

Inna Smalley, PhD

Associate Member, Metabolism and Physiology
Moffitt Cancer Center
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PERSONAL STATEMENT

I am dedicated to making transformative contributions to understanding leptomeningeal metastases and how the tumor microenvironment contributes to tumor growth and drug resistance. I have leveraged the use of single-cell and spatial transcriptomic technologies to reveal novel metabolic vulnerabilities and immune-suppressive mechanisms in melanoma CNS metastases. Establishing the first rapid autopsy program for CNS metastatic disease and developing of preclinical models for leptomeningeal disease enabled me to create critical research tools for the wider research community. My recent discovery that branched-chain keto acids drive immune suppression and neurodegeneration in leptomeningeal metastases represents a paradigm shift that has opened new therapeutic possibilities for the deadliest complication of late-stage cancers. I am deeply committed to mentoring early career scientists. This commitment extends through my role as the Associate Director of Moffitt's Cancer PhD Program and through service in local, national, and international projects aimed at promoting the career development of undergraduate, graduate, and postdoctoral trainees. I hope to shape the future of cancer research while continuing to drive innovative discoveries that ultimately improve outcomes for patients with devastating central nervous system metastases. I have previously published under my maiden name: Inna V. Fedorenko.

POSITIONS AND AFFILIATIONS

Associate Member, January 2026- present

Metabolism and Physiology (primary appointment)
H. Lee Moffitt Cancer Center and Research Institute
12902 Magnolia Drive, Tampa FL 33612

Associate Member, January 2026- present

Cutaneous Oncology (secondary appointment)
H. Lee Moffitt Cancer Center and Research Institute
12902 Magnolia Drive, Tampa FL 33612

Associate Director, Recruitment and Engagement, June 2025-current

Cancer PhD Program
H. Lee Moffitt Cancer Center and Research Institute and University of South Florida
12902 Magnolia Drive, Tampa FL 33612

Assistant Member, July 2020- December 2025

Metabolism and Physiology (primary appointment)
H. Lee Moffitt Cancer Center and Research Institute
12902 Magnolia Drive, Tampa FL 33612

Assistant Member, July 2020- December 2025

Cutaneous Oncology (secondary appointment)
H. Lee Moffitt Cancer Center and Research Institute
12902 Magnolia Drive, Tampa FL 33612

Assistant Professor, July 2020- current

Department of Oncologic Sciences, MDC44
Morsani College of Medicine
University of South Florida
12901 Bruce B. Downs Blvd, Tampa FL 33612

Cancer Biology Major Director, September 2024-May 2024

Cancer PhD Program
 H. Lee Moffitt Cancer Center and Research Institute and University of South Florida
 12902 Magnolia Drive, Tampa FL 33612

ACADEMIC RESEARCH EXPERIENCE

Faculty, July 2020- current

Metabolism and Physiology
 H. Lee Moffitt Cancer Center and Research Institute

Postdoctoral Fellow, July 2014- July 2020

Tumor Biology
 H. Lee Moffitt Cancer Center and Research Institute

Cancer Biology Ph.D. Program, Aug 2009- July 2014

Molecular Oncology
 H. Lee Moffitt Cancer Center and Research Institute

Research Assistant II, Jan 2009- July 2009

Risk Assessment, Detection and Intervention Program
 H. Lee Moffitt Cancer Center and Research Institute

Research Assistant I, Feb 2008- Jan 2009

Risk Assessment, Detection and Intervention Program
 H. Lee Moffitt Cancer Center and Research Institute

Research Assistant (Volunteer), 2005-2008

Risk Assessment, Detection and Intervention Program
 H. Lee Moffitt Cancer Center and Research Institute

SPARK Intern, Summer 2007

Risk Assessment, Detection and Intervention Program
 H. Lee Moffitt Cancer Center and Research Institute

EDUCATION

- 2009-2014 Cancer Biology Ph.D. Program at H. Lee Moffitt Cancer Center, through the University of South Florida.
- 2005-2008 University of South Florida Honors College B.S. in Biology. Graduated Cum Laude from USF Honor's College.
- 2001-2005 International Baccalaureate Program Honor Graduate from Hillsborough High School, Tampa, Florida.

PUBLICATIONS

1. Vallebuna EJ, **Smalley I.** Spatially Resolved Opto-Omics Uncovers Functional Microglial Subtypes in Brain Metastasis. Cancer Res. 2026 Mar 16;86(6):1345-1346.
2. Lazure, F., Drapela, S., Liu, X., Lockhart, J. H., Kashfi, H., Sarigul, N., Ilter, D., Flores, E. R., Wang, X., **Smalley, I.**, Jaeger, A., Yu, X., & Gomes, A. P. (2025, January 24). Aging directs the differential evolution of KRAS-driven lung adenocarcinoma [Preprint]. bioRxiv.
3. Piña Y, Law V, Sahebjam S, Tran N, Siddarajappa N, Li J, Mo Q, Phadke MS, Arrington J, Macaulay R, Mokhtari S, Evernden B, Ahmed KA, **Smalley I.** Yu M, Smalley KSM, Forsyth PA. Phase IB Study of Avelumab and Whole

Brain Radiotherapy (WBRT) in Patients with Leptomeningeal Disease (LMD) from Solid Tumors: Results and Molecular Analyses. *Neuro Oncol.* 2025 Dec 1;27(12):3237-3249

4. Ospina OE, Manjarres-Betancur R, Gonzalez-Calderon G, Soupier AC, **Smalley I**, Tsai KY, Markowitz J, Khaled ML, Vallebuona E, Berglund AE, Eschrich SA, Yu X, Fridley BL. spatialGE Is a User-Friendly Web Application That Facilitates Spatial Transcriptomics Data Analysis. *Cancer Res.* 2025 Mar 3;85(5):848-858.
5. Alhaddad H, Ospina OE, Khaled ML, Ren Y, Vallebuona E, Booze MB, Forsyth P, Pina Y, Macaulay R, Law V, Tsai KY, Cress WD, Fridley B, & **Smalley I**. (2023). Spatial transcriptomics analysis identifies a unique tumor-promoting function of the meningeal stroma in melanoma leptomeningeal disease. *Cell Rep Med.* 2024 Jun 18;5(6):101606.
6. Wilcox JA, Chukwueke U, Ahn M, Aizer A, Bale TA, Brandma D, Brastianos PK, Chang S, Daras M, Forsyth P, Garzia L, Glantz M, Glitza IS, Kumthekar P, Le Rhun EL, Nagpal S, O'Brien B, Pentsova E, Lee EQ, Remsik J, Ruda R, **Smalley I**, Taylor MD, Weller M, Wefel J, Yang JT, Wen PY, Boire AA. Leptomeningeal metastases from solid tumors: A SNO and ASCO consensus review on clinical management and future directions. *Neuro Oncol.* 2024 Oct 3;26(10):1781-1804.
7. Law V, **Smalley I**, Evernden BR, Baldwin M, Smalley KSM, Forsyth, PA. Ex Vivo Culture of Circulating Tumor Cells in the Cerebral Spinal Fluid from Melanoma Patients to Study Melanoma-Associated Leptomeningeal Disease. *J Vis Exp.* 2024 Mar 29;(205). doi: 10.3791/66071.
8. Khaled ML, Ren Y, Kundalia R, Alhaddad H, Chen Z, Wallace GC, Evernden B, Ospina OE, Hall M, Liu M, Darville LNF, Izumi V, Chen YA, Pilon-Thomas S, Stewart PA, Koomen JM, Corallo SA, Jain MD, Robinson TJ, Locke FL, Forsyth PA, **Smalley, I**. (2023). Branched-chain keto acids promote an immune-suppressive and neurodegenerative microenvironment in leptomeningeal disease. *bioRxiv*, 2023.2012.2018.572239. Preprint.
9. Wallace G, Kundalia R, Cao B, Kim Y, Forsyth P, Soyano A, **Smalley I***, Yolanda P*. Factors improving overall survival in breast cancer patients with leptomeningeal disease (LMD): A single institutional retrospective review. March 2023. *Breast Cancer Res.* 2024 Mar 29;26(1):55. * **co-corresponding, co-senior authors.**
10. Eroglu, Z., Chen, Y., **Smalley, I.**, Li, J., Markowitz, J., Brohl, A., Tetteh, L., Taylor, H., Sondak, V., Khushalani, N., Smalley, KSM. Combined BRAF, MEK and heat shock protein 90 (HSP90) inhibition in advanced BRAFV600 mutant melanoma. *Cancer.* 2023 Sep 30. doi: 10.1002/cncr.35029. Online ahead of print.
11. **Smalley I**, Boire A, Brastianos P, Kluger HM, Hernando-Monge E, Forsyth PA, Ahmed KA, Smalley KSM, Ferguson S, Davies, MA, Glitza Olivia IC. Leptomeningeal disease in melanoma: an update on the developments in pathophysiology and clinical care. *Pigment Cell Melanoma Res.* 2023 Aug 25. doi: 10.1111/pcmr.13116.
12. Khaled ML, Tarhini AA, Forsyth PA, **Smalley I** and Piña Y. Leptomeningeal Disease (LMD) in Patients with Melanoma Metastases. *Cancers* 2023 March 21; 15(6), 1884
13. **Smalley I**, Smalley KSM. Space Is the Place: Mapping the Cell–Cell Interactions That Predict Immunotherapy Responses in Melanoma. *Cancer Research.* 2022 Sep 16;82(18):3198-3200.
14. Ospina OE, Wilson CM, Soupier AC, Berglund A, **Smalley I**, Tsai K, and Fridley BL. spacialGE: Quantification and visualization of the tumor microenvironment heterogeneity using spatial transcriptomics. *Bioinformatics.* 2022 Apr 28;38(9):2645-2647.
15. Law V, Chen Z, Vena F, **Smalley I**, Macaulay R, Evernden BR, Tran N, Pina Y, Puskas J, Caceres G, Bayle S, Johnson J, Liu JKC, Etame A, Vogelbaum M, Rodriguez P, Duckett D, Czerniecki B, Chen A, Smalley KSM, and Forsyth PA. A preclinical model of patient-derived cerebrospinal fluid circulating tumor cells for experimental therapeutics in leptomeningeal disease from melanoma. *Neuro-Oncology.* 2022 Oct 3;24(10):1673-1686.

16. Sriramareddy SN, Faião-Flores F, Emmons MF, Saha B, Chellappan S, Wyatt C, **Smalley I**, Licht JD, Durante MA, Harbour JW, and Smalley KSM. HDAC11 activity contributes to MEK inhibitor escape in uveal melanoma. *Cancer Gene Therapy*. 2022 Dec;29(12):1840-1846. doi: 10.1038/s41417-022-00452-7.
17. Li J[#], **Smalley I**[#], Chen Z, Wu J, Phadke M, Teer J, Nguyen T, Karreth F, Koomen J, Sarnaik A, Zager J, Khushalani N, Tarhini A, Sondak V, Rodriguez P, Messina J, Chen YA, and Smalley KSM. Single cell characterization of the cellular landscape of acral melanoma identifies novel targets for immunotherapy. *Clinical Cancer Research*. March 04, 2022. **# Contributed equally.**
18. **Smalley I**^{**}, Chen Z[#], Phadke M, Wyatt C, Law W, Eroglu Z, Tran N, Forsyth P, Chen YA^{*}, Smalley KSM^{*}. Single-Cell Characterization of the Immune Microenvironment of Melanoma Brain and Leptomeningeal Metastases. *Clinical Cancer Research*. 25 May 2021, 27(14):4109-4125. **# Contributed equally. *Corresponding author.**
19. Phadke, M.S., Chen, Z., Li, J., Mohamed, E., Davies, M.A., **Smalley, I.**, Duckett, D., Palve, V., Czerniecki, B.J., Forsyth, P.A., Noyes, D., Adeegbe, D.O., Eroglu, Z., Nguyen, K.T., Tsai, K.Y., Rix, U., Burd, C.E., Chen, Y.A., Rodriguez, P.C., Smalley, K.S.M.: Targeted therapy given after anti-PD-1 leads to prolonged responses in mouse melanoma models through sustained antitumor immunity. *Cancer Immunol Res*. 2021. 2021 May;9(5):554-567.
20. Law, V., Baldwin, M., Ramamoorthi, G., Kodumudi, K., Tran, N., **Smalley, I.**, Duckett, D., Kalinski, P., Czerniecki, B., Smalley, K. S. M., Forsyth, P. A. A Murine Ommaya Xenograft Model to Study Direct-Targeted Therapy of Leptomeningeal Disease. *J. Vis. Exp.* (167), e62033. Jan 29, 2021.
21. Zhang C, **Smalley I**^{*}, Emmons MF, Sharma R, Izumi V, Messina J, Koomen JM, Pasquale EB, Forsyth PA, Smalley KSM^{*} Non-canonical EphA2 signaling is a driver of tumor-endothelial cell interactions and metastatic dissemination in BRAF inhibitor resistant melanoma. *Journal for Investigative Dermatology*. 2020 Sep 2;S0022-202X(20)32047-9 ***Corresponding author.**
22. **Smalley I**, Law V, Wyatt C, Fang B, Koomen, JM, Welsh E, Macaulay R, Forsyth PA, Smalley KSM. Proteomic analysis of CSF from patients with leptomeningeal melanoma metastases identifies signatures associated with disease progression and mediators of therapy resistance. *Clin Cancer Res*. 2020 May 1;26(9):2163-2175.
23. Glitza I, Smalley K, Brastianos P, Davies M, McCutcheon I, Liu J, Ahmed K, Arrington J, Evernden B, **Smalley I**, Eroglu Z, Khushalani N, Margolin K, Kluger H, Atkins M, Tawbi H, Boire A, Forsyth P. Leptomeningeal Disease in Melanoma Patients: An update to treatment, challenges, and future directions. *Pigment Cell Melanoma Research* 2020 Jul;33(4):527-541.
24. **Smalley I**, Kim E, Li J, Spence P, Wyatt CJ, Eroglu Z, Sondak VK, Messina JL, Babacan NA, Maria-Engler SS, De Armas L, Williams SL, Gatenby RA, Chen YA, Anderson ARA, Smalley KSM. Leveraging transcriptional dynamics to improve BRAF inhibitor responses in melanoma. *eBioMedicine*. 2019 Oct;48:178-190.
25. Eroglu Z, Holmen SL, Chen Q, Khushalani NI, Amaravadi R, Thomas R, Ahmed KA, Tawbi H, Chandra S, Markowitz J, **Smalley I**, Liu JKC, Chen YA, Najjar YG, Karreth FA, Abate-Daga D, Glitza IC, Sosman JA, Sondak VK, Bosenberg M, Herlyn M, Atkins MB, Kluger H, Margolin K, Forsyth PA, Davies MA, Smalley KSM. Melanoma central nervous system metastases: An update to approaches, challenges, and opportunities. *Pigment Cell Melanoma Res*. 2019 May;32(3):458-469.
26. Eroglu Z, Chen YA, Gibney GT, Weber JS, Kudchadkar RR, Khushalani NI, Markowitz J, Brohl AS, Tetteh LF, Ramadan H, Arnone G, Li J, Zhao X, Sharma R, Darville LNF, Fang B, **Smalley I**, Messina JL, Koomen JM, Sondak VK, Smalley KSM. Combined BRAF and HSP90 inhibition in patients with unresectable BRAF V600E mutant melanoma. *Clin Cancer Res*. 2018 Nov 15;24(22):5516-5524.
27. **Smalley I**, Smalley KSM. ERK Inhibition: A New Front in the War against MAPK Pathway-Driven Cancers? *Cancer Discov*. 2018 Feb;8(2):140-142.

28. Abate-Daga D, Ramello MC, **Smalley I**, Forsyth PA, Smalley KSM. The biology and therapeutic management of melanoma brain metastases. *Biochem Pharmacol*. 2018 Jul;153:35-45.
29. Phadke M, Remsing Rix LL, **Smalley I**, Bryant AT, Luo Y, Lawrence HR, Schaible BJ, Chen YA, Rix U, and Smalley KSM. Dabrafenib inhibits the growth of BRAF-WT cancers through CDK16 and NEK9 inhibition. *Molecular Oncology*. *Mol Oncol*. 2018 Jan;12(1):74-88.
30. Robinson JP, Rebecca VW, Kircher DA, Silvis MR, **Smalley I**, Gibney GT, Lastwika KJ, Chen G, Davies MA, Grossman D, Smalley KSM, Holmen SL, VanBrocklin MW. Resistance mechanisms to genetic suppression of mutant NRAS in melanoma. *Melanoma Res*. 2017 Dec;27(6):545-557
31. Li J, **Smalley I**, Schell MJ, Smalley KSM, Chen YA. SinCHet: a MATLAB toolbox for single cell heterogeneity analysis in cancer. *Bioinformatics*. 017 Sep 15;33(18):2951-2953
32. Sharma R*, **Fedorenko I***, Spence PT, Sondak VK, Smalley KS, Koomen JM. Activity-Based Protein Profiling Shows Heterogeneous Signaling Adaptations to BRAF Inhibition. *J Proteome Res*. 2016 Dec 2;15(12):4476-4489.
*Co-first authors
33. **Fedorenko IV**, Evernden B, Kenchappa RS, Sahebjam S, Ryzhova E, Puskas J, McIntosh L, Caceres G, Magliocco A, Etame A, Harbour JW, Smalley KSM, Forsyth PA. A rare case of leptomeningeal carcinomatosis in a patient with uveal melanoma: case report and review of literature. *Melanoma Research*. 2016 Oct;26(5):481-6.
34. Smalley KSM, **Fedorenko IV**, Kenchappa R, Sahebjam S, Forsyth P. Managing leptomeningeal melanoma metastases in the era of immune and targeted therapy. *International Journal of Cancer*. February 2016. 2016 Sep 15;139(6):1195-201
35. **Fedorenko IV***, Smalley KSM. The complexity of microenvironment-mediated drug resistance. *Genes Cancer*. 2015 Sep;6(9-10):367-368. *Corresponding author.
36. **Fedorenko IV**, Wargo JA, Flaherty KT, Smalley KSM. BRAF inhibition generates a host/tumor niche that mediates therapeutic escape. *J Invest Derm*. 2015 Aug 24. 2015 Dec;135(12):3115-24.
37. Phadke, M., Gibney, G., Rich, C., **Fedorenko, I.V.**, Chen A., Kudchadkar, R., Sondak, V.K., Weber, J., Messina, J., Smalley, K.S.M.: XL888 limits vemurafenib-induced proliferative skin events by suppressing paradoxical MAPK activation. *J Invest Derm*. 2015 Oct;135(10):2542-4.
38. **Fedorenko IV**, Abel EV, Koomen JM, Fang B, Wood ER, Chen A, Fisher KJ, Iyengar S, Dahlman KB, Wargo JA, Flaherty KT, Sosman JA, Sondak VK, Messina JL, Gibney GT, Smalley KSM. Fibronectin induction abrogates the BRAF inhibitor response of BRAF V600E/PTEN-null melanoma cells. *Oncogene*. 2016 Mar 10;35(10):1225-35.
39. Smalley KSM and **Fedorenko IV**. Inhibition of BRAF and BRAF+MEK drives a metastatic switch in melanoma. *Molecular & Cellular Oncology*, 2015 Mar 19;2(4)
40. Paraiso KH, Das Thakur M, Fang B, Koomen JM, **Fedorenko IV**, John JK, Tsao H, Flaherty KT, Sondak VK, Messina JL, Pasquale EB, Villagra A, Rao UN, Kirkwood JM, Meier F, Sloat S, Gibney GT, Stuart D, Tawbi H, Smalley KS. Ligand independent EphA2 signaling drives the adoption of a targeted therapy-mediated metastatic melanoma phenotype. *Cancer Discov*. 2015 Mar;5(3):264-73.
41. **Fedorenko IV**, Gibney GT, Sondak VK, Smalley KS. Beyond BRAF: where to next for melanoma targeted therapy? *Br J Cancer*. 2015 Jan 20;112(2):217-26.

42. **Fedorenko IV**, Fang B, Munko AC, Paraiso KHT, Gibney GT, Koomen JM, Smalley KS. Phosphoproteomic analysis of basal and therapy-induced adaptive signaling networks in BRAF and NRAS mutant melanoma. *Proteomics*. 2015 Jan;15(2-3):327-39.
43. **Fedorenko IV**, Fang, B, Koomen, JM, Gibney, GT, Smalley, KS. Amuvatinib has cytotoxic effects against NRAS but not BRAF mutant melanoma. *Melanoma Research*. 2014 Oct;24(5):448-53.
44. Rebecca VW, Wood ER, **Fedorenko IV**, Paraiso KH, Haarberg HE, Chen Y, Xiang Y, Sarnaik A, Gibney GT, Sondak VK, Koomen JM, Smalley KS. Evaluating Melanoma Drug Response and Therapeutic Escape with Quantitative Proteomics. *Mol Cell Proteomics*. 2014 Jul;13(7):1844-54
45. Rebecca VW, Massaro R, **Fedorenko IV**, Gibney GT, Sondak VK, Amavaradi RK, Jin S, Maria-Engler SS, Kudchadkar RR, Smalley KSM: Inhibition of autophagy enhances the effects of the AKT inhibitor MK-2206 when combined with paclitaxel and carboplatin in BRAF wild-type melanoma. *Pigment Cell and Melanoma Research* 2014 May;27(3):465-78.
46. Sloat S, **Fedorenko IV**, Smalley KS, Gibney GT. Long-term effects of BRAF inhibitors in melanoma treatment: friend or foe? *Expert Opin Pharmacother*. 2014 Apr;15(5):589-92
47. Kim E, Rebecca V, **Fedorenko IV**, Messina JL, Mathew R, Maria-Engler SS, Basanta D, Smalley KS, Anderson AR. Senescent Fibroblasts in Melanoma Initiation and Progression: An Integrated Theoretical, Experimental, and Clinical Approach. *Cancer Res*. 2013 Dec 1;73(23):6874-85.
48. Pimiento JM, Larkin EM, Smalley KS, Wiersma GL, Monks NR, **Fedorenko IV**, Peterson CA, Nickoloff BJ. Melanoma genotypes and phenotypes get personal. *Lab Invest*. 2013 Aug;93(8):858-67. Featured on cover.
49. Gibney GT, Messina JL, **Fedorenko IV**, Sondak VK, Smalley KS. Paradoxical oncogenesis--the long-term effects of BRAF inhibition in melanoma. *Nat Rev Clin Oncol*. 2013 Jul;10(7):390-9.
50. **Fedorenko IV**, Gibney GT, Smalley KSM. NRAS mutant melanoma: biological behavior and future strategies for therapeutic management. *Oncogene*. 2013 Jun 20;32(25):3009-18
51. **Fedorenko IV**, Paraiso KH, Smalley KS. Acquired and intrinsic BRAF inhibitor resistance in BRAF V600E mutant melanoma. *Biochem Pharmacol*. 2011 Aug 1;82(3):201-9.
52. Paraiso K.H.T., Xiang Y., Rebecca V., Abel E.V., Chen Y.A., Munko A.C., Wood E., **Fedorenko IV**., Sondak V.K., Anderson A.R.A, Ribas A., Palma M.D., Nathanson K.L, Koomen J.M., Messina J.L., Smalley K.S.M. PTEN loss confers BRAF inhibitor resistance to melanoma cells through the suppression of BIM expression. *Can Res*. 2011 Apr 1;71(7):2750-60. Epub 2011 Feb 11. As highlighted in *Nature Rev Clin Oncol*. 2011 May;8(5):253.
53. Paraiso K.H.T., **Fedorenko, I.V.**, Cantini, L.P., Munko, A. C., Hall, M. S., Sondak, V. K., Messina, J. L., Flaherty, K.T., Smalley, K. S. Recovery of phospho-ERK activity allows melanoma cells to escape from BRAF inhibitor therapy. *Br J Cancer* 2010 Jun 8;102(12):1724-30.
54. Song D., **Fedorenko I.**, Pensky M., Qian W., Tockman M., Zhukov T. Quantificational and Statistical Analysis of the Differences in Centrosomal Features of Untreated Lung Cancer Cells and Normal Cells. *Analytical and Quantitative Cytology and Histology* 2009 Oct 32 (5) 280-290.
55. Liu X., Lloyd M. C., **Fedorenko I. V.**, Bapat P., Zhukov T., Huo Q. Enhanced imaging and accelerated photothermolysis of A549 human lung cancer cells by gold nanospheres. *Nanomedicine* 2008 Oct: 3(5): 617-26

Khaled ML, Vallebuona EJ, Ren Y, Booze MB, Kundalia R, Alhaddad H, Chen Z, Wallace GC, Evernden BR, Ospina OE, Hall MS, Liu M, Darville LNF, Izumi V, Chen YA, Pilon-Thomas S, Stewart PA, Koomen JM, Corallo SA, Jain MD, Holmen S, Gomes AP, Robinson TJ, Locke FL, Forsyth PA, **Smalley I**. A pan-cancer atlas of leptomeningeal disease reveals branched chain keto acids drive immunosuppression and neurodegeneration. Under consideration at *Nature*.

CURRENT RESEARCH SUPPORT

William G. "Bill" Bankhead, Jr., and David Coley Cancer Research Program Grant (PI: Inna Smalley)

Grant #: 25B02

Name of PI: Inna Smalley

Dates: 01/01/2026 - 12/31/2028

Funding Source: Florida Department of Health

Title: "Understanding how tumor cells co-opt meningeal stroma in melanoma leptomeningeal disease."

Role in the Study: PI

Research Scholar Grant American Cancer Society (PI: Inna Smalley)

Project #: RSG-23-1040487-01-MM

Name of PI: Inna Smalley

Dates: 06/30/2023-06/30/2027

Funding Source: American Cancer Society

Title: "Improving therapy for leptomeningeal Non-Hodgkin B cell lymphoma by targeting the metabolic tumor microenvironment"

Role in the Study: PI

Using Combinatorial Therapies with Dendritic Cell Therapies to Improve Survival and Prevent Recurrence of Breast Cancer Leptomeningeal Disease (LMD)

Name of PD/PI: Forsyth, P.

Source of Support: US Army/CDMRP Breast Cancer Research Program (BCRP) Level 4

Project/Proposal Start and End Date: 09/01/2025 – 08/31/2029

Role in the Study: Collaborator

Young Investigator Award from Melanoma Research Alliance (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 06/01/2022-05/31/2025, in NCE period.

Funding Source: Melanoma Research Alliance

Title: "Tumor-stroma metabolic crosstalk in melanoma brain metastases"

Role in the Study: PI

Miles for Moffitt Team Science Award

Project #: N/A

Name of PI: Inna Smalley

Dates: 11/01/2025-10/31/2026

Funding Source: Moffitt Cancer Center

Title: "The role of branched-chain keto acids in tumor-promoting meningeal stroma cell activation"

Role in the Study: PI

Donald A. Adam Melanoma and Skin Cancer Center of Excellence (MSCCoE) and Cutaneous Oncology Award (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 05/01/2026-04/30/2027

Funding Source: Moffitt Cancer Center

Title: "Elucidating the metabolic mechanism of sodium phenylbutyrate in melanoma leptomeningeal disease"

Role in the Study: PI

Metabolism Program Collaborative Award

Project #: N/A

Name of PI: Inna Smalley

Dates: 07/01/2024-06/30/2025

Funding Source: Moffitt Cancer Center

Title: "Preclinical optimization of safety and efficacy of phenylbutyrate therapies for leptomeningeal disease"

Role in the Study: PI

PAST RESEARCH SUPPORT

U01 (PI: Brooke Fridley, Co-Investigator Inna Smalley)

Project #: 1U01 CA274489-01

Name of PI: Brooke Fridley

Dates: 09/01/2022-08/31/2025

Funding Source: National Institutes of Health

Title: "Analytical tools for studying the tumor microenvironment leveraging spatial transcriptomics"

Role in the Study: Co-Investigator

Donald A. Adam Melanoma and Skin Cancer Center of Excellence (MSCCoE) and Cutaneous Oncology Award (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 09/01/2024-06/30/2025

Funding Source: Moffitt Cancer Center

Title: "Preclinical study of phenylbutyrate for the treatment of melanoma leptomeningeal disease "

Role in the Study: PI

ACS TheoryLab Collaborative Pilot Grant

Project #: TLC-23-1180750-01-TLC

Name of PI: Inna Smalley and Ana Gomes

Dates: 01/01/2024 - 12/31/2024

Funding Source: American Cancer Society

Title: "How the aging tumor microenvironment affects development of leptomeningeal metastases"

Role in the Study: PI

R21 (PI: Inna Smalley)

Project #: R21 CA274060

Name of PI: Inna Smalley

Dates: 09/01/2022-02/28/2025

Funding Source: National Institutes of Health

Title: "Defining and targeting the immune-suppressive metabolic microenvironment of leptomeningeal melanoma metastases"

Role in the Study: PI

R00 Pathway to Independence Award (PI: Inna Smalley)

Project #: R00CA226679

Name of PI: Inna Smalley

Dates: 08/01/2020 - 08/31/2024

Funding Source: National Institutes of Health

Title: "Defining the role of metabolic heterogeneity in melanoma dissemination and therapy escape."

Role in the Study: PI

Donald A. Adam Melanoma and Skin Cancer Center of Excellence (MSCCoE) and Cutaneous Oncology Award (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley and Ana Gomes

Dates: 12/01/2023 - 05/31/2024

Funding Source: Moffitt Cancer Center

Title: "Mapping the age-related changes in cerebrospinal fluid of melanoma LMD "

Role in the Study: PI

Center of Excellence in Evolutionary Therapy Award (PI: Noemi Andor and Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley and Noemi Andor

Dates: 01/01/2024 - 06/30/2024

Funding Source: Moffitt Cancer Center

Title: "Testing Karyotype Evolution as a Biomarker of Immune Fitness and ICI Therapy Response in the Brain Tumor Microenvironment"

Role in the Study: PI

Donald A. Adam Melanoma and Skin Cancer Center of Excellence (MSCCoE) and Cutaneous Oncology Award (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 09/2022-05/2023

Funding Source: Moffitt Cancer Center

Title: "Sensitizing leptomeningeal melanoma to checkpoint inhibitor therapy"

Role in the Study: PI

Innovative Core Grant (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 01/17/2022-05/17/2023

Funding Source: Moffitt Cancer Center

Title: "Developing spatial multi-omics approaches for the study of the tumor microenvironment."

Role in the Study: PI

Team Science Award (PI: Inna Smalley, co-PI Ann Chen)

Project #: N/A

Name of PI: Inna Smalley

Dates: 02/01/2022 - 03/31/2023

Funding Source: Moffitt Cancer Center

Title: "Tumor-stroma metabolic crosstalk in melanoma brain metastases."

Role in the Study: PI

Bankhead-Coley Discovery Science Award (PI: Inna Smalley) (Relinquished early due to overlap with another award)

Project #: 22B04

Name of PI: Inna Smalley

Dates: 02/01/2022 - 08/31/2022

Funding Source: State of Florida

Title: “Defining and targeting the immune-suppressive metabolic microenvironment of leptomeningeal melanoma metastases.”

Role in the Study: PI

Scientific Grant from Florida Breast Cancer Foundation (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 07/01/2021 - 06/30/2022

Funding Source: Florida Breast Cancer Foundation

Title: “Defining and targeting the pro-tumorigenic metabolic microenvironment of leptomeningeal metastasis in triple-negative breast cancer.”

Role in the Study: PI

Malignant Hematology Grant Award (PI: I. Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 12/01/2019 - 07/31/2021

Funding Source: Moffitt Cancer Center

Title: “Improving the understanding and diagnosis of leptomeningeal lymphoma metastasis.”

Role in the Study: PI

K99 Pathway to Independence Award (PI: Inna Smalley)

Project #: K99 CA226679

Name of PI: Inna Smalley

Dates: 04/01/2018 - 07/31/2020

Funding Source: National Institutes of Health

Title: “Defining the role of metabolic heterogeneity in melanoma dissemination and therapy escape.”

Role in the Study: PI

Career Development Award from the Melanoma Research Foundation (PI: Inna Smalley)

Project #: 932727

Name of PI: Inna Smalley

Dates: 10/01/2016 - 09/30/2017

Funding Source: Melanoma Research Foundation

Title: Identifying and Targeting Melanoma Cells that Metastasize to the Brain

Role in the Study: PI

Research Scholar Award from the Joanna M. Nicolay Melanoma Foundation (PI: Inna Smalley)

Project #: N/A

Name of PI: Inna Smalley

Dates: 03/17/14- 03/16/15

Funding Source: Joanna M. Nicolay Melanoma Foundation

Title: Using quantitative proteomics to define therapy-induced signaling adaptation and clonal heterogeneity in vivo

Role in the Study: PI

INVITED ORAL PRESENTATIONS/SESSION CHAIR/THINK TANK PARTICIPANT:

1. Invited speaker at New York University, New York, April 23rd 2026. “When Location Is Destiny: The Leptomeningeal Microenvironment as a Driver of Cancer Aggression.”
2. Co-organizer and Chair of the Melanoma Metastasis & Therapy Session at the Pan-American Society for Pigment Cell Research Annual Meeting 2026. Tampa Florida March 5-6th 2026.

3. 20th Meeting of the European Association of Neuro-Oncology (EANO 2025). “A pan-cancer atlas of leptomeningeal disease reveals branched chain keto acids drive immunosuppression and neurodegeneration.” October 16-19, 2025 in Prague, Czech Republic.
4. Derm Scholars Lecture Series. “The Current State of Melanoma Research.” University of South Florida, April 7th 2025.
5. 11th World Congress of Melanoma in conjunction with the 21st EADO Congress. Athens, Greece April 3-5th 2025.
6. Melanoma Research Alliance Scientific Retreat. “The unique microenvironment of CNS melanomas promotes tumor growth, drug resistance, and immune suppression.” Washington DC February 26-28th 2025.
7. Molecular and Cellular Biology Seminar & Roswell Park’s Women in Science Speaker. “The unique metabolic and stromal microenvironment of leptomeningeal cancers promotes tumor growth, drug resistance, and immune suppression.” Roswell Park, Buffalo, NY. November 6th 2024.
8. Invited speaker for October 2024 session of the Empowering Single-cell Genomics in Latin America Course Hosted by Instituto Nacional de Câncer – INCA, Brazil and funded by the Chan Zuckerberg Initiative.
9. RANO-Leptomeningeal Metastasis Participant at the EANO. Glasgow October 19th, 2024.
10. Session Chair for the 21st Annual Meeting of the Society for Melanoma Research (SMR Congress). New Orleans, Louisiana, October 10-13th 2024.
11. Session Chair and invited speaker, Melanoma: From Prevention to Therapy. 2024 PanAmerican Society for Pigment Cell Research Meeting, New York City, NY, September 2024.
12. Leptomeningeal Metastasis Think Tank participant and invited speaker for the 2024 SNO/ASCO CNS Metastases Conference. “Branched-chain keto acids promote an immune-suppressive and neurodegenerative microenvironment in leptomeningeal disease.” Denver, Colorado, August 8-10th 2024.
13. Workshop on Melanoma Models and Translational Oncology. “Utilizing single-cell transcriptomics analysis to understand the biology of melanoma at different metastatic sites.” Sao Paulo, Brazil on July 10th, 2024
14. Keystone Symposia: Tumor Metabolism. “Branched-chain keto acids promote an immune-suppressive and neurodegenerative microenvironment in leptomeningeal disease.” Banff Springs, Canada, February 12-15th 2024.
15. “Spatial multi-omic analysis identifies a unique pro-tumorigenic function of the meningeal stroma in melanoma leptomeningeal disease.” Society for Melanoma Research 20th International Congress, Philadelphia, PA, November 2023.
16. Leptomeningeal Metastasis Think Tank and Session Moderator for Session 5: Basic Science of Leptomeningeal Metastasis, 2023 Society for Neuro Oncology/ASCO CNS Cancer Conference, San Francisco, CA, August 2023.
17. Central Florida Triangle Metabolism Meeting, Metabolism and Physiology, St. Petersburg, Florida, March 2023. “Metabolism of leptomeningeal disease.”
18. Society for Neuro-oncology Symposium on Therapeutic Development, Tampa, Florida, November 2023. “Understanding the cellular and metabolic landscape of lymphoma leptomeningeal disease.”
19. Single Cell Genomics Symposium. Tampa, FL, August 2022. “Utilizing single-cell transcriptomics analysis to understand the unique microenvironment of leptomeningeal metastasis.”

20. Cold Spring Harbor Laboratories Single Cell Analysis Course, New York, July 2022. "Utilizing single-cell transcriptomics analysis to understand the unique microenvironment of leptomeningeal metastasis."
21. Society for Melanoma Research Annual Congress, October 2021 "Single-cell analysis reveals how therapy remodels the tumor microenvironment in melanoma CNS metastases." Virtual international meeting..
22. Society for Neuro-Oncology Second Annual Conference on Brain Metastasis, August 2021. "Single cell analysis reveals how therapy remodels the tumor microenvironment in melanoma CNS metastases and uncovers a novel predictor of improved survival." Virtual international meeting.
23. Society for Neuro-Oncology Basic and Translational Science Conference, July 2021. "Single cell analysis reveals how therapy remodels the tumor microenvironment in melanoma CNS metastases and uncovers a novel predictor of improved survival." Virtual international meeting.
24. MRF Sponsored Second Summit on Melanoma Central Nervous System (CNS) Metastases. February 2018, Tampa, Florida. "The leptomeningeal microenvironment as protective sanctuary for melanoma cells."
25. AACR Immunobiology of Primary and Metastatic CNS Cancer: Multidisciplinary Science to Advance Cancer Immunotherapy. February 12-15th 2018, San Diego, CA. "Ligand-independent EphA2 signaling drives an amoeboid melanoma phenotype that metastasizes to the brain"
26. International Pigment Cell Conference: Breakthroughs in Pigment Cell and Melanoma Research, August 26th-30th 2017, Denver, CO. "S897E-EphA2 drives an amoeboid melanoma phenotype that metastasizes to the brain"
27. "The leptomeningeal microenvironment as protective sanctuary for melanoma cells." World Congress on Cancers of the Skin® and the Congress of the European Association of Dermato-Oncology (EADO) joint meeting. August 31 to September 3, 2016. Vienna, Austria.
28. "Aggressive melanomas establish a protective niche in response to drug therapies." St. Jude National Graduate Student Symposium (NGSS), 26-29 March 2013, Memphis, TN.
29. "Melanomas establish a protective niche in response to drug therapies." Society for Melanoma Research Congress November 8th 2012. Received Best Oral Presentation Award.
30. "Aggressive melanomas establish a protective niche in response to drug therapies." Wistar Institute, July 26th, 2012. Philadelphia, PA.

SPECIAL RECOGNITION & AWARDS:

- 2025 Moffitt Cancer Center Junior Faculty Researcher of the Year
- 2018 AACR Scholar-In-Training Award
- 2015 Career Development Award from Melanoma Research Foundation
- 2014 Joanna M Nicolay Melanoma Foundation Research Scholar Award
- 2013 Moffitt Scientific Symposium Oral Presentation Award
- 2012 Society for Melanoma Research Congress Best Oral Presentation Award
- 2012 Moffitt Scientific Symposium Oral Presentation Award
- 2012 Scholarship from CSHL for Single Cell Analysis Course
- 2011 Outstanding Research Accomplishment Award, Cancer Biology Ph.D. Program
- 2011 Advancing Science in America (ARCS) Scholar
- 2011 AACR Scholar-in-Training Award
- 2007 Gracie Allen Scholar for outstanding undergraduate thesis in cancer research
- 2005-2008 USF Honors College Research Scholar

LANGUAGES (Proficient in reading, writing, and speaking)

English, Ukrainian and Russian

MENTORSHIP AND TEACHING EXPERIENCE

UNIVERSITY COURSES:

Year	Course	Role	Topic
2023	Cancer Biology I	Lecturer	Signal Transduction, RAS and MAPK signaling
2023	Advances in Cancer Biology	Director	Entire Course (Fall)
2022	Cancer Biology I	Lecturer	Signal Transduction, RAS and MAPK signaling
2022	Advances in Cancer Biology	Director	Entire Course (Fall)
2021	Cancer Biology I	Lecturer	Signal Transduction, RAS and MAPK signaling
2020	Cancer Biology I	Lecturer	Signal Transduction, RAS and MAPK signaling
2019	Cancer Biology I	Lecturer	Signal Transduction, RAS and MAPK signaling

TRAINING AND CAREER DEVELOPMENT INITIATIVES FOR JUNIOR SCIENTISTS:

LOCAL:

2023-Present Co-chair of the Junior Scientist Research Partnership Award
 2024-Present Co-chair of the Moffitt Scientific Symposium

Mentoring USF undergraduate students: Mentoring (scientific and/or career guidance, based on need) University of South Florida undergraduate students both on an individual bases and through participation in invited seminars to share career development advice through the Derm Scholars student organization.

Grantsmanship Seminar (2020-2022): I have organized and taught a seminar for graduate students and postdocs aimed at acquiring NIH funding through the K mechanisms, with a special focus on assembling the application and writing strong career development and project narrative sections.

Grant Writing Academy (2020-Present): I mentored numerous postdocs through writing the Career Development section for the recurring Grant Writing Workshop (semi-annual). I have also mentored Wei Mu, Imene Hamaidi, Rebecca Hasterberg, Rachel Howard, Chang Jiang and others through individual K99/R00 application process.

NATIONAL:

Faculty Mentor for Footsteps to Funding Grant Writing Workshop: 2020-2022. The Geographic Management of Cancer Health Disparities Programs (GMaP) Region 2 (R2), 3P30CA076292-23S2. Footsteps to Funding is an interactive workshop open to doctoral students and Early Stage Investigators (ESIs) who reside in GMaP Region 2 (AL, AR, FL, GA, LA, MI, MS, PR). This workshop is intended to provide technical assistance related to writing federal grants (e.g., F31, F99/K00, K01, K08, K22, K99/R00, R03, R21) and knowledge about the essential components needed for a competitive grant application.

INTERNATONAL:

Single-cell analysis workshops/webinars series: promoting access to cutting edge technologies and large-scale omics data analysis for trainees in South America (collaboration with Drs Silvya Stuchi Maria Engler at University of Sao Paulo and Dr. Patricia Possik at the Brazilian National Cancer Institute). Invited instructor for the Cold Spring Harbor Single Cell Analysis Course 2022.

SERVICE

Active ad-hoc peer reviewer for journals: Nature Genetics, Nature Cancer, Science Advances, Science Translational Medicine, Science Signaling, Nature Communications, Cancer Research, npj Precision Oncology, Military Medical Research, Molecular Cancer Therapeutics, British Journal of Cancer, Pigment Cell & Melanoma Research, Pharmacological Research, Experimental and Molecular Pathology, Expert Review of Anticancer Therapy and PLoS ONE.

NON-PROFIT ORGANIZATIONS:

Year	Organization	Role
2024-Present	Leptomeningeal Cancer Foundation	Board of Directors Member

EDITORIAL BOARD:

Year	Journal	Role
2020-Present	Frontiers in Oncology	Review Editor for Skin Cancer
2020-Present	Frontiers in Cell and Developmental Biology	Review Editor for Molecular and Cellular Oncology

GRANT REVIEW:

Year	Institution	Role
2023-Present	Moffitt Cancer Center	Co-Chair, Junior Scientist Partnership Awards
2025-2028	American Cancer Society	Postdoctoral Fellowship Cell Biology & Immunology (PF CBI) peer review committee (PRC)
2017-Present	Melanoma Research Foundation	Member, Grant review panel
2026	Melanoma Research Alliance	Ad Hoc, grant review committee
2025	American Cancer Society	Cancer Cell Biology (CCB) review panel
2025	National Institutes of Health	MCTB Study Section Reviewer (invited reviewer)
2024	American Cancer Society	Cancer Cell Biology (CCB) review panel
2023	National Institutes of Health	MCTB Study Section Reviewer (invited reviewer)
2022	Moffitt Cancer Center	Review Panel Member, Miles for Moffitt Awards
2022	Moffitt Cancer Center	Review Panel Member, Junior Scientist Partnership Awards

COMMITTEES:

Year	Institution/Committee	Role
2021-Present	Moffitt Education Committee	Member
2021-Present	Moffitt, Graduate Program admissions review	Member
2021-2024	Moffitt, Institutional Faculty Wellness Committee	Member
2023	Bio2 Integrated Bioinformatics Faculty Search Committee	Member
2022	Metabolism Program Co-Leader Search Committee	Member

PATENTS AND PROVISIONAL PATENT APPLICATIONS AND PATENTS

PCT/US2020/047715 Methods for diagnosis leptomeningeal metastasis (Inventor: Inna Smalley)
 24MB033PR Sodium Phenylbutyrate for the treatment of leptomeningeal disease
 24MB033PRWO Methods and compositions for treatment of branched-chain keto acid (BCKA) accumulation in cancers.

PROFESSIONAL ASSOCIATIONS

American Association for Cancer Research- Associate Member since 2009
 AACR Women in Cancer Research- Member since 2009
 Society for Melanoma Research- Member since 2011
 ARCS Foundation- Member/scholar since 2011
 President of Moffitt Cancer Center Postdoctoral Association Council Jan 2015- July 2015

Vice president of Moffitt Cancer Center Postdoctoral Association Council July 2014-Jan 2015
PanAmerican Society for Pigment Cell Research- Member since 2017

LEADERSHIP EXPERIENCE

2025-Present Associate Director, Recruitment and Engagement, Cancer PhD Program
2024-2025 Director of the Cancer Biology Major for the Moffitt Cancer PhD Program
2024-Present Member of the Board of Directors for Leptomeningeal Cancer Foundation
2024-Present Co-chair of the Moffitt Scientific Symposium
2023-Present Co-chair of the Junior Scientist Research Partnership Award

MEETINGS/RETREATS ORGANIZED

2023 Moffitt Spatial Omics Retreat
2025 PanAmerican Society for Pigment Cell Research Conference