      **Advocacy Day Travel Grant Recipient**

The American Society for Radiation Oncology

- 2012      **Rubinstein Research Scholar**  
Department of Radiation Medicine, Oregon Health & Science University
- 2010      **Outstanding Oral Presentation**  
Oregon Health & Science University Student Research Forum
- 2009      **Vice President Graduate Student Organization**  
Oregon Health & Science University

## Bibliography

### Research Articles:

1. Ambady P, Wu YJ, Kersch CN, Walker JM, Holland, S, Muldoon LL, Neuwelt EA. Radiation enhances delivery of antisense oligonucleotides and improves chemo-radiation efficacy in brain tumor xenografts. **Cancer Gene Therapy**. Submitted
2. Walker JM, Rolig AS, Charych DH, Hoche U, Kasiewicz MJ, Rose DC, McNamara MJ, Hilgart-Martiszus IF, Redmond WL. NKTR-214 immunotherapy synergizes with radiotherapy to stimulate systemic CD8+ T cell responses capable of curing multi-focal cancer. **Journal for Immunotherapy of Cancer**. 2020. PMID: 32457127.
3. Walker JM., Loo B. Radiotherapy and Immunotherapy—Shining Further Together. **JAMA Oncology**. 2019. PMID: 31294751.
4. Murphy B, Walker JM, Bassale S, Monaco D, Jaboin J, Ciporen J, Taylor M, Kubicky C. Concurrent Radiosurgery and Immune Checkpoint Inhibition. **American Journal of Clinical Oncology**. 2019. PMID: 30557166.
5. Mariscano AE, Walker JM, McGee HM, Kim MM, Kunos CA, Monjazez AM, Shiao SL, Tran PT, Ahmed MM. Incorporating Radiation Oncology into Immunotherapy: Proceedings from the ASTRO-SITC-NCI Immunotherapy Workshop. **Journal for Immunotherapy of Cancer**. 2018. PMID: 29375032.
6. Ambady P, Wu YJ, Walker JM, Kersch C, Pagel M, Woltjer R, Fu R, and Muldoon L, Neuwelt E. Enhancing the Cytotoxicity of Chemo-Radiation with Radiation-Guided Delivery of Anti-MGMT Morpholino Oligonucleotides in non-methylated Solid Tumors. **Cancer Gene Therapy**. 2017. PMID: 28752860.
7. Verma V, Simone CB, Allen PK, Gajjar SR, Shah C, Zhen W, Harkenrider MM, Hallemeier CL, Jabbour SK, Matthiesen CL, Braunstein SE, Lee P, Dilling TJ, Allen BG, Nichols EM, Attia A, Zeng J, Biswas T, Paximadis P, Wang F, Walker JM, Stahl J, Daly ME, Decker RH, Hales RK, Willers H, Videtic GM, Mehta MP, Lin SH. Multi-Institutional Experience of Stereotactic Ablative Radiation Therapy for Stage I Small Cell Lung Cancer. **Int J Radiat Oncol Biol Phys**. 2017. PMID: 28011047.
8. Verma V, Shostrom VK, Kumar SS, Zhen W, Hallemeier CL, Braunstein SE, Holland JM, Harkenrider MM, Iskhanian AS, Neboori HJ, Jabbour SK, Attia A, Lee P, Alite F, Walker JM, Stahl JM, Wang K, Bingham BS, Hazitheodorou C, Decker RH, McGarry RC, Simone CB. Multi-institutional experience of stereotactic body radiotherapy for large (≥5 centimeters) non-small cell lung tumors. **Cancer**. 2017. PMID: 27741355.
9. Walker JM, Elliott DA, Kubicky CD, Thomas CR. Manufacture and evaluation of 3D printed sizing tools for use during intraoperative breast brachytherapy. **Advances in Radiation Oncology**. 2016. PMID: 28740881.
10. Meyer C, Walker JM; Dewane J, Engelmann F, Laub W, Pillai S Thomas CR; Messaoudi I. Impact of irradiation and immunosuppressive agents on immune system homeostasis in rhesus macaques. **Clin Exp Immunol**. 2015. PMID: 25902927.
11. Curti B, Kovacsovics-Bankowski M, Morris N, Walker EB, Chisholm L, Floyd K, Walker JM, Gonzalez I, Meeuwssen T, Fox B, Moudgil T, Miller W, Haley D, Coffey T, Fisher B, Delanty-Miller L, Rymarchyk N, Kelly

- T, Crocenzi T, Bernstein E, Sanborn R, Urba W, and Weinberg A. OX40 is a potent immune-stimulating target in late-stage cancer patients. **Cancer Research**. 2013. PMID: 24177180
12. Meyer C, Kerns A, Haberthur K, Dewane J, Walker JM, Gray WL, Messaoudi I. Attenuation of the adaptive immune response in rhesus macaques infected with simian varicella virus lacking open reading frame 61. **Journal of virology**. 2012. PMID: 23221560.
  13. Walker JM, Raué HP, Slifka MK. Characterization of CD8+ T cell function and immunodominance generated with an H2O2-inactivated whole virus vaccine. **Journal of virology**. 2012. PMID: 23055558.
  14. Okoye A, Park H, Rohankhedkar M, Coyne-Johnson L, Lum R, Walker JM, Planer SL, Legasse AW, Sylwester AW, Piatak M, Lifson JD, Sodora DL, Villinger F, Axthelm MK, Schmitz JE, Picker LJ. Profound CD4+/CCR5+ T cell expansion is induced by CD8+ lymphocyte depletion but does not account for accelerated SIV pathogenesis. **J Exp Med**. 2009. PMID: 19546246.
  15. Walker JM, Slifka MK. 2008. The immunostimulatory power of acute viral infection. **Immunity**. 2008. PMID: 18482565.
  16. Price DA, Bitmansour AD, Edgar JB, Walker JM, Axthelm MK, Douek DC, Picker LJ. Induction and Evolution of Cytomegalovirus-Specific CD4+ T Cell Clonotypes in Rhesus Macaques. **J Immunol**. 2008. PMID: 18097028.
  17. Okoye A, Meier-Schellersheim M, Brenchley JM, Hagen SI, Walker JM, Rohankhedkar M, Lum R, Edgar JB, Planer SL, Legasse A, Sylwester AW, Piatak M, Lifson JD, Maino VC, Sodora DL, Douek DC, Axthelm MK, Grossman Z, Picker LJ. Progressive CD4+ central memory T cell decline results in CD4+ effector memory insufficiency and overt disease in chronic SIV infection. **J Exp Med**. 2007. PMID: 17724130.
  18. Weinberg AD, Thalhofer C, Morris N, Walker JM, Seiss D, Wong S, Axthelm MK, Picker LJ, Urba WJ. Anti-OX40 (CD134) administration to nonhuman primates: immunostimulatory effects and toxicokinetic study. **J Immunother**. 2006. PMID: 17063120.
  19. Picker LJ, Hagen SI, Lum R, Reed-Inderbitzin EF, Daly LM, Sylwester AW, Walker JM, Siess DC, Piatak M, Wang C, Allison DB, Maino VC, Lifson JD, Kodama T, Axthelm MK. Insufficient production and tissue delivery of CD4+ memory T cells in rapidly progressive simian immunodeficiency virus infection. **J Exp Med**. 2004. PMID: 15545355.
  20. Pitcher CJ, Hagen SI, Walker JM, Lum R, Mitchell BL, Maino VC, Axthelm MK, Picker LJ. Development and homeostasis of T cell memory in rhesus macaque. **J Immunol**. 2002. PMID: 11751943.
  21. Ghanekar SA, Stranford SA, Ong JC, Walker JM, Maino VC, Levy JA. Decreased HIV-specific CD4 T cell proliferation in long-term HIV-infected individuals on antiretroviral therapy. **AIDS**. 2001. PMID: 11579254.
  22. Nomura LE, Walker JM, Maecker HT. Optimization of whole blood antigen-specific cytokine assays for CD4(+) T cells. **Cytometry**. 2000. PMID: 10754518.

### Book Chapters and Theses:

1. Walker JM. Characterization of CD8+ T cells following vaccination with an inactivated whole virus vaccine: a dissertation. 2011. Oregon Health & Science University Library.
2. Walker JM and Slifka MK. Longevity of CD8 T Cell Memory Following Acute Viral Infection. Zanetti M and Schoenberger SP, **Memory T Cells**. 2010. PMID: 20795543.
3. Walker JM, Maecker HT, Maino VC, Picker LJ. Multicolor flow cytometric analysis in SIV-infected rhesus macaque. **Methods Cell Biol**. 2004. PMID: 15603441.

### Patents:

1. Curti B, Kovacsovics-Bankowski M, Walker EB, Walker JM, Weinberg A. Cancer treatment and monitoring methods using OX40 agonists. United States. Providence Health and Services. US Patent number: \_\_\_\_\_

### Oral Presentations and Posters:

1. Walker JM, Kasiewicz MJ, Redmond WL. Combination radiotherapy and aOX40/aCTLA-4 immunotherapy reverses anergy and prevents development of functional exhaustion within tumor-specific CD8 T cells. SITC 32nd Annual Meeting, 2017.
2. Walker JM, McNamara MJ, Kasiewicz MJ, Hilgart-Martiszus I, Hoch U, Charych DH, Redmond WL. Combination of NKTR-214 and radiotherapy to reverse anergy and expand tumor-specific CD8 T Cells. SITC 32nd Annual Meeting, 2017.
3. Walker JM, Mick CL, Kasiewicz MJ, Redmond WL. Radiotherapy in combination with  $\alpha$ OX40 and  $\alpha$ CTLA-4 immunotherapy reverses anergy and prevents development of functional exhaustion within tumor-specific CD8 T cells. ASTRO 59th Annual Meeting, 2017, oral presentation.
4. Walker JM, Mick CL, Kasiewicz MJ, Redmond WL. The role of radiotherapy in reversing tumor-associated T cell anergy and exhaustion. Small Animal Radiation Research Platform User's Group Symposium, Oral Presentation, 2017.
5. Walker JM, Mick CL, Kasiewicz MJ, Redmond WL. Radiotherapy in combination with  $\alpha$ OX40 and  $\alpha$ CTLA-4 immunotherapy is capable of both preventing and reversing functional exhaustion within tumor-specific CD8 T cells. Keystone Meeting: Cancer Immunology and Immunotherapy: Taking a Place in Mainstream Oncology (C7), 2017.
6. Walker JM, Barragan DM, Kasiewicz MJ, Redmond WL. Alpha-Tocopheryloxyacetic Acid (aTEA) Immunomodulation Synergizes with Radiation Therapy to Treat Primary and Metastatic Murine Mammary Carcinoma. ASTRO 58th Annual Meeting, 2016.
7. Walker JM. Radioimmunotherapy for unresectable hepatocellular carcinoma. Clinical trial concept presentation SWOG Fall Meeting, 2016.
8. Walker JM, Barragan DM, Kasiewicz MJ, Redmond WL. Abstract 1664: Alpha-tocopheryloxyacetic acid (aTEA) induced immune activation synergizes with radiation therapy to treat primary and metastatic murine mammary carcinoma. AACR 107th Annual Meeting, 2016.
9. Walker JM, Holland JM, Deffebach M, Mongou-Tchkote S, Tanyi JA, Thomas CR, Dai Kubicky C. Outcomes of Hypofractionation for Early Stage and Locally Recurrent Non-Small Cell Lung Cancer: Experience from a Multidisciplinary Thoracic Oncology Program at a NCI Designated Cancer Center. ASTRO 57th Annual Meeting, 2015.
10. Walker JM, Thomas CR, Dewane J, Haberthur K, Pillai S, Laub W, Messaoudi I. Effects of Total Body Irradiation on T-Cell and B-Cell Subsets as Well as Macrophage in Rhesus Macaque. ASTRO 54th Annual Meeting, 2012.
11. Walker JM, Raué HP, Slifka MK. Analysis of CD8+ T cell responses following vaccination with live or H2O2 inactivated LCMV. Viral Immunity Keystone Symposium, 2010.
12. Walker JM, Raué HP, Slifka MK. Characterization of CD8+ T cell responses following LCMV vaccination. OHSU Student Research Forum, 2010.
13. Bitmansour AD, Edgar JB, Walker JM, Douek DC, Picker LJ. Clonotypic Structure of the CD4+ T Cell Response to RhCMV in Rhesus Macaque. 22nd Annual Symposium on Nonhuman Primate Models for AIDS, 2004.
14. Edgar JB, Hansen SG, Buxton K, Walker JM, Axthelm MK, Barry PA, Wong SW, Nelson JA, Picker LJ. Rhesus CMV can re-infect fully immune hosts and elicit de novo immune responses to vectored neoantigen. 22nd Annual Symposium on Nonhuman Primate Models for AIDS, 2004.
15. Strelow L, Hagen SG, Buxton K, Leid J, Edgar JB, Walker JM, Legasse A, Axthelm MK, Barry PA, Picker

- LJ, Nelson JA, Wong SW. Evidence of CMV re-infection in a sero-positive host. 21st Annual Symposium on Nonhuman Primate Models for AIDS, 2003.
16. Edgar JB, Walker JM, Bitmansour A, Strelow L, Nelson JA, Axthelm MK, Picker LJ. T-Cell Homeostasis During Experimental Rhesus Cytomegalovirus Primary and Reinfection. 20th Annual Symposium on Nonhuman Primate Models for AIDS, 2002.
17. Lum R, Walker JM, Hagen SI, Wong SW, Axthelm MK, Picker LJ. Frequencies of functional RhCMV- and SIV-specific memory T cells in peripheral blood do not reflect the representation of these cells within lymphoid tissues and extralymphoid effector sites. 19th Annual Symposium on Nonhuman Primate Models for AIDS, 2001.