BIOGRAPHICAL SKETCH

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NAME: Ganesan, Shridar

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POSITION TITLE: Professor of Medicine & Associate Director of Translational Science

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Princeton University, New Jersey	A.B.	06/1985	Chemistry
Yale University, Connecticut	M.D.	06/1993	
Yale University, Connecticut	Ph.D.	06/1993	Cell Biology

A. Personal Statement

I am a physician/scientist with a strong background in clinical oncology, strong training in basic molecular cancer research and a focus on translational science. My laboratory work is focused on characterizing DNA repair abnormalities in cancer and identifying genomic and epigenetic markers of response and resistance to cancer therapy. I am the Associate Director of Translational Science and have great experience in molecular and genomic analysis of primary tumor tissues from both human cancer and mouse models. As Program Co-Leader of the Clinical Investigations and Precisions Therapeutics program, I am also very involved in genomic and molecular analysis of samples from early phase clinical trials. I also lead the Precision Oncology efforts at our institute, which includes organizing and implementing the Molecular Tumor Board. I am committed to education and have served as research mentor for a range of trainees from high school students to post-doctoral fellows. I have experience in mentoring trainees in both wet lab and computational genomics.

Ongoing and recently completed projects that I would like to highlight include:

R01 CA243547
Ganesan; White; Lattime (MPI)
12/01/2019-11/30/2024
Impact of Mutation Burden on Cancer Growth and the Immune Landscape

P01CA250957
(Contact PI; Shen, Project 3 PI; Ganesan)
05/01/2021-04/31/2026
Mechanisms of the BRCA-network in tumorigenesis and therapeutic response,

R01 CA202752-01
Ganesan; Madabhushi (MPI)
07/01/2016-06/30/2021
Computerized histologic image predictor of cancer outcome

NOVA Award/ ORIEN/M2GEN
Ganesan (PI)
06/25/2019-06/30/2023

Chromatin abnormalities and endogenous retrovirus expression as a novel biomarker of response to immune checkpoint therapy in low mutation burden cancers

P30 CA072720
Libutti (PI)
03/01/2019-02/29/2024
Cancer Center Support Grant (CCSG)

1R01CA233662
Khiabanian (PI)
04/01/2019-03/31/2024
Evolution and clinical impact of clonal hematopoiesis of indeterminate potential in breast tumor Microenvironment

R01CA204516-01A1
Contact PI Pasqualini; Arap; Libutti (MPI)
04/01/2020-03/31/2025
Designing a transcriptome-based, targeted theranostic platform for prostate cancer

R01GM129066-01A1
Dey (PI)
04/01/2019-03/31/2024
Computational approaches for identifying epigenomic contexts of somatic mutations

R01LMO1323601-01A1
Mitrofanova (PI)
09/09/2020-08/31/2024
Generalizable biomedical informatics strategies for predictive modeling of treatment response

W81XWH-20-BCRP-BTA12-2
Ganesan;Liotta (MPI)
10/01/2020-09/30/2023
Quantitative HER2 pathway activation assay for prediction of therapeutic response

Citations:

1. Na, B., Yu, X., Withers, T., Gilleran, J., Yao, M., Foo, T. K., Chen, C., Moore, D., Lin, Y., Kimball, S. D., Xia, B., **Ganesan, S**.,** and Carpizo, D. R** Therapeutic targeting of BRCA1 and TP53 mutant breast cancer through mutant p53 reactivation. NPJ breast cancer. 2019 PMID: 30993195 PMCID: PMC6465291
2. Bouwman P, Amal A, Escandell P, Pieterse M, Bartkova J, van der Gulden H, Hiddingh S, Thanasoula M, Kulkarni A, Yang Q, Haffty BG, Tommiska J, Blomqvist C, Drapkin R, Adams DJ, Nevanlinna H, Bartek J, Tarsounas M**, **Ganesan S,**** and Jonkers J,** 53BP1 loss abrogates DNA damage responses in *Brca1* null cells and is associated with triple-negative and BRCA-mutated breast cancers. Nature Struc Molec Bio 2010. 17(6):688-95. PMCID: PMC2912507.
3. Sokol ES, Pavlick D, Khiabanian H, Frampton GM, Ross JS, Gregg JP, Lara PN, Oesterreich S, Agarwal N, Necchi A, Miller VA, Alexander B, Ali SM, Ganesan S, Chung JH. Pan-Cancer Analysis of *BRCA1* and *BRCA2* Genomic Alterations and Their Association With Genomic Instability as Measured by Genome-Wide Loss of Heterozygosity. JCO Precis Oncol. 2020;4:442-465. doi: 10.1200/po.19.00345. Epub 2020 Apr 30. PMID: 32903788; PMCID: PMC7446440.

B. Positions, Scientific Appointments, and Honors

2019 – Present	Professor, Rutgers Cancer Institute of New Jersey
2016	Hero Award, Triple Negative Breast Cancer Foundation
2015	Omar Boraie Endowed Chair in Genomic Science

2014	Award of Hope for Leadership in Research and Patient Care, Rutgers CINJ
2013 – Present	Associate Director for Translational Science, Rutgers Cancer Institute of New Jersey
2013 – 2019	Associate Professor, Rutgers Cancer Institute of New Jersey
2006 – Present	Staff Physician, Robert Wood Johnson University Hospital, New Brunswick, NJ
2006	Kimmel Scholar Award, Sidney Kimmel Foundation
2005 – 2012	Assistant Professor, Cancer Institute of New Jersey and UMDNJ-RWJMS
2004	Howard Temin Award, National Cancer Institute
1999 – 2005	Staff Physician, Brigham and Women's Hospital, Boston MA
1999 – 2005	Staff Physician, Dana-Farber Cancer Institute, Boston, MA
1999 – 2005	Instructor in Medicine, DFCI and Harvard Medical School
1999	Howard Hughes Medical Institute Postdoctoral Research Fellowship
1998 – 1999	Fellow in Oncology, Dana-Farber Cancer Institute
1997 – 1998	Chief Medical Resident, BWH
1996 – 1997	Clinical Fellow in Oncology, Dana-Farber Cancer Institute
1996	Chief Medical Resident, Brigham and Women's Hospital
1995 – 1996	Senior Assistant Resident, Internal Medicine, BWH
1994 – 1995	Junior Assistant Resident, Internal Medicine, BWH
1994	Campbell Prize for Academic Achievement, Yale University
1993 – 1994	Intern in Medicine, Brigham and Women's Hospital (BWH)
1993	M.D. granted cum laude, Yale University
1993	M.D., Ph.D. Thesis Prize, Yale University
1992	Yale Physician Associate Program Outstanding Pre-Clinical Lecturer Award
1992	AFCR Medical Student Award for Excellence
1985	A.B. granted summa cum laude from Princeton University
1985	Elected to Phi Beta Kappa, Princeton University
1985	R.T. McKay Prize in Chemistry, Princeton University

C. Contributions to Science

1. My initial post-doctoral work was with Dr. David Livingston and focused on basic biology of the BRCA1 tumor suppressor. Our work led to the initial characterization of BRCA1 as a nuclear, cell cycle regulated protein that was involved in DNA double strand break repair. We also identified a novel role for its activity being required for maintenance of heterochromatin regions including the inactive X chromosome. In addition, I contributed to characterization of BRCA1-associated proteins.

    a. Scully R, **Ganesan S**, Brown M, De Caprio JA, Cannistra SA, Feunteun J, Schnitt S, Livingston DM. Location of BRCA1 in human breast and ovarian cancer cells. Science 1996; 272:123-125. PMID: 8600523
    b. Scully R*, **Ganesan S****, Vlasakova K, Chen J, Socolovsky M, Livingston DM. Genetic analysis of BRCA1 function in a defined tumor cell line. Mol Cell 1999; 4:1093-1099. PMID: 10635334
    c. Garcia-Higuera I, Taniguchi T, **Ganesan S**, Meyn MS, Timmers C, Hejna J, Grompe M, D'Andrea AD. Interaction of the Fanconi anemia proteins and BRCA1 in a common pathway. Mol Cell 2001 7:249-262. PMID: 11239454
    d. **Ganesan S**, Silver DP, Greenberg RA, Avni D, Drapkin R, Miron A, Mok SC, Randrianarison V, Brodie S, Salstrom J, Rasmussen TP, Klimke A, Marrese C, Marahrens Y, Deng C-X, Feunteun J, Livingston DM. BRCA1 Supports XIST RNA Concentration on the Inactive X Chromosome. Cell 2002; 111: 393-405. PMID: 12419249

2. Since starting my laboratory at the Cancer Institute of New Jersey, I have continued to work on the biology of BRCA1. We recently discovered that loss of 53BP1 could partially rescue the DNA repair defect present in BRCA1-mutant cancer cells. This has led to new insight into how BRCA1 and 53BP1 work as competing regulators of DNA repair choice. Moreover, loss of 53BP1 can be a mechanism of acquired resistance to PARP inhibitors in BRCA1 mutant cancers.

    1. Bouwman P, Amal A, Escandell P, Pieterse M, Bartkova J, van der Gulden H, Hiddingh S, Thanasoula M, Kulkarni A, Yang Q, Haffty BG, Tommiska J, Blomqvist C, Drapkin R, Adams DJ, Nevanlinna H, Bartek J, Tarsounas M, **Ganesan S,****** and Jonkers J,** 53BP1 loss abrogates DNA damage responses in *Brca1* null cells and is associated with triple-negative and BRCA-mutated breast cancers. Nature Struc Molec Bio 2010. 17(6):688-95. PMCID: PMC2912507.

2. Jaspers JE, Kersbergen A, Boon U, Sol W, van Deemter L, Zander SA, Drost R, Wientjens E, Ji J, Aly A, Doroshow JH, Cranston A, Martin NM, Lau A, O'Connor MJ, **Ganesan S**, Borst P, Jonkers J, Rottenberg S. Loss of 53BP1 causes PARP inhibitor resistance in Brca1-mutated mouse mammary tumors. Cancer Discov. 2013 Jan;3(1):68-81. PMID: 23103855; PMCID: PMC7518105.
3. Neboori HJ, Haffty BG, Wu H, Yang Q, Aly A, Goyal S, Schiff D, Moran MS, Golhar R, Chen C, Moore D, **Ganesan S.** Low p53 Binding Protein 1 (53BP1) Expression Is Associated with Increased Local Recurrence in Breast Cancer Patients Treated with Breast-Conserving Surgery and Radiotherapy. Int J Radiat Oncol Biol Phys. 2012 PMID: 22520477.
4. Anantha RW, Simhadri S, Foo TK, Miao S, Liu J, Shen Z, **Ganesan S**, Xia Functional and mutational landscapes of BRCA1 for homology-directed repair and therapy resistance. eLife 2017 Apr 11;6. pii: e21350. doi: 10.7554/eLife.21350. PMID: 28398198; PMCID: PMC5432210 2017.

3. Our laboratory has also continued to work on the link between transcriptional silencing and DNA repair. We have found that the polycomb protein BMI and the histone methy transferase G9a/EHMT2 plays a novel role in ATM-mediated DNA repair pathway, and have identified the transcriptional co-repressor TRIM33 as being a key component of the PARP-dependent DNA repair pathway

   a. Ginjala, V, Nacerddine, K, Kulkarni, A, Oza, J, Hill, S.J, Yao, M, Citterio, E, van Lohuizen, M, and **Ganesan, S**. BMI1 is recruited to DNA breaks and contributes to DNA damage induced H2A ubiquitination and repair. Mol Cell Biol. 2011 31(10) 1972-82. PMID:21383063. PMCID: PMC3133356.
   b. Kulkarni A, Oza J, Yao M, Sohail H, Ginjala V, Tomas-Loba A, Horejsi Z, Tan AR, Boulton SJ, **Ganesan S**. Tripartite motif-containing 33 (TRIM33) functions in the Poly(ADP-ribose)polymerase (PARP)-dependent DNA damage response through interaction with Amplified in Liver Cancer-1 (ALC1). J Biol Chem. 2013 288(45): 32357-69. PMID: 23926104; PMCID:PMC3820871
   c. Oza J, Ganguly B, Kulkarni A, Ginjala V, Yao M, **Ganesan S.** A Novel Role of Chromodomain Protein CBX8 in DNA Damage Response. J Biol Chem. 2016 Oct 28;291(44):22881-22893. PMID: 27555324;PMCID:PMC5087711
   d. Ginjala V, Rodriguez-Colon L, Ganguly B, Gangidi P, Gallina P, Al-Hraishawi H, Kulkarni A, Tang J, Gheeya J, Simhadri S, Yao M, Xia B, **Ganesan S**. Protein-lysine methyl-ransferases G9a and GLP1 promote responses to DNA damage. Sci. Rep. 30;7(1):16613. PMID:29192276 PMCID:PMC5709370 2017

4. As leader of the precision oncology program, my laboratory has used clinical sequencing data to identify markers of response and resistance to therapy, develop methods to identify presence of LOH in tumor suppressors, and found that most mutations in TET2 and DMT3A found in solid tumor sequencing do not represent tumor cell alterations but instead the presence of co-existing clonal hematopoiesis.

   a. Richardson AL, Wang ZC, DeNicolo A, Brown M, Miron A, Liao X, Iglehart JD, Livingston DM, **Ganesan S**. X chromosomal abnormalities in basal-like human breast cancer. Cancer Cell, 2006; 9(2):121-132. PMID: 16473279
   b. Khiabanian H, Hirshfield KM, Goldfinger M, Bird S, Stein S, Aisner J, Toppmeyer D, Wong S, Chan N, Dhar K, Gheeya J, Vig H, Hadigol M, Pavlick DC, Ansari S, Ali S, Xia B, Rodriguez-Rodriguez L, and **Ganesan S**. JCO Precision Oncology. Inference of Germline Mutational Status and Evaluation of Loss of Heterozygosity in High-Depth, Tumor-Only Sequencing Data. JCO Precision Oncology. DOI: 10.1200/PO.17.00148. 2018. PMID: 30246169. PMCID: PMC6148761.
   c. Kulkarni A, Al-Hraishawi H, Simhadri S, Hirshfield KM, Chen S, Pine S, Jeyamohan C, Sokol L, Ali S, Teo ML, White E, Rodriguez-Rodriguez L, Mehnert JM, **Ganesan S.** BRAF Fusion as a Novel Mechanism of Acquired Resistance to Vemurafenib in BRAFV600E Mutant Melanoma. Clin Cancer Res. 2017 Sep 15;23(18):5631-5638. doi: 10.1158/1078-0432.CCR-16-0758. Epub 2017 May 24.PMID:28539463
   d. Severson EA, Riedlinger GM, Connelly CF, Vergilio JA, Goldfinger M, Ramkissoon S, Frampton GM, Ross JS, Fratella-Calabrese A, Gay L, Ali S, Miller V, Elvin J, Hadigol M, Hirshfield KM, Rodriguez-Rodriguez L, **Ganesan S****, Khiabanian H**. Detection of clonal hematopoiesis of indeterminate potential in clinical sequencing of solid tumor specimens. Blood.doi: 10.1182/blood-2018-03-840629. PMID: 29678827; PMCID: PMC5981171 2018

5. Another ongoing focus in our laboratory has been use of genomic approaches to identify markers of response to immune checkpoint blockade (ICB) in human cancer. We identified cancers harboring mutations in POLE as a set of microsatellite-stable cancers that have exceptional response to ICB. We also identified new markers of response to ICB in low mutation burden cancers, including EBV infection in micro-satellite stable gastric cancers, and ERV expression in renal cancer.

    a. Mehnert JM, Panda A, Zhong H, Hirshfield K, Damare S, Lane K, Sokol L, Stein MN, Rodriguez-Rodriquez L, Kaufman HL, Ali S, Ross JS, Pavlick DC, Bhanot G, White EP, DiPaola RS, Lovell A, Cheng J, **Ganesan S.** Immune activation and response to pembrolizumab in POLE-mutant endometrial cancer. J Clin Invest. 2016 May 9. [Epub ahead of print] PMID:27159395; PMCID:PMC4887167 2016.
    b. Panda, A., Betigeri, A., Subramanian, K., Ross, J.S., Pavlick, D.C., Ali, S., Markowski, P., Silk, A.W., Kaufman, H.L., Lattime, E.C., Mehnert, J, Sulliven R, Lovly CR, Sosman J, Johnson DB, Bhanot G, and **Ganesan S**. (2017a). Identifying a Clinically Applicable Mutational Burden Threshold as a Potential Biomarker of Response to Immune Checkpoint Therapy in Solid Tumors. JCO Precision Oncology, DOI: 10.1200/PO.17.00146 - published online December 7, 2017. PMID: 29951597. PMCID: PMC6016848.
    c. Panda A, Mehnert JM, Hirshfield KM, Riedlinger G, Damare S, Saunders T, Kane M, Sokol L, Stein MN, Poplin E, Rodriguez-Rodriguez L, Silk AW, Aisner J, Chan N, Malhotra J, Frankel M, Kaufman HL, Ali S, Ross JS, White EP, Bhanot G, **Ganesan S**. Immune Activation and Benefit from Avelumab in EBV-Positive Gastric Cancer. J Natl Cancer Inst. 2017. PMID: 29155997; PMCID:PMC6658862. 2017
    d. Panda A, de Cubas AA, Stein M, Riedlinger G, Kra J, Mayer T, Smith CC, Vincent BG, Serody JS, Beckermann KE, **Ganesan S****, Bhanot G**, Rathmell WK**. Endogenous retrovirus expression is associated with response to immune checkpoint blockade in clear cell renal cell carcinoma. JCI Insight.;3(16). pii: 121522.doi:10.1172/jci.insight.121522. PMID: 30135306; PMCID: PMC6141170. 2018

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/shridar.ganesan.1/bibliography/43927942/public/?sort=date&direction=ascending