OMB No. 3145-0279 (Expiration Date 10/31/2026)

NIH BIOGRAPHICAL SKETCH COMMON FORM

Name: DIFEO, ANALISA

Persistent Identifier (PID) of the Senior/Key Person: https://orcid.org/0000-0001-8319-6763

Position Title: Professor (with Tenure)

Organization and Location: Department of Pathology, University of Michigan , Ann Arbor, Michigan, United States

PROFESSIONAL PREPARATION

INSTITUTION AND LOCATION	DEGREE	Start Date	Completion Date	FIELD OF STUDY
Mount Sinai School of Medicine, New York, NY, New York, United States	Postdoctoral Fellow	03/2008	07/2010	Cancer Biology
Icahn School of Medicine at Mount Sinai, New York, , New York, United States	Doctor of Philosophy (PHD)	06/2004	03/2008	Cancer Genetics/Cancer Biology
State University of New York at Binghamton, Binghamton, NY, New York, United States	Bachelor of Science (BS)	09/1997	05/2001	Biochemistry

Appointments and Positions

2024 - present	Professor (with Tenure), Department of Pathology, University of Michigan , Ann Arbor, Michigan, United States
2024 - present	Professor, Dept. of Obstetrics and Gynecology, University of Michigan , Ann Arbor, Michigan, United States
2023 - present	Associate Director , Cancer Biology Graduate Program, University of Michigan, Ann Arbor, Michigan, United States
2022 - present	Director, Michigan Ovarian cancer and Innovation Consortium (MOSAIC), University of Michigan, Ann Arbor, Michigan, United States
2018 - 2024	Associate Professor (with tenure),, Department of Pathology, University of Michigan, , Ann Arbor, Michigan, United States
2018 - 2024	Associate Professor, , Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan, United States
2016 - 2018	Director, Xenograft and Preclinical Therapeutics Core, Case Western Cancer Center, Cleveland, Ohio, United States
2014 - 2018	Norma C. and Albert I. Geller Designated Professor in Ovarian Cancer Research, Case Western Reserve University School of Medicine, , Cleveland, Ohio, United States
2014 - 2018	Assistant Professor, Department of Genetics and Genome Sciences, Case Western Reserve University School of Medicine, Cleveland, Ohio, United States
2013 - 2018	Director, Gynecologic Oncology Translational Research Group, Case Comprehensive Cancer Center, Case Western Reserve University,, Cleveland, Ohio, United States
2012 - 2018	Assistant Professor, Division of General Medical Sciences (Oncology), Department of Medicine, Case Western Reserve University School of Medicine, , Cleveland, Ohio, United States
2010 - 2012	Instructor, Mount Sinai School of Medicine,, New York, NY, New York, United States

Products

Products Closely Related to the Proposed Project

1. McIntyre G, Jackson Z, Colina J, Sekhar S, DiFeo A. miR-181a: regulatory roles, cancer-associated signaling pathway disruptions, and therapeutic potential. Expert Opin Ther Targets. 2024 Dec;28(12):1061-1091. PubMed Central PMCID: PMC12054384.
2. Belur Nagaraj A, Knarr M, Sekhar S, Connor RS, Joseph P, Kovalenko O, Fleming A, Surti A, Nurmemmedov E, Beltrame L, Marchini S, Kahn M, DiFeo A. The miR-181a-SFRP4 Axis Regulates Wnt Activation to Drive Stemness and Platinum Resistance in Ovarian Cancer. Cancer Res. 2021 Apr 15;81(8):2044-2055. PubMed Central PMCID: PMC8137569.
3. Knarr M, Avelar RA, Sekhar SC, Kwiatkowski LJ, Dziubinski ML, McAnulty J, Skala S, Avril S, Drapkin R, DiFeo A. miR-

181a initiates and perpetuates oncogenic transformation through the regulation of innate immune signaling. Nat Commun. 2020 Jun 26;11(1):3231. PubMed Central PMCID: PMC7320168.

4. Parikh A, Lee C, Joseph P, Marchini S, Baccarini A, Kolev V, Romualdi C, Fruscio R, Shah H, Wang F, Mullokandov G, Fishman D, D'Incalci M, Rahaman J, Kalir T, Redline RW, Brown BD, Narla G, DiFeo A. microRNA-181a has a critical role in ovarian cancer progression through the regulation of the epithelial-mesenchymal transition. Nat Commun. 2014;5:2977. PubMed Central PMCID: PMC3896774.
5. Colina JA, Recouvreux MS, Sobeck AM, Johnson BK, Lin Y, Sekhar SC, Avelar RA, Rivera-Gonzalez G, Zhai Y, Ram H, Fatima A, DiBenedetto P, Baldassarre J, McIntyre G, Teitel J, Dziubinski ML, Puleo N, Miglo J, Bedi K, Shen H, Thomas D, Huvila J, Cochrane DR, Drapkin R, Lei YL, Burdette JE, Skala SL, Huntsman DG, Cho KR, Orsulic S, DiFeo A. Ciliated Cells Drive Critical STING-Mediated Tumor Suppression in the Fallopian Tube Epithelium. Cancer Res. 2026 Jun 15;86(12):2878-2895. PubMed Central PMCID: PMC13105266.

Other Significant Products Highlighting Contributions to Science

1. Avelar RA, Gupta R, Carvette G, da Veiga Leprevost F, Colina J, Teitel J, Nesvizhskii AI, O'Connor CM, Hatzoglou M, Shenolikar S, Arvan P, Narla G, DiFeo A. Integrated stress response plasticity governs normal cell adaptation to chronic stress via the PP2A-TFE3-ATF4 pathway. Res Sq. 2024 Mar 28; PubMed Central PMCID: PMC10996823.
2. Avelar RA, Armstrong AJ, Carvette G, Gupta R, Puleo N, Colina JA, Joseph P, Sobeck AM, O'Connor CM, Raines B, Gandhi A, Dziubinski ML, Ma DS, Resnick K, Singh S, Zanotti K, Nagel C, Waggoner S, Thomas DG, Skala SL, Zhang J, Narla G, DiFeo A. Small-Molecule-Mediated Stabilization of PP2A Modulates the Homologous Recombination Pathway and Potentiates DNA Damage-Induced Cell Death. Mol Cancer Ther. 2023 May 4;22(5):599-615. PubMed Central PMCID: PMC10157366.
3. O'Connor CM, Leonard D, Wiredja D, Avelar RA, Wang Z, Schlatzer D, Bryson B, Tokala E, Taylor SE, Upadhyay A, Sangodkar J, Gingras AC, Westermarck J, Xu W, DiFeo A, Brautigan DL, Haider S, Jackson M, Narla G. Inactivation of PP2A by a recurrent mutation drives resistance to MEK inhibitors. Oncogene. 2020 Jan;39(3):703-717. PubMed Central PMCID: PMC6980487.
4. Belur Nagaraj A, Kovalenko O, Avelar R, Joseph P, Brown A, Surti A, Mantilla S, DiFeo A. Mitotic Exit Dysfunction through the Deregulation of APC/C Characterizes Cisplatin-Resistant State in Epithelial Ovarian Cancer. Clin Cancer Res. 2018 Sep 15;24(18):4588-4601. PubMed Central PMCID: PMC6139058.
5. Puleo N, Ram H, Dziubinski ML, Carvette D, Teitel J, Sekhar SC, Bedi K, Robida A, Nakashima MM, Farsinejad S, Iwanicki M, Senkowski W, Ray A, Bollerman TJ, Dunbar J, Richardson P, Taddei A, Hudson C, DiFeo A. Identification of a TNIK-CDK9 Axis as a Targetable Strategy for Platinum-Resistant Ovarian Cancer. Mol Cancer Ther. 2025 Apr 2;24(4):639-656. PubMed Central PMCID: PMC11962390.

Certification:

I certify that the information provided is current, accurate, and complete. This includes, but is not limited to, information related to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

In accordance with Section 10632 of the CHIPS and Science Act of 2022 (42 U.S.C. § 19232), each individual identified as a senior/key person must certify that they are not a party to a malign foreign talent recruitment program.

Research Security Training Requirement for Federal Award Personnel: In accordance with Section 10634 of the CHIPS and Science Act of 2022 (42 U.S.C. § 19234), each individual identified as a senior/key person must certify that they have completed the requisite research security training that meets the requirements specified in Item 2 of Important Notice No. 149 within 12 months prior to proposal submission.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§287, 1001, 1031 and 31 U.S.C. §§3729-3733 and 3802.

Certified by DIFEO, ANALISA in SciENcv on 2026-08-05 12:29:00

NIH BIOGRAPHICAL SKETCH SUPPLEMENT

Name: DIFEO, ANALISA

Persistent Identifier (PID) of the Senior/Key Person: https://orcid.org/0000-0001-8319-6763

Position Title: Professor (with Tenure)

Organization and Location: Department of Pathology, University of Michigan , Ann Arbor, Michigan, United States

Personal Statement

Throughout my career, I have been committed to advancing translational research in gynecologic cancers through discoveries that improve outcomes for women with ovarian and uterine cancer. I have a broad background in cancer genetics and biology, with expertise in microRNA biology, chemotherapy resistance, tumor initiation, and the development of clinically relevant patient-derived models. For more than 20 years, my laboratory has integrated molecular studies of patient tumors with functional investigations of key genetic drivers to identify novel therapeutic targets and biomarkers. Our research focuses on four complementary areas: (1) development of clinically relevant gynecologic cancer models; (2) identification of genetic and microRNA drivers of tumor initiation, drug resistance, and recurrence; (3) development of novel and repurposed therapeutic strategies; and (4) discovery of biomarkers for early detection and treatment response.

My laboratory has been continuously funded since 2006 by federal agencies, foundations, and industry partners, and we have published more than 90 peer-reviewed manuscripts, including an article recently recognized by the American Association for Cancer Research as an Outstanding Journal Article. Through longstanding collaborations with clinicians and scientists, I have established multiple translational research programs in New York, Cleveland, and Michigan. I currently serve as Director of the Michigan Ovarian Cancer Science and Innovation Consortium (MOSAIC) and co-PI of the gynecologic cancer tumor repository. These efforts have generated a unique repository of more than 800 clinically annotated ovarian and uterine tumors and numerous patient-derived models that faithfully recapitulate the molecular and phenotypic characteristics of the original tumors. These resources have enabled the discovery of novel biomarkers, therapeutic targets, and treatment strategies for gynecologic cancers.

My scientific expertise and mentoring experience are directly relevant to Grace McIntrye's proposed research which will advance the biochemical, biophysical, and functional characterization of first-in-class small-molecule inhibitors of miR-181a (SMIR-181s) to establish a clinically translatable miR-181a-targeted therapeutic strategy for cancer. My laboratory’s strengths in microRNA's, drug development, and cancer biology will support her investigation of how SMIR-181s directly interact with TARBP2 to abrogate pre-miR181a processing. Grace's project builds on this foundation and leverages the laboratory's unique biospecimen repository, experimental models, and multidisciplinary collaborations. Through individualized mentorship, I will guide her scientific development while fostering independence in experimental design, critical thinking, scientific communication, and grant writing.

Mentoring the next generation of cancer scientists is one of my highest professional priorities. I have mentored 66 trainees, served on 32 MD/PhD or PhD dissertation committees, and currently serve on 13 dissertation committees (8 of which I am Chair). I am the Associate Director of the Cancer Biology Graduate Program and chair of its admissions committee, Director of the Training Program in the Tumor Microenvironment (T32), and a participating faculty member in five graduate programs. These roles reflect my deep commitment to mentoring and advancing graduate education.

Honors

2025	MICHR Distinguished Clinical and Translational Research Mentor Award,, Michigan Medicine, University of Michigan, Ann Arbor, MI
2025	2025 Molecular Cancer Therapeutics Award for Outstanding Journal Article, American Association of Cancer Research
2024	Rogel Scholar, Michigan Medicine, University of Michigan, Ann Arbor, MI
2016	Spark Speaker at Annual Conference, Healthcare Businesswomen’s Association
2016	The Nsoroma Science Award, National Technical Association, Cleveland Chapter
2014	Norma C. and Albert I. Geller Designated Professor in Ovarian Cancer Research, Case Western Reserve University
2014	Crain’s Forty Under 40, Crain’s Cleveland Business, Cleveland, OH
2010	Liz Tilberis Scholar Award, Ovarian Cancer Research Alliance
2008	AstraZeneca Scholar-in-Training Award, American Association of Cancer Research

2008 Terry Krulwich Best Doctoral Dissertation Award, Mount Sinai School of Medicine

Contributions to Science

1. Tumor Suppressor Networks and Oncogenic Signaling in Cancer Development, Progression and Therapeutic Resistance: My research has significantly advanced the understanding of key tumor suppressors—including Kruppel-like factor 6 (KLF6), protein phosphatase 2A (PP2A), and their splice variants—as well as their integration with proto-oncogenes (e.g., MYC) and cancer-associated microRNAs (notably miR-181a). Through a combination of mechanistic studies and functional genomics, I have helped elucidate how genetic alterations and deregulation of these pathways drive cancer development, progression, metastasis, and therapy resistance, particularly in ovarian, prostate, and liver cancers. These findings also underscore new vulnerabilities, such as alternative splicing events or phosphatase mutations, as precise intervention points, paving the way for targeted therapeutic strategies.

2. Therapeutic Target Discovery, Drug Development, and Precision Oncology in Patient Models: I have developed and leveraged a wide array of state-of-the-art patient-derived models—including cell lines, xenografts, and novel immunodeficient rat platforms—to interrogate cancer biology and bridge bench-to-bedside translation. My work helped uncover new therapeutic targets (e.g., PP2A activators, TNIK-CDK9 axis, miR-181a inhibitors), define genomic and metabolic contributors to drug resistance (platinum, PARP, and kinase inhibitors), and employ computational and systems-level approaches for repurposing drugs and stratifying patient response. These contributions have directly informed preclinical pipelines and provided mechanistic underpinnings for emergent precision therapeutic strategies in gynecologic and solid tumors.

3. Cancer Microenvironment and Systems Approaches: My laboratory has explored how the tumor microenvironment—including metabolic rewiring, stromal/immune cell interactions, and biomechanical cues—affects cancer progression, stemness, recurrence, and treatment response. We have characterized the contribution of metabolic pathways (e.g., glutamine metabolism, MTHFD2 dependence), mechanical forces (ascitic shear), and immune signaling (STING pathway, immune memory) in modulating tumor phenotypes and resistance landscapes. Furthermore, we utilize advanced computational and systems biology tools to uncover network vulnerabilities and guide the rational design of combination therapies.

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