Inna Smalley, PhD

Assistant Member, Metabolism and Physiology
Moffitt Cancer Center
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PERSONAL STATEMENT

I have over 19 years of experience studying cancer biology and 11 years of experience studying central nervous system (CNS) metastases. I have extensive expertise in studying the role of the tumor microenvironment in tumor growth and drug resistance. I have a passion for studying the biology of metastases to the leptomeninges. I have broad experience analyzing high-throughput proteomic, metabolomic, and transcriptomic datasets. I helped develop advanced bioinformatics techniques to model changes in signaling and metabolism with the goal of identifying unique vulnerabilities of subpopulations of cells. I am exploring how the tumor microenvironments among different metastatic sites facilitate metastatic spread. This includes the mechanisms supporting tumor survival on therapy and immune evasion in different microenvironments, with a special focus on tumor metabolism. As part of these efforts, I established a rapid autopsy program for patients with CNS metastatic disease from lymphoma, melanoma, and breast cancer. Furthermore, I have optimized the application of several spatial transcriptomics and single-cell analysis techniques for analyzing patient tumor specimens and cerebrospinal fluid-circulating tumor cells. I am deeply committed to mentoring early career scientists. I have previously published under my maiden name: Inna V. Fedorenko.

CURRENT POSITIONS AND AFFILIATIONS

Assistant Member, *July 2020- current*
Metabolism and Physiology (primary appointment)
H. Lee Moffitt Cancer Center and Research Institute
12902 Magnolia Drive, Tampa FL 33612

Cancer Biology Major Director, *September 2024-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- current*
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

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. Alhaddad H, Ospina OE, Khaled ML, Ren Y, Vallebuona E, Boozo 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.

2. 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. In press, Neuro-Oncology May 2024.

3. 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.

4. 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.

5. 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.**

6. 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.

7. **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.

8. 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; https://doi.org/10.3390/cancers15061884

9. **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.

10. Ospina OE, Wilson CM, Soupir 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.

11. 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.

12. 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.

13. 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.**

14. **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**.

15. Phadke, M.S., Chen, Z., Li, J., Mohamed, E., Davies, M.A., **Smalley, I.**, Duckett, D., Palve, V., Czernieck,i 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.

16. 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.

17. 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**.

18. **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.

19. 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.

20. **Smalley I**, Kim E, Li J, Spence P, Wyatt CJ, Erolgu 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.

21. 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.

22. 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.

23. **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.

24. 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.

25. 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.

26. 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

27. 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

28. 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**

29. **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.

30. 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

31. **Fedorenko IV*,** Smalley KSM. The complexity of microenvironment-mediated drug resistance. Genes Cancer. 2015 Sep;6(9-10):367-368. ***Corresponding author.**

32. **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.

33. 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 prolifetaive skin events by suppressing paradoxical MAPK activation. J Invest Derm. 2015 Oct;135(10):2542-4.

34. **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.

35. 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)

36. 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, Sloot 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.

37. **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.

38. **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.

39. **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.

40. 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

41. 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.

42. Sloot 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

43. 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.

44. 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.

45. 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.

46. **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

47. **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.

48. 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.

49. 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.

50. 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.

51. 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

CURRENT RESEARCH SUPPORT

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"
% Effort: 20%
Role in the Study: PI
Total Direct Costs: $660,000
Total Amount of Award: $ $792,000

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"
% Effort: 3%
Role in the Study: Co-Investigator
Total Direct Costs: $ 735,760
Total Amount of Award: $1,248,032

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
Funding Source: Melanoma Research Alliance
Title: "Tumor-stroma metabolic crosstalk in melanoma brain metastases"
% Effort: 7.5%
Role in the Study: PI

Total Direct Costs: $255,000
Total Amount of Award: $255,000

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"
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $61,200
Total Amount of Award: $61,200

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 "
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $50,000
Total Amount of Award: $ 50,000

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"
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $50,000
Total Amount of Award: $ 50,000

PAST RESEARCH SUPPORT

R21 (PI: Inna Smalley)
Account #: 10-22019-99-01
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"
% Effort: 7.5%
Role in the Study: PI
Total Direct Costs: $257,125
Total Amount of Award: $463,375

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.”
% Effort: R00 phase 75% (down to 62% in NCE)
Role in the Study: PI
Total Direct Costs: $453,552
Total Amount of Award: $ 747,000

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 "
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $50,000
Total Amount of Award: $57,500

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"
% Effort: 2%
Role in the Study: PI
Total Direct Costs: $75,000
Total Amount of Award: $86,250

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"
% Effort: 5%
Role in the Study: PI
Total Direct Costs: $75,000
Total Amount of Award: $ 75,000

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.”
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $30,287
Total Amount of Award: $30,287

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."
% Effort: 5%
Role in the Study: PI
Total Direct Costs: $ 75,000
Total Amount of Award: $ 75,000

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."
% Effort: 5%
Role in the Study: PI
Total Direct Costs: $ Total Award: $250,017
Total Amount of Award: $287,520

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."
% Effort: 5%
Role in the Study: PI
Total Direct Costs: $83,333
Total Amount of Award: $100,000

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."
% Effort: 1%
Role in the Study: PI
Total Direct Costs: $33,000
Total Amount of Award: $33,000

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."

% Effort: K99 phase 100%
Role in the Study: PI
Total Direct Costs: $182,168
Total Amount of Award: $192,742

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
% Effort: 50%
Role in the Study: PI
Total Direct Costs: $100,000
Total Amount of Award: $100,000

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
% Effort: N/A
Role in the Study: PI
Total Direct Costs: $10,000
Total Amount of Award: $10,000

PENDING RESEARCH SUPPORT

Title: 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)
Project/Proposal Start and End Date: 09/01/2025 – 08/31/2029
Total Award Amount (Including Indirect Costs): $ 18,711,709

Title: Branched-chain keto acid accumulation is a targetable vulnerability of leptomeningeal disease
Project Number: R01
Name of PD/PI: Smalley, I.
Source of Support: NIH/NCI
Project/Proposal Start and End Date: 04/01/2025 – 03/31/2030
Total Award Amount (Including Indirect Costs): $ 3,952,968

Title: Disrupting the tumor-promoting interactions in melanoma leptomeningeal disease
Name of PD/PI: Smalley, I.
Source of Support: Department of Defense CDMRP Melanoma Research Program Melanoma Academy Scholar Award
Project/Proposal Start and End Date: 06/01/2025 – 05/31/2028
Total Award Amount (Including Indirect Costs): $ 886,202

Title: Cellular and evolutionary atlas of leptomeningeal disease
Name of PD/PI: Smalley, I.

Source of Support: Florida Cancer Innovation Fund, State of Florida
Project/Proposal Start and End Date: July 2025 – June 2026
Total Award Amount (Including Indirect Costs): $676,746

Title: Understanding how tumor cells co-opt meningeal stroma in melanoma leptomeningeal disease
Name of PD/PI: Smalley, I.
Source of Support: Florida Biomedical Research Program (FBRP), Bankhead-Coley Cancer Research Program
Project/Proposal Start and End Date: 04/01/2025 – 03/31/2028
Total Award Amount (Including Indirect Costs): $ 600,000

INVITED ORAL PRESENTATIONS/SESSION CHAIR/THINK TANK PARTICIPANT:

1. Derm Scholars Lecture Series. "The Current State of Melanoma Research." University of South Florida, April 7th 2025.

2. 11th World Congress of Melanoma in conjunction with the 21st EADO Congress. Athens, Greece April 3-5th 2025.

3. 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.

4. 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 2025.

5. 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.

6. RANO-Leptomeningeal Metastasis Participant at the EANO. Glasgow October 19th, 2024.

7. Session Chair for the 21st Annual Meeting of the Society for Melanoma Research (SMR Congress). New Orleans, Luisiana, October 10-13th 2024.

8. Session Chair and invited speaker, Melanoma: From Prevention to Therapy. 2024 PanAmerican Society for Pigment Cell Research Meeting, New York City, NY, September 2024.

9. 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.

10. Workshop on Melanoma Models and Translational Oncology. "Utilizing single-cell transcriptomics analysis to understand the biology of melanoma at different metastatic sites." Sao Paolo, Brazil on July 10th, 2024

11. 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.

12. "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.

13. 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.

14. Central Florida Triangle Metabolism Meeting, Metabolism and Physiology, St. Petersburg, Florida, March 2023. "Metabolism of leptomeningeal disease."

15. Society for Neuro-oncology Symposium on Therapeutic Development, Tampa, Florida, November 2023. "Understanding the cellular and metabolic landscape of lymphoma leptomeningeal disease."

16. Single Cell Genomics Symposium. Tampa, FL, August 2022. "Utilizing single-cell transcriptomics analysis to understand the unique microenvironment of leptomeningeal metastasis."

17. 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."

18. 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..

19. 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.

20. 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.

21. MRF Sponsored Second Summit on Melanoma Central Nervous System (CNS) Metastases. February 2018, Tampa, Florida. "The leptomeningeal microenvironment as protective sanctuary for melanoma cells."

22. 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"

23. 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"

24. "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.

25. **"**Aggressive melanomas establish a protective niche in response to drug therapies." St. Jude National Graduate Student Symposium (NGSS), 26-29 March 2013, Memphis, TN.

26. "Melanomas establish a protective niche in response to drug therapies." Society for Melanoma Research Congress November 8th 2012. Received Best Oral Presentation Award.

27. "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

GRADUATE TRAINEES:

Year	Name	Trainee Role	Current Position
2024-Present	Debora Colodete	Graduate Student	Graduate Student at USF
2024-Present	Taryn Rauff	Graduate Student	Graduate Student at USF
2023-Present	Ethan Vallebuona	Graduate Student	Graduate Student at Moffitt
2023	Karl Nyman	Rotation Student	PhD Candidate at Moffitt
2022	Achintyan Gangadharan	Rotation Student	PhD Candidate at Moffitt
2020-2021	Darwin Chang	Rotation Student	PhD Candidate at Moffitt
2017-2020	Chao Zhang	Graduate Student (co-mentored)	Postdoc in Spain

UNDERGRADUATE TRAINEES:

Year	Name	Trainee Role	Current Position
2024-Present	Poojitha Swaminathan	Undergrad Intern	Undergraduate Student at USF
2024	Chinaza Munonye	Undergrad Mentee	Undergraduate Student at USF

POSTDOC TRAINEES:

Year	Name	Trainee Role	Current Position
2021-2024	Hasan Alhaddad	T32 Postdoc	Assistant Professor at USF
2020-2023	Oscar Ospina	T32 Postdoc	Promoted to Research Scientist
2020-Present	Mariam Khaled	Postdoc	Postdoc

STAFF SCIENTISTS:

Year	Name	Trainee Role	Current Position
2021-Present	Yuan Ren	Research Scientist	Research Scientist
2020-2021	Kathy McGraw	Research Scientist	Staff Scientist at NCI

VISITING SCHOLARS/OTHER:

Year	Name	Trainee Role

2023-2025	Mohammad Baraa Boozo	International Visiting Scholar
2022-2023	Ronak Kundalia	Post Master's/Pre-med trainee

PHD THESIS COMMITTEE MEMBER:

Year	**Student Name**
2023-present	Olabisi Osunmakindeo
2023-present	Nicol Mecozzi
2023-present	Karl Nyman

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
2017-Present	Melanoma Research Foundation	Member, Grant review panel
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

PROVISIONAL PATENT APPLICATIONS AND PATENTS

PCT/US2020/047715 Methods for diagnosis leptomeningeal metastasis (Inventor: Inna Smalley)
24MB033PR: SODIUM PHENYLBUTYRATE FOR TREATMENT OF LEPTOMENINGEAL DISEASE

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

2024-Present 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 (organization in progress)