CURRICULUM VITAE

Jennifer Ann Foltz, B.S., M.S., PhD

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PROFILE

ADRESS and TELEPHONE NUMBERS:
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PRESENT POSITION: (7/1/24-present) Assistant Professor-Investigator Track, Washington University School of Medicine, Division of Oncology, Section of Computational Biology, Department of Medicine, St. Louis, MO

EDUCATION:

2006-2010	B.S. (with Distinction) in Psychology, French Minor, Indiana University Purdue University Indianapolis (IUPUI)
2011-2012	M.S. in Cellular & Integrative Physiology, Indiana University School of Medicine, Mentor: Richard Gregory, PhD.
2012-2017	PhD in Immunology, University of Texas MD Anderson Cancer Center UTHealth Graduate School of Biomedical Sciences, Mentor: Dean A. Lee, MD., PhD.

PROFESSIONAL TRAINING

2008-2009	Research Assistant, Assertive Community Treatment Center Integrated Dual Disorders Treatment, Indianapolis, Indiana, USA
2009-2010	Capstone Honors Independent Research Project: Companion Animal's Effect on Children's Theory of Mind Understanding, Advisor: Kathy Johnson PhD., Indiana University Purdue University-Indianapolis (IUPUI), Indianapolis, Indiana USA.
8/2017-10/2018	Postdoctoral Fellow, The Research Institute at Nationwide Children's Hospital, Mentor: Dean A. Lee, MD, PhD
11/2018-6/2022	Postdoctoral Scholar, Washington University School of Medicine, Division of Oncology, Section of Stem Cell Biology, Saint Louis, MO, Mentor: Todd A. Fehniger, MD, PhD; co-mentor: Allegra A. Petti, PhD

ACADEMIC POSITIONS/EMPLOYMENT:

7/2016-8/2017	Research Associate, The Research Institute at Nationwide Children's Hospital, Columbus, Ohio, USA
2022-2023	Instructor, Washington University School of Medicine, Division of Oncology, Section of Computational Biology, Department of Medicine, St. Louis, MO
2023-2024	Assistant Professor-Research Track, Washington University School of Medicine, Division of Oncology, Section of Computational Biology, Department of Medicine, St. Louis, MO
2024-present	Assistant Professor-Investigator Track, Washington University School of Medicine, Division of Oncology, Section of Computational Biology, Department of Medicine, St. Louis, MO

UNIVERSITY AND HOSPITAL APPOINTMENTS AND COMMITEES:

2024-present Faculty Committee Chair, Mentorship to Enhance Diversity in Academia Program (MEDA), Washington University School of Medicine

HONORS AND AWARDS:

2006, 2008-2009 Academic Excellence Scholarship
2006-2009 Outstanding Freshman Scholarship Award
2006-2007 Incentive Award- Beginning Students
2006-2007 Dean's List
2007-2010 Scholar's List
2008 Sam H. Jones Community Service Scholar
2008 Reynolds Scholarship
2009-2010 Chancellor's Scholarship
2010 Top 100 Student
2010 Graduation Incentive Grant
2010 William Loye Bryan Scholar
2012 Graduate Oral Poster Presentation Finalist, Indiana University School of Dentistry Research Day
2012 Education Enhancement Grant, Gradate & Professional Student Government, IUPUI
2012 Travel Fellowship Award, Graduate Office, IUPUI
2015, 2016 Graduate School of Biomedical Sciences Travel Grant, UT MDACC
2015 2nd Place Poster Presentation, Immunology Program Retreat, UT MDACC
2016 Travel Award, Immunology Program, MD Anderson Cancer Center
2016 1st Place Poster Presentation, Nationwide Children's Hospital, Research Retreat
2018 Young Investigator Travel Award, Pediatric Blood & Marrow Transplant Consortium at American Society for Pediatric Hematology & Oncology Conference
2019-2020 T32 Training Grant in Molecular Hematology (T32HL007088-44)
2020 American Association of Immunologists (AAI) Trainee Abstract Award
2020 AAI Trainee Travel Award
2020-2022 NIH Loan Repayment Program, NCI, Clinical Research
2021-2022 T32 Training Grant in Genomic Medicine (1T32GM139799), NIH Section; NIGMS
2021 American Society of Hematology Abstract Achievement Award
2022 Society for Leukocyte Biology Presidential Scholar 1st Place
2023 SITC Women in Cancer Immunotherapy Network (WIN) Leadership Institute Program Acceptance
2022-2024 NIH Loan Repayment Program, NCI, Clinical Research, Renewal

EDITORIAL RESPONSIBILITIES:

2018-present Reviewer, Frontiers in Immunology
2022-present Reviewer, Cell Reports
2022-present Reviewer, Journal of Leukocyte Biology
2023-present Reviewer, Blood Advances

PROFESSIONAL SOCIETIES AND ORGANIZATIONS:

2015-present Society for Natural Immunity
2022-2023 Society for Leukocyte Biology; SLB 2022 Session Co-Chair: Omics in Leukocyte Biology

MAJOR INVITED PROFESSORSHIPS AND LECTURESHIPS:

2018 6th Annual Pediatric Blood & Marrow Transplant Consortium (PBMTC) at the American Society for Pediatric Hematology & Oncology (ASPHO) Meeting, Pittsburgh, Pennsylvania; *Chronic TGF-beta Stimulation of NK Cells During Activation by Tumor Targets Leads to Epigenetic and Transcriptional Reprogramming Toward Cytokine Hypersecretion*

2020 The American Association of Immunologists (AAI) Annual Meeting, Honolulu, HI; *The IL-15 receptor agonist N-803 combined with the anti-CD20 monoclonal antibody rituximab expands NK and CD8 T cells and alters single cell immune transcriptomes in a phase 1 clinical trial in lymphoma*, May 2020, *cancelled due to COVID-19

2021 Cold Springs Harbor Laboratory Single Cell Analyses Meeting, Virtual; *Identification of cytokine-induced memory-like natural killer cells in leukemia patients after adoptive transfer using CITE-seq*, November 2021

2021 *scRNA-seq for Immunologists Workshop*, Washington University School of Medicine

2021-2023 *scRNA-seq User Group*, co-lead with Drs. Reyka Jayasinghe & Jessica Silva-Fisher, Washington University School of Medicine

2022-2023 Bioinformatics Workshop, Washington University School of Medicine, *scRNA-seq*

2022 Society for Leukocyte Biology Annual Meeting, Waikoloa Village, HI; *Memory-like NK cells have distinct effector and persistence signatures*, October, 27, 2022

2024 Single cell and Spatial Analysis Symposium by McDonnell Genome Institute & 10x Genomics; *CITE-seq reveals the formation of unique human NK cell memory programs by IL-12/15/18*, April 19, 2024.

CONSULTING RELATIONSHIPS AND BOARD MEMBERSHIPS:

8/2022-present Cancer Prevention and Research Institute of Texas, Reviewer

2/2024-present WUGEN, Inc, Consultant on scRNA-seq

PATENTS:

2015 Co-Inventor, mouse anti-canine NKp46 antibody (clone 48A), Licensed to EMD Millipore for commercial resale (2018, Cat: MABF2109)

2018 Co-Inventor, pending patent: Transforming-Growth Factor Beta-Resistant Natural Killer Cells (USPTO: 16/966,367), Licensed to Kiadis

2019 Co-Inventor, pending patent: Overcoming immune suppression with TGFB Resistant NK cells (USPTO: 63/018,108), Licensed to Kiadis

TEACHING TITLE AND RESPONSIBILITIES:

2010 Teaching Assistant for Cognition, IUPUI, Indianapolis, IN, USA

2015 Graduate Teaching Assistant for Immunology 3, MD Anderson Cancer Center, Houston, Texas, USA

2023-present *scRNA-seq Workshop (2 Parts)*, Applied Bioinformatics for Genomics, Washington University School of Medicine. This course consisted of graduate students, postdoctoral fellows, and staff.

2023 *Single cell Transcriptomics*, Genomics in Medicine Seminar Series, Washington University School of Medicine

BIBLIOGRAPHY

1. **Foltz JA**, Somanchi SS, Yang Y, Aquino-Lopez A, Bishop EE, Lee DA. NCR1 Expression Identifies Canine Natural Killer Cell Subsets with Phenotypic Similarity to Human Natural Killer Cells. Front Immunol. 2016;7:521. doi: 10.3389/fimmu.2016.00521. eCollection 2016. PubMed PMID: 27933061; PubMed Central PMCID: PMC5120128.

2. Canter RJ, Grossenbacher SK, **Foltz JA**, Sturgill IR, Park JS, Luna JI, Kent MS, Culp WTN, Chen M, Modiano JF, Monjazeb AM, Lee DA, Murphy WJ. Radiotherapy enhances natural killer cell cytotoxicity and localization in pre-clinical canine sarcomas and first-in-dog clinical trial. J Immunother Cancer. 2017 Dec 19;5(1):98. doi: 10.1186/s40425-017-0305-7. PubMed PMID: 29254507; PubMed Central PMCID: PMC5735903.

3. Naeimi Kararoudi M, Dolatshad H, Trikha P, Hussain SA, Elmas E, **Foltz JA**, Moseman JE, Thakkar A, Nakkula RJ, Lamb M, Chakravarti N, McLaughlin KJ, Lee DA. Generation of Knock-out Primary and Expanded Human NK Cells Using Cas9 Ribonucleoproteins. J Vis Exp. 2018 Jun 14;(136). doi: 10.3791/58237. PubMed PMID: 29985369; PubMed Central PMCID: PMC6101749.

4. Schafer JR, Salzillo TC, Chakravarti N, Kararoudi MN, Trikha P**, Foltz JA**, Wang R, Li S, Lee DA. Education-dependent activation of glycolysis promotes the cytolytic potency of licensed human natural killer cells. J Allergy Clin Immunol. 2019 Jan;143(1):346-358.e6. doi: 10.1016/j.jaci.2018.06.047. Epub 2018 Aug 7. PubMed PMID: 30096390.

5. **Foltz JA**, Moseman JE, Thakkar A, Chakravarti N, Lee DA. TGFβ Imprinting During Activation Promotes Natural Killer Cell Cytokine Hypersecretion. Cancers (Basel). 2018 Nov 5;10(11). doi: 10.3390/cancers10110423. PubMed PMID: 30400618; PubMed Central PMCID: PMC6267005.

6. Judge SJ, Yanagisawa M, Sturgill IR, Bateni SB, Gingrich AA, **Foltz JA**, Lee DA, Modiano JF, Monjazeb AM, Culp WTN, Rebhun RB, Murphy WJ, Kent MS, Canter RJ. Blood and tissue biomarker analysis in dogs with osteosarcoma treated with palliative radiation and intra-tumoral autologous natural killer cell transfer. PLoS One. 2020;15(2):e0224775. PubMed PMID: 32084139; PubMed Central PMCID: PMC7034869.

7. Moseman JE, **Foltz JA**, Sorathia K, Heipertz EL, Lee DA. Evaluation of serum-free media formulations in feeder cell-stimulated expansion of natural killer cells. Cytotherapy. 2020 Jun;22(6):322-328. doi: 10.1016/j.jcyt.2020.02.002. Epub 2020 Apr 8. PubMed PMID: 32278551.

8. Wagner JA, Wong P, Schappe T, Berrien-Elliott MM, Cubitt C, Jaeger N, Lee M, Keppel CR, Marin ND, **Foltz JA**, Marsala L, Neal CC, Sullivan RP, Schneider SE, Keppel MP, Saucier N, Cooper MA, Fehniger TA. Stage-Specific Requirement for Eomes in Mature NK Cell Homeostasis and Cytotoxicity. Cell Rep. 2020 Jun 2;31(9):107720. doi: 10.1016/j.celrep.2020.107720. PubMed PMID: 32492428; PubMed Central PMCID: PMC7265846.

9. Berrien-Elliott MM, Cashen AF, Cubitt CC, Neal CC, Wong P, Wagner JA, Foster M, Schappe T, Desai S, McClain E, Becker-Hapak M, **Foltz JA**, Cooper ML, Jaeger N, Srivatsan SN, Gao F, Romee R, Abboud CN, Uy GL, Westervelt P, Jacoby MA, Pusic I, Stockerl-Goldstein KE, Schroeder MA, DiPersio J, Fehniger TA. Multidimensional Analyses of Donor Memory-Like NK Cells Reveal New Associations with Response after Adoptive Immunotherapy for Leukemia. Cancer Discov. 2020 Dec;10(12):1854-1871. doi: 10.1158/2159-8290.CD-20-0312. Epub 2020 Aug 21. PMID: 32826231; PMCID: PMC7710923.

10. **Foltz JA**, Hess BT, Bachanova V, Bartlett NL, Berrien-Elliott MM, McClain E, Becker-Hapak M, Foster M, Schappe T, Kahl B, Mehta-Shah N, Cashen AF, Marin ND, McDaniels K, Moreno C, Mosior M, Gao F, Griffith OL, Griffith M, Wagner JA, Epperla N, Rock AD, Lee J, Petti AA, Soon- Shiong P, Fehniger TA. Phase I Trial of N-803, an IL15 Receptor Agonist, with Rituximab in Patients with Indolent Non-Hodgkin Lymphoma. Clin Cancer Res. 2021 Jun 15;27(12):3339-3350. doi: 10.1158/1078-0432.CCR-20-4575. Epub 2021 Apr 8. PMID: 33832946; PMCID: PMC8197753.

11. Marin ND, Krasnick BA, Becker-Hapak M, Conant L, Goedegebuure SP, Berrien-Elliott MM, Robbins KJ, **Foltz JA**, Foster M, Wong P, Cubitt CC, Tran J, Wetzel CB, Jacobs M, Zhou AY, Russler-Germain D, Marsala L, Schappe T, Fields RC, Fehniger TA. Memory-like Differentiation Enhances NK Cell Responses to Melanoma. Clin Cancer Res. 2021 Sep 1;27(17):4859-4869. doi: 10.1158/1078-0432.CCR-21-0851. Epub 2021 Jun 29. PMID: 34187852; PMCID: PMC8416927.

12. Trikha P, Moseman JE, Thakkar A, Campbell AR, Elmas E, **Foltz JA**, Chakravarti N, Fitch JR, Mardis ER, Lee DA. Defining the AHR-regulated transcriptome in NK cells reveals gene expression programs relevant to development and function. Blood Adv. 2021 Nov 23;5(22):4605-4618. doi: 10.1182/bloodadvances.2021004533. PMID: 34559190; PMCID: PMC8759121.

13. Bednarski JJ, Zimmerman C, Berrien-Elliott MM, **Foltz JA**, Becker-Hapak M, Neal CC, Foster M, Schappe T, McClain E, Pence PP, Desai S, Kersting-Schadek S, Wong P, Russler-Germain DA, Fisk B, Lie WR, Eisele J, Hyde S, Bhatt ST, Griffith OL, Griffith M, Petti AA, Cashen AF, Fehniger TA. Donor memory-like NK cells persist and induce remissions in pediatric patients with relapsed AML after transplant. Blood. 2022 Mar 17;139(11):1670-1683. doi: 10.1182/blood.2021013972. PMID: 34871371; PMCID: PMC8931511.

14. Berrien-Elliott MM†, **Foltz JA**†, Russler-Germain DA†, Neal CC, Tran J, Gang M, Wong P, Fisk B, Cubitt CC, Marin ND, Zhou AY, Jacobs MT, Foster M, Schappe T, McClain E, Kersting-Schadek S, Desai S, Pence P, Becker-Hapak M, Eisele J, Mosior M, Marsala L, Griffith OL, Griffith M, Khan SM, Spencer DH, DiPersio JF, Romee R, Uy GL, Abboud CN, Ghobadi A, Westervelt P, Stockerl-Goldstein K, Schroeder MA, Wan F, Lie WR, Soon-Shiong P, Petti AA, Cashen AF*, Fehniger TA*. Hematopoietic cell transplantation donor-derived memory-like NK cells functionally persist after transfer into patients with leukemia. Sci Transl Med. 2022 Feb 23;14(633):eabm1375. doi: 10.1126/scitranslmed.abm1375. Epub 2022 Feb 23. PMID: 35196021. †denotes co-first authors, *co-corresponding authors

15. Cubitt CC, McClain E, Becker-Hapak M, **Foltz JA**, Wong P, Wagner JA, Neal CC, Marin ND, Marsala L, Foster M, Schappe T, Soon-Shiong P, Lee J, Berrien-Elliott MM, Fehniger TA. A novel fusion protein scaffold 18/12/TxM activates the IL-12, IL-15, and IL-18 receptors to induce human memory-like natural killer cells. Mol Ther Oncolytics. 2022 Feb 15;24:585-596. doi: 10.1016/j.omto.2022.02.009. PMID: 35284622; PMCID: PMC8889352.

16. Scorza BM, Mahachi KG, Cox AD, Toepp AJ, Pessoa-Pereira D, Tyrrell P, Buch J, **Foltz JA**, Lee D, Petersen CA. Role of NK-Like $CD8^+$ T Cells during Asymptomatic Borrelia burgdorferi Infection. Infect Immun. 2022 May 19;90(5):e0055521. doi: 10.1128/iai.00555-21. Epub 2022 Apr 13. PMID: 35416707; PMCID: PMC9119074.

17. Shrestha N, Chaturvedi P, Zhu X, Dee MJ, George V, Janney C, Egan JO, Liu B, Foster M, Marsala L, Wong P, Cubitt CC, **Foltz JA**, Tran J, Schappe T, Hsiao K, Leclerc GM, You L, Echeverri C, Spanoudis C, Carvalho A, Kanakaraj L, Gilkes C, Encalada N, Kong L, Wang M, Fang B, Wang Z, Jiao JA, Muniz GJ, Jeng EK, Valdivieso N, Li L, Deth R, Berrien-Elliott MM, Fehniger TA, Rhode PR, Wong HC. Immunotherapeutic approach to reduce senescent cells and alleviate senescence-associated secretory phenotype in mice. Aging Cell. 2023 May;22(5):e13806. doi: 10.1111/acel.13806. Epub 2023 Mar 26. PMID: 36967480; PMCID: PMC10186597.

18. Wong P, **Foltz JA**, Chang L, Neal CC, Yao T, Cubitt CC, Tran J, Kersting-Schadek S, Palakurty S, Jaeger N, Russler-Germain DA, Marin ND, Gang M, Wagner JA, Zhou AY, Jacobs MT, Foster M, Schappe T, Marsala L, McClain E, Pence P, Becker-Hapak M, Fisk B, Petti AA, Griffith OL, Griffith M, Berrien-Elliott MM, Fehniger TA. T-BET and EOMES sustain mature human NK cell identity and antitumor function. J Clin Invest. 2023 Jul 3;133(13):e162530. doi: 10.1172/JCI162530. PMID: 37279078; PMCID: PMC10313375.

19. Jacobs MT, Wong P, Zhou AY, Becker-Hapak M, Marin ND, Marsala L, Foster M, **Foltz JA**, Cubitt CC, Tran J, Russler-Germain DA, Neal C, Kersting-Schadek S, Chang L, Schappe T, Pence P, McClain E, Zevallos JP, Rich JT, Paniello RC, Jackson RS, Pipkorn P, Adkins DR, DeSelm CJ, Berrien-Elliott MM, Puram SV, Fehniger TA. Memory-like Differentiation, Tumor-Targeting mAbs, and Chimeric Antigen Receptors Enhance Natural Killer Cell Responses to Head and Neck Cancer. Clin Cancer Res. 2023 Oct 13;29(20):4196-4208. doi: 10.1158/1078-0432.CCR-23-0156. PMID: 37556118.

20. Gomez F, Fisk B, McMichael JF, Mosior M, **Foltz JA**, Skidmore ZL, Duncavage EJ, Miller CA, Abel H, Li YS, Russler-Germain DA, Krysiak K, Watkins MP, Ramirez CA, Schmidt A, Martins Rodrigues F, Trani L, Khanna A, Wagner JA, Fulton RS, Fronick CC, O'Laughlin MD, Schappe T, Cashen AF, Mehta-Shah N, Kahl BS, Walker J, Bartlett NL, Griffith M, Fehniger TA, Griffith OL. Ultra-Deep Sequencing Reveals the Mutational Landscape of Classical Hodgkin Lymphoma. Cancer Res Commun. 2023 Nov 15;3(11):2312-2330. doi: 10.1158/2767-9764.CRC-23-0140. PMID: 37910143; PMCID: PMC10648575.

21. Hoang MH, Skidmore ZL, Rindt H, Chu S, Fisk B, **Foltz JA**, Fronick C, Fulton R, Zhou M, Bivens NJ, Reinero CN, Fehniger TA, Griffith M, Bryan JN, Griffith OL. Single-cell T-cell receptor repertoire profiling in dogs. Commun Biol. 2024 Apr 22;7(1):484. doi: 10.1038/s42003-024-06174-w. PMID: 38649520; PMCID: PMC11035579.

22. Marin ND, Becker-Hapak M, Song WM, Alayo QA, Marsala L, Sonnek N, Berrien-Elliott MM, Foster M, **Foltz JA**, Tran J, Wong P, Cubitt CC, Pence P, Hwang K, Zhou AY, Jacobs MT, Schappe T, Russler-Germain DA, Fields RC, Ciorba MA, Fehniger TA. Memory-like differentiation enhances NK cell responses against colorectal cancer. Oncoimmunology. 2024 May 7;13(1):2348254. doi: 10.1080/2162402X.2024.2348254. PMID: 38737793; PMCID: PMC11086027.

23. Cubitt CC, Wong P, Dorando HK, **Foltz JA**, Tran J, Marsala L, Marin ND, Foster M, Schappe T, Fatima H, Becker-Hapak M, Zhou AY, Hwang K, Jacobs MT, Russler-Germain DA, Mace EM, Berrien-Elliott MM, Payton JE, Fehniger TA. Induced CD8α identifies human NK cells with enhanced proliferative fitness and modulates NK cell activation. J Clin Invest. 2024 May 28:e173602. doi: 10.1172/JCI173602. Epub ahead of print. PMID: 38805302.

24. **Foltz JA**[†*], Tran J[†], Wong P, Fan C, Schmidt E, Fisk B, Becker-Hapak M, Russler-Germain DA, Johnson J, Marin ND, Cubitt CC, Pence P, Rueve J, Pureti S, Hwang K, Gao F, Zhou AY, Foster M, Schappe T, Marsala L, Berrien-Elliott MM, Cashen AF, Bednarski JJ, Fertig E, Griffith OL, Griffith M, Wang T, Petti AA, Fehniger TA*. Cytokines drive the formation of memory-like NK cell subsets via epigenetic rewiring and transcriptional regulation. Sci Immunol. 2024 Jun 28;9(96):eadk4893. doi: 10.1126/sciimmunol.adk4893. Epub 2024 Jun 28. PMID: 38941480.
[†]co-first authors, *co-corresponding authors

Invited Publications

1. **Foltz JA**, Miller J, Lee D. Natural Killer Cell-Based Immunotherapy. In: Immunotherapy in Translational Cancer Research. Cooper L, Mittendorf E, Moyes J, Prabhakaran S, editors. Hoboken, NJ, USA: John Wiley & Sons, Inc.; 2018-04. 215-227p.