Srinivas Nandana, PhD

PERSONAL

Citizenship: Naturalized US Citizen
Office address: Department of Cell Biology and Biochemistry
Texas Tech University Health Sciences Center
3601 4th Street Lubbock, TX 79430-6540

Office phone: 806-743-4101
Cell: 615-430-5283
Office Fax: 806-743-2990
***e*-mail:** Srinivas.Nandana@ttuhsc.edu

EDUCATION AND TRAINING

Post-Doctoral Training
Institution and Location: Cedars-Sinai Medical Center, Los Angeles, CA
Mentor: Leland W.K. Chung, PhD
Field of Study: Cross-talk between prostate cancer and tumor-associated bone microenvironment
Years: 2010 - 2014

Degree: Ph.D.
Institution and Location: Vanderbilt University School of Medicine, Nashville, TN
Mentor: Robert J. Matusik, PhD
Field of Study: Cancer Biology
Dissertation Title: Mouse models of prostate cancer progression and bone metastasis
Years: 2002 - 2010

Degree: M.Sc.
Institution and Location: Barkatullah University, Bhopal, India
Field of Study: Biotechnology
Years: 1999 - 2001

Degree: B.Sc.
Institution and Location: Andhra University, Visakhapatnam, India
Field of Study: Biochemistry, Botany, Biotechnology
Years: 1996 - 1999

POSITIONS AND EMPLOYMENT

2020-Present: Tenure Track Assistant Professor (Joint Appointment), Dept. of Urology, TTUHSC
2018-Present: Tenure Track Assistant Professor, Dept. of Cell Biology and Biochemistry, TTUHSC
2018-Present: Member, Cancer Center, TTUHSC
2018-Present: Member, Graduate School of Biomedical Sciences - Biotechnology Program, TTUHSC
2018-Present: Member, Graduate School of Biomedical Sciences - Biochemistry, Cellular and

Molecular Biology (BCMB), TTUHSC
2014-2018: Project Scientist-Instructor, Cedars-Sinai Medical Center, Los Angeles, CA
2010-2014: Postdoctoral Scientist, Cedars-Sinai Medical Center, Los Angeles, CA
2002-2010: Graduate Student, Vanderbilt University School of Medicine, Nashville, TN
2001-2002: Biology Instructor, T.S.R and T.B.K. College, Andhra University, India
2000-2001: Research Trainee, National Institute of Immunology, New Delhi, India

AWARDS AND HONORS

- DoD Established Investigator Award highlighted in TTUHSC Daily Dose and EurekAlert!, June, 2025
  Description: (https://dailydose.ttuhsc.edu/2025/june/tttuhsc-researchers-prostate-cancer.aspx); (https://www.eurekalert.org/news-releases/1086982)

- Research Study highlighted in TTUHSC Daily Dose and EurekAlert!, March, 2025
  Description: (https://dailydose.ttuhsc.edu/2025/march/prostate-cancer-therapy-study.aspx); (https://www.eurekalert.org/news-releases/1078375)

- Cover Photo in *Cancers*, 2019

- Department of Defense Post-doctoral Fellowship Award, 2012
  Description: This Department of Defense (DoD) award supported my post-doctoral research on the role of TBX2 in prostate cancer bone metastasis in Dr. Leland Chung's lab.

- Travel Award to attend the Edward A. Smuckler Memorial Pathobiology of Cancer Workshop, American Association for Cancer Research, 2007
  Description: This travel award enabled me to attend the Pathobiology Workshop as a graduate student, which significantly supported my Ph.D. dissertation project focused on mouse pathology.

- Department of Defense Pre-doctoral Fellowship Award, 2006
  Description: This Department of Defense (DoD) award was instrumental in advancing my early research in Dr. Matusik's lab on the role of TBX2 in prostate cancer.

- Travel Award to attend SBUR annual meeting, Society for Basic Urologic Research (SBUR), 2006

- Fellowship, Interdisciplinary Graduate Program in Biomedical Sciences, Vanderbilt University, Nashville, TN, USA, 2002
  Description: This Fellowship supported my initial Ph.D. research in Dr. Robert Matusik's lab at Vanderbilt University, as part of the Interdisciplinary Graduate Program (IGP) in Biomedical Sciences.

- Master's Dissertation Research Scholarship, Barkatullah University, Bhopal, M.P., India., 2000
  Description: This six-month research scholarship provided my first opportunity to conduct research at a national laboratory in India - the National Institute of Immunology, New Delhi

FUNDED PEER-REVIEWED RESEARCH GRANTS

Research Support (Current):

PC240450 Nandana (PI) 07/01/2025-06/30/2028
Idea Development Award (Established Investigator)
Funding Agency: DoD-PCRP
Title: Role of TBX2 in the establishment of the Prostate Cancer Premetastatic Niche (PMN) in the Bone
Percent effort: 30%
Amount: $1,199,999 (Direct Costs)
Goal: Elucidate the role of exosomal NICD3 in bone metastatic progression from castration-resistant prostate cancer (CRPC) - the advanced stage of the disease.
Role: Principal Investigator

RP210154 Nandana (PI) 09/1/2023-08/31/2026
Funding Agency: CPRIT-TREC
Title: TBX2 acts as the molecular switch to downregulate androgen receptor and upregulate glucocorticoid receptor signaling in castrate resistant prostate cancer
Percent effort: 5%
Amount: $300,000 (Direct Costs)
Goal: Elucidate the role of TBX2 as a driver of the AR- to GR- signaling switch in castrate resistant prostate cancer (CRPC) - the advanced stage of the disease.
Role: Principal Investigator

Foundation Grant Nandana (PI) 12/1/2024-11/30/2025
Funding Agency: The Ted Nash Long Life Foundation (3rd year extension)
Title: A novel signaling pathway in prostate cancer bone metastasis
Percent effort: 10%
Amount: $100,000 (Direct Costs)
Goal: Elucidate the role of CB103, an NICD inhibitor, on bone metastatic progression from prostate adenocarcinoma (PCa) - the hormone-responsive and initial stage of the disease.
Role: Principal Investigator

Research Support (Completed):

Foundation Grant Nandana (PI) 01/01/2024- 12/31/2024
Funding agency: The CH Foundation
Title: Role of TBX2/SOX2 Signaling in prostate cancer bone metastasis
Percent effort: 0%
Amount: $50,000 (Direct Costs)
Goal: To investigate the paracrine/endocrine mechanisms through which TBX2/SOX2 signaling drives prostate adenocarcinoma/CRPC bone metastasis.
Role: Principal Investigator

Foundation Grant Nandana (PI) 12/1/2022-11/30/2024
Funding Agency: The Ted Nash Longlife Foundation
Title: A novel signaling pathway in prostate cancer bone metastasis

Percent effort: 10%
Amount: $200,000 (Direct Costs)
Goal: Elucidate the role of TBX2/NOTCH signaling pathway in the bone metastatic progression from prostate adenocarcinoma - the hormone-responsive and initial stage of the disease.
Role: Principal Investigator

X81XWH-16-1-0174 Nandana (PI) 09/30/16-09/29/22 (NCE)
Idea Development Award (New Investigator)
Funding agency: DoD-PCRP
Title: A novel Immune-Intact Mouse Model of Prostate Cancer Bone Metastasis: Mechanisms of Chemotaxis and Bone Colonization.
Percent effort: 40%
Amount: $205,625 (Direct Costs)
Goal: To determine RANKL/RANK and CXCL12/CXCR4 signaling convergence in prostate cancer bone metastasis in the context of immune-intact mice.
Role: Principal Investigator

X81XWH-12-1-0042 Nandana (PI) 09/30/12-09/30/14
Postdoctoral Fellowship Award
Funding agency: DoD-PCRP
Title: The role of TBX2 in mediating the RANKL pathway in prostate tumor progression and bone metastasis.
Percent effort: 100% (Salary only)
Amount: $124,200 (Direct Costs)
Goal: To study the mechanisms by which TBX2 plays a role in PCa bone metastasis and bone remodeling.
Role: Principal Investigator

W81XWH-07-1-0155 Nandana (PI) 11/30/06-11/30/09
Predoctoral Fellowship Award
Funding agency: DoD-PCRP
Title: Investigating the role of TBX2 in the inhibition of senescence in prostate cancer
Percent effort: 100% (Salary only)
Amount: $97,149 (Direct Costs)
Goal: To study the role of TBX2 in androgen regulation and prostate cancer progression
Role: Principal Investigator

Grants submitted but not funded:

*NIDDK (R01), March 2024, Nandana S (Co-Investigator), Role of TIAM1-SLIT3 signaling in BPH, 10% effort, $1,600,000 (Direct Cost).

*Foundation Grant (The Welch Foundation) The Welch Foundation, January 2024, Nandana S (Collaborator), Targeting TIAM1-RAC1 biochemical signaling axis in benign prostatic hyperplasia.

*NIH-R01, October 2023, Nandana S (Principal Investigator), A TBX2-driven switch from AR- to GR-signaling drives acquired resistance in prostate cancer.

*DoD-PCRP Idea Development Award (Established Investigator), July 2023, Nandana S (Principal Investigator), A TBX2-driven switch from AR- to GR- signaling drives acquired resistance in prostate cancer.

*ACS (American Cancer Society) RSG, March 2022, Nandana S, (Principal Investigator), Role of TBX2 Signaling in the Progression to Advanced Prostate Cancer.

*NIH-R01, February 2022, Nandana S (Principal Investigator), Cell-intrinsic and exosome-mediated roles of TBX2 signaling in prostate cancer progression and metastasis.

*NIH-R01, February 2021, Nandana S, (Principal Investigator), Role of TBX2 Signaling in the Progression to Advanced Prostate Cancer.

*CPRIT High Impact High Risk, January 2021, Nandana S, (Principal Investigator), Dissecting the cross-talk between B cells and CXCL12/CXCR4 chemokine pathway in the manifestation of Prostate Cancer Metastasis.

*NIH-R01, February 2020, Nandana S, (Principal Investigator), Dissecting the cross-talk between B cells and CXCL12/CXCR4 chemokine pathway in prostate cancer progression and bone metastasis.

*CPRIT High Impact High Risk, January 2020, Nandana S, (Principal Investigator), Dissecting the cross-talk between B cells and CXCL12/CXCR4 chemokine pathway in the manifestation of Prostate Cancer Metastasis.

*DoD-PCRP Idea Expansion Award, September 2019, Nandana S, (Principal Investigator), Dissecting the cross-talk between B cells and CXCL12/CXCR4 chemokine pathway in the manifestation of Prostate Cancer Bone Metastasis.

PUBLICATIONS

*Khedmatgozar H, Dutta S, Dominguez M, Latour D, Jhonson MK, Fokar M, Warraich I, de Riese W, Haynes, Jr A, Brandi L, Matusik RJ, **Nandana S**, Tripathi M (2025). TIAM1 signaling drives prostatic budding and branching phenotypes and is a potential therapeutic target for BPH. *JCI Insight* 10(12): 1-19.

*Dutta S, HK, Patel GK, Latour D, Welsh J, Mustafi M, Mitrofanova A, Tripathi M, **Nandana S** (2025). A TBX2-driven signaling switch from androgen receptor to glucocorticoid receptor confers therapeutic resistance in prostate cancer. *Oncogene* 44: 877-892.

*Patel G, Dutta S, Mahmud Syed M, Ramachandran S, Sharma M, Rajamanickam V, Ganapathy V, DeGraff D, Pruitt K, Tripathi M, **Nandana S** (2021). TBX2 Drives Neuroendocrine Prostate Cancer through Exosome-Mediated Repression of miR-200c-3p. *Cancers* 13: 1-18. PubMed ID # 34638504.

*Tharp D, **Nandana S** (2019). How Prostate Cancer Cells Use Strategy Instead of Brute Force to Achieve Metastasis. *Cancers* 11(12).

*Chu GC, Chung, LWK, Gururajan M, Hsieh C, Josson S, **Nandana S**, Sung S, Wang R, Wu JB, Zhau HE (2019). Regulatory signaling network in the tumor microenvironment of prostate cancer bone and visceral organ metastases and the development of novel therapeutics. *Asian Journal of Urology* 6(1): 65-81.

*Tripathi M, **Nandana S**, Billet S, Cavassani KA, Mishra R, Chung LWK, Posadas EM, Bhowmick NA (2017). Modulation of cabozantinib efficacy by the prostate tumor microenvironment. *Oncotarget* 8(50): 87891-87902.
***Nandana S**, Tripathi M, Duan P, Chu C, Mishra R, Liu C, Jin R, Yamashita H, Zayzafoon M, Bhowmick NA, Zhau HE, Matusik RJ, Chung LWK (2017). Bone Metastasis of Prostate Cancer Can Be Therapeutically Targeted at the TBX2-WNT Signaling Axis. *Cancer Research* 77(6): 1331-1344.

*Gururajan M, Cavassani KA, Sievert M, Duan P, Lichterman J, Huang J, Smith B, You S, **Nandana S**, Chu GC, Mink S, Josson S, Liu C, Morello M, Jones, Lawrence WM., Kim J, Freeman MR, Bhowmick N, Zhau HE, Chung LWK, Posadas EM (2015). SRC family kinase FYN promotes the neuroendocrine phenotype and visceral metastasis in advanced prostate cancer. *Oncotarget* 6(42): 44072-44083.

*Josson S, Gururajan M, Hu P, Shao C, Chu GY, Zhau HE, Liu C, Lao K, Lu CL, Lu YT, Lichterman J, **Nandana S**, Li Q, Rogatko A, Berel D, Posadas EM, Fazli L, Sareen D, Chung LWK (2014). miR-409-3p/5p promotes tumorigenesis, epithelial-to-mesenchymal transition, and bone metastasis of prostate cancer. *Clinical Cancer Research* 20(17): 4636-46.

***Nandana S**, Chung LWK (2014). Prostate cancer progression and metastasis: Current and potential therapeutic pathways & mouse models in pre-clinical research. *American Journal of Clinical and Experimental Urology* 2(2): 92-101.

***Nandana S**, Ellwood-Yen K, Sawyers CL, Wills ML, Weidow B, Case TC, Vasioukhin V, Matusik RJ (2010). Hepsin co-operates with myc in the progression of adenocarcinoma in a prostate cancer mouse model. *Prostate* 70(6): 591-600.

Degraff DJ, Yu X, Sun Q, Mirosevich J, Jin RJ, Wang Y, Gupta A, **Nandana S**, Case T, Paul M, Huang HY, Shapiro E, Logan S, Suzuki K, Orgebin-Crist MC, Matusik RJ The role of Foxa proteins in the regulation of androgen receptor activity. (2009). Springer, pp. 587-615.

*Yi Y, **Nandana S**, Casae TC, Nelson C, Radmilovic T, Matusik RJ, Tsuchiya KD (2009). Candidate metastasis suppressor genes uncovered by array comparative genomic hybridization in a mouse allograft model of Prostate Cancer. *Molecular Cytogenetics* 2(18).

*Tripathi M, **Nandana S**, Yamashita H, Kirchhofer D, Quaranta V (2008). Laminin-332 is a substrate for hepsin, a protease associated with prostate cancer progression. *Journal of Biological Chemistry* 283(45): 30576-84.

*Matusik RJ, Jin RJ, Sun Q, Wang Y, Yu X, Gupta A, **Nandana S**, Case TC, Paul M, Mirosevich J, Oottamasathien S, Thomas J (2008). Prostate epithelial cell fate. *Differentiation* 76(6): 682-98.

*Levititin F, Weiss M, Hahn Y, Stern O, Papke RL, Matusik RJ, **Nandana S**, Ziv R, Pichinuk E, Salame S, Bera T, Vincent J, Lee B, Pastan I, Wreschner DH (2008). PATE Gene Clusters Code for Multiple, Secreted TFP/Ly-6/uPAR Proteins that are expressed in reproductive and neuron-rich tissues and possess neuromodulatory activity. *Journal of Biological Chemistry* 283(24): 16928-16939.

*Kenchappa P, Yadav A, Singh G, **Nandana S**, Banerjee K (2004). Rescue of TNF alpha inhibited neuronal cells by IGF-1 involves Akt and c-Jun N-terminal kinases. *Journal of Neuroscience Research* 76(4): 466-474.

INVITED TALKS AND PRESENTATIONS

Invited:

*__Nandana S__., Dutta S, Patel GK, Khedmatgozar H, Latour D, Welsh J, Mustafi M, Mitrofanova A, Tripathi M. **(Podium Presentation)**, Unboxing T-Box2: Its crucial role in prostate cancer progression and metastasis, Univ of Puerto Rico, PR, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR, March 2025.

*Dutta S., Khedmatgozar H, Patel GK, Latour D, Welsh J, Mustafi M, Mitrofanova A, Tripathi M, **Nandana S. (Podium Presentation)**, TBX2-driven signaling switch from androgen receptor to glucocorticoid receptor confers therapeutic resistance in prostate cancer, American Association of Cancer Research (AACR) Annual Meeting, AACR, San Diego, CA, April 2024.
(Published in Cancer Research (2024), 84 (6_Supplement): 6603)

*Dutta S., Khedmatgozar H, Patel GK, Latour D, Welsh J, Mustafi M, Mitrofanova A, Tripathi M., **Nandana S. (Podium Presentation)**, TBX2-driven signaling switch from androgen receptor to glucocorticoid receptor confers therapeutic resistance in prostate cancer, Society for Basic Urologic Research (SBUR) Annual Meeting, SBUR, San Antonio, TX, November 2023.
(Travel Award Winner)

*__Nandana S__., Dutta S, Patel GK, Latour D, Welsh J, Tripathi M. **(Podium Presentation - Virtual)**, TBX2-driven signaling switch from androgen receptor to glucocorticoid receptor confers therapeutic resistance in prostate cancer, Penn State Milton S. Hershey Medical Center and College of Medicine, Visiting Professorship, Dept. of Pathology and Laboratory Medicine, Hershey, PA, May 2023.

*Dutta S., Khedmatgozar H, Patel GK, Latour D, Welsh J, Mustafi M, Mitrofanova A, Tripathi M., **Nandana S. (Podium Presentation - Virtual)**, TBX2 acts as a switch to down regulate androgen receptor and up regulate glucocorticoid receptor in castrate-resistant prostate cancer, Texas Center for Comparative Cancer Research (TC3R), TC3R, Amarillo, TX, February 2023.

*__Nandana S__., Patel GK, Dutta S, Tripathi M. **(Podium Presentation – Virtual)**, TBX2 signaling in the crine-o-logy of prostate cancer progression and metastasis, Society for Basic Urologic Research (SBUR) Annual Meeting, SBUR, November 2022.

*__Nandana S__., Patel G.K., Dutta S., Tripathi M. **(Podium Presentation)**, TBX2 signaling in the crine-o-logy of prostate cancer progression and metastasis, Dept of Urology, TTUHSC, Lubbock, TX, October 2022.

*Dutta S., Patel GK, Tripathi M, **Nandana S. (Podium Presentation)**, TBX2/miR-373-3p/RBPJ drives prostate cancer bone remodeling in an exosome-mediated manner, Student Research Week, TTUHSC, Lubbock, TX, February 2022.

*Dutta S., Patel GK, Tripathi M, **Nandana S. (Podium Presentation – Virtual)**, TBX2 drives neuroendocrine prostate cancer through exosome-mediated repression of miR-200c-3p, Abilene Research Symposium, TTUHSC, Abilene, Abilene, TX, October 2021.

*__Nandana S__., Patel G.K., Dutta S., Tripathi M. **(Podium Presentation – Virtual)**, Prostate Cancer Progression: Novel Signaling Mechanisms and Mouse Models, Mizoram University, India, Mizoram University, Aizawl, Mizoram University, Aizawl, September 2021.

*__Nandana S__., Patel GK, Dutta S, Tripathi M. **(Podium Presentation)**, TBX2 drives exosome-mediated prostate cancer progression to castrate resistant prostate cancer, Cancer Center Research Meeting, TTUHSC, Lubbock, TX, August 2021.

*__Nandana S__., Patel GK, Dutta S, Tripathi M. **(Podium Presentation)**, TBX2 drives exosome-mediated prostate cancer progression to castrate resistant prostate cancer, Cancer Center Research Meeting, TTUHSC, Lubbock, TX, August 2021.

*__Nandana S__. **(Podium Presentation)**, TBX2 drives exosome-mediated prostate cancer progression to castrate resistant prostate cancer, Cancer Biology Research Focus Group Seminar Series, TTUHSC, Lubbock, TX, December 2020.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, TSR and TBK College, Andhra University, Visakhapatnam, India, December 2019.

*__Nandana S__., Gururajan M, Shiao S, Chung LWK. **(Podium Presentation)**, A novel syngeneic mouse model of prostate cancer bone metastasis: mechanisms of chemotaxis and bone colonization, AACR Annual Meeting, American Associate of Cancer Research, Atlanta, GA, April 2019.
(Published in Cancer Res (2019) 79 (13_Supplement): 4523)

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, Cancer Biology Research Focus Group Seminar Series, TTUHSC, Lubbock, TX, March 2019.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, Garrison Institute of Aging Seminar Series, TTUHSC, Garrison Institute of Aging, Lubbock, TX, January 2019.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, University of North Carolina, Department of Biological Sciences, Charlotte, NC, February 2018.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, TTUHSC, Department of Cell Biology and Biochemistry, Lubbock, TX, February 2018.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, University of Nebraska Medical Center, Department of Biochemistry & Molecular Biology, Omaha, NE, January 2018.

*__Nandana S__. **(Podium Presentation)**, Prostate Cancer Bone Metastasis: Novel signaling mechanisms and mouse models, University of Nebraska Medical Center, College of Dentistry, Lincoln, NE, October 2017.

*__Nandana S__. **(Podium Presentation)**, Modeling prostate cancer metastasis using xenograft and syngeneic mouse models, Program Project (P01) Grant Meeting, Cedars-Sinai Medical center, Los Angeles, CA, September 2017.

*__Nandana S__. **(Podium Presentation – Virtual)**, TBX2-WNT signaling axis – a new therapeutic target for prostate cancer bone metastasis, Prostate Cancer Foundation Webinar, Prostate Cancer Foundation, March 2017.

*__Nandana S__. **(Podium Presentation)**, TBX2-WNT signaling axis – a new therapeutic target for prostate cancer bone metastasis, Cancer Metabolism Focus Group, Cedars-Sinai Medical Center, Los Angeles, CA, February 2017.

*__Nandana S__. **(Podium Presentation)**, TBX2 promotes prostate cancer bone metastasis and growth in the bone microenvironment through WNT signaling, Gathering for Postdoctoral Scientists (GPS), Cedars-Sinai Medical Center, Los Angeles, CA, July 2014.

*__Nandana S__. **(Podium Presentation)**, TBX2 promotes prostate cancer bone metastasis and growth in the bone microenvironment through WNT signaling, Program Project Grant (P01) Meeting, Cedars-Sinai Medical Center, Los Angeles, CA, May 2014.

*__Nandana S__. **(Podium Presentation)**, Mouse models of prostate cancer progression and bone metastasis, Fred Hutchinson Cancer Research Center, Seattle, WA, November 2009.

*__Nandana S__. **(Podium Presentation)**, Mouse models of prostate cancer progression and bone metastasis, Cedars-Sinai Medical Center, Los Angeles, CA, October 2009.

*__Nandana S__. **(Podium Presentation)**, Mouse models of prostate cancer progression and bone metastasis, Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA, August 2009.

Accepted:

*Do V, Dutta S, Tripathi M, **Nandana S**. Poster, The role of TBX2 in driving therapeutic resistance in advanced prostate cancer, Undergraduate Research Conference, TTU, Lubbock, TX, April 2025.

*Dominguez M, Khedmatgozar H, Dutta S, Patel GK, Mahmud Syed M, Woh A, Nandana R, Brandi L, Matusik RJ, **Nandana S**, Tripathi M. Poster, EGR1 drives prostatic hyperplasia via promoting cell proliferation and epithelial budding and branching, Student Research week, TTUHSC, Lubbock, TX, February 2025.

*Raju MK, Motakatla P, Dutta S, Tripathi M, **Nandana S**. Poster, Role of TBX2 in the establishment of the prostate cancer premetastatic niche in the bone, Student Research Week, TTUHSC, Lubbock, TX, February 2025.

*Khedmatgozar H., Dutta S, Dominguez M, Raju M, Latour D, Jhonson MK, Fokar M, Warraich I, Haynes Jr A, Maurer B, de Riese W, Brandi L, Matusik RJ, **Nandana S**, Tripathi M. Poster, TIAM1 is a driver of the prostatic branching phenotype and a potential therapeutic target for Benign Prostatic Hyperplasia, Student Research Week, TTUHSC, Lubbock, TX, February 2025.

*Dutta S, Khedmatgozar H, Patel GK, Tripathi M, **Nandana S**. Poster, A TBX2-driven switch from androgen receptor to glucocorticoid receptor confers therapeutic resistance in prostate cancer, 1st international Conference on Steroid Hormones and Receptors, Endocrine Society, Albuquerque, NM, October 2024.
(Published in Endocrinology, Vol 166, Issue Supplement_1, Apr 2025)

*Dutta S, Patel GK, Khedmatgozar H, Latour D, Tripathi M, **Nandana S**. Poster, TBX2 acts as a molecular switch to down regulate the androgen receptor and up regulate the glucocorticoid receptor signaling in castrate resistant prostate cancer, Student Research Week, TTUHSC, Lubbock, TX, February 2024.

*Dutta S, Patel GK, Khedmatgozar H, Latour D, Tripathi M, **Nandana S**. Poster, TBX2 acts as a molecular switch to down regulate the androgen receptor and up regulate the glucocorticoid receptor in castrate resistant prostate cancer, American Association of Cancer Research Annual Meeting, AACR, Orlando, FL, April 2023.
(Published in Cancer Research 83 (11_Supplement): A011-A011)

*Patel G, Dutta S, Khedmatgozar H, Tripathi M, **Nandana S**. Poster, TBX2 promotes Prostate Cancer bone-metastatic phenotype in Prostate through exosomal microRNA-375-3p, AACR Special Conference: Advances in Prostate Cancer Research, AACR, Denver, CO, March 2023.

*Do M, Do V, Dutta S, Tripathi M, **Nandana S**. Poster, The role of TBX2 in Prostate cancer Progression, Undergraduate Research Conference, TTU, Lubbock, TX, March 2023.

*Dutta S, Patel GK, Khedmatgozar H, Latour D, Tripathi M, **Nandana S**. Poster, TBX2 acts as a molecular switch to down regulate the androgen receptor and up regulate the glucocorticoid receptor in castrate resistant prostate cancer, AACR Special Conference on Metastasis, AACR, Portland, Oregon, November 2022.

*Dutta S, Patel GK, Khedmatgozar H, Latour D, Tripathi M, **Nandana S**. Virtual Poster, TBX2 acts as a mediator of potential switch from androgen receptor to glucocorticoid receptor signaling, Society for Basic Urologic Research (SBUR) Annual Meeting, SBUR, November 2022.

*Patel GK, Dutta S, Khedmatgozar H, Tripathi M, **Nandana S**. Virtual Poster, TBX2 promotes prostate cancer bone metastatic phenotype through exosomal microRNA-375-3p, American Association of Cancer Research, AACR, April 2022.
(Published in Cancer Research (2022) 82 (12_Supplement): 5999)

***Nandana S**. **(Podium Presentation)**, TBX2 signaling in the crine-o-logy of prostate cancer progression and metastasis, Mid-Cycle Review Talk, Dept. of Cell Biology and Biochemistry, TTUHSC, Lubbock, April 2022.

*Khedmatgozar H, Dutta S, Patel G, Brandi L, Welsh J, de Riese WT, Hayward S, Franco O, Matusik R, **Nandana S**., Tripathi M. Poster, Identification of signature genes, pathways and potential therapeutic agents for Benign Prostate Hyperplasia, using an integrated bioinformatic analysis, Student Research Week, Texas Tech University Health Sciences Center - GSBS, Lubbock, Texas, March 2022.

*Patel G, Dutta S, Khedmatgozar H, Tripathi M, **Nandana S**. Poster, TBX2 promotes Prostate Cancer bone-metastatic phenotype in Prostate through exosomal microRNA-375-3p, Student Research Week, TTUHSC, Lubbock, Texas, March 2022.

*Mahmud Syed M, Patel GK, Dutta S, Brandi L, Zhang F, Welsh J, Khedmatgozar H, de Riese WT, Hayward S, Franco O, Matusik R, Jin R, **Nandana S**, Tripathi M. Virtual Poster, Stromal-Epithelial Crosstalk in Benign Prostatic Hyperplasia, Society for Basic Urologic Research (SBUR), Society for Basic Urologic Research (SBUR), Virtual Meeting, November 2021.

*Patel GK, Dutta S, Mahmud Syed M, Ramachandran S, Sharma M, Rajamanickam V, Ganapathy V, DeGraff D, Pruitt K, Tripathi M, **Nandana S**. Virtual Poster, TBX2 Drives Neuroendocrine Prostate Cancer through Exosome-Mediated Repression of miR-200c-3p, Society for Basic Urologic Research (SBUR), Society for Basic Urologic Research (SBUR), Virtual Meeting, November 2021.

Patel GK, Dutta S, Mahmud Syed M, Ramachandran S, Sharma M, Rajamanickam V, Ganapathy V, DeGraff D, Pruitt K, Tripathi M, **Nandana S**. Virtual Poster, TBX2 Drives Neuroendocrine Prostate Cancer through Exosome-Mediated Repression of miR-200c-3p, Abilene Interdisciplinary Symposium on Cancer and Biomedical Research, Abilene Interdisciplinary Symposium on Cancer and Biomedical Research, Virtual Meeting, October 2021.

*Mahmud Syed M, Patel GK, Dutta S, Welsh J, Warraich IA, Hayward S, Franco O, Matusik R, **Nandana S**., Tripathi M. Poster, Role of EGR1 in the development and progression of Benign Prostatic Hyperplasia, Student research week, Texas Tech University Health Sciences Center - GSBS, Lubbock, Texas, March 2021.

*Do V, Patel GK, **Nandana S**., Tripathi M. Poster, Prostate cancer cells promote exosome-mediated fibroblast differentiation, Undergraduate Research Conference, Texas Tech University, Lubbock, Texas, March 2021.

*Do V, Patel GK, Tripathi M, **Nandana S**. Poster, TBX2 expression in cancer cells drives exosome-mediated fibroblast differentiation, Undergraduate Research Conference, TTU, Lubbock, TX, March 2020.

***Nandana S**., Gururajan M, Shiao S, Chu C, Chung LWK. Poster, Dissecting the role of B cells in prostate cancer bone metastasis, Society for Basic Urologic Research (SBUR) Annual Meeting, SBUR, New Orleans, LA, November 2019.

*Chugh N., Patel G.K., **Nandana S**., Tripathi M., **(Podium Presentation)**, Characterization of Molecular Markers involved in Neuroendocrine Differentiation of Prostate Cancer, Summer Accelerated Biomedical Research (SABR) Student Presentations, TTUHSC, Lubbock, TX, August 2019.

*Tharp D., Patel G.K., **Nandana S**., **(Podium Presentation)**, TBX2 promotes prostate cancer progression through exosomes, Summer Accelerated Biomedical Research (SABR) Student Presentations, TTUHSC, Lubbock, TX, August 2019.

*Tripathi M, **Nandana S**., Huang J, Kato M, Chung LWK, Xin L, Bhowmick NA. Poster, Reciprocal prostate cancer signaling with its microenvironment mediates castrate resistant disease progression, AACR Special Conference - The function of Tumor Microenvironment in Cancer Progression, AACR, San Diego, CA, January 2016.

***Nandana S**., Tripathi M, Duan P, Chu C, Mishra R, Liu C, Jin R, Yamashita H, Zayzafoon M, Bhowmick NA, Zhau HE, Matusik RJ, Chung LWK. Poster, TBX2-WNT signaling axis – a new therapeutic target for prostate cancer bone metastasis, The Stem Cell Niche and Cancer Microenvironment Symposium, Cedars-Sinai Medical Center, Los Angeles, CA, November 2015.

***Nandana S**., Tripathi M, Chu C, Bhowmick NA, Matusik RJ, Chung LWK. Poster, Blocking endogenous TBX2 expression in PC3 prostate cancer cells abrogates bone metastasis in a xenograft mouse model, AACR Special Conference on Tumor Invasion and Metastasis, AACR, San Diego, CA, January 2013.

***Nandana S**., Tripathi M, Chu C, Matusik RJ, Chung LWK. Poster, Blocking TBX2 abrogates bone metastasis in a xenograft mouse model of prostate cancer, Fourth Annual Cancer Institute Research Poster Presentation, Cedars-Sinai Medical Center, Los Angeles, CA, June 2012.

***Nandana S**., Jin R, Yamashita H, Shao C, Matusik RJ, Chung LWK. Poster, TBX2, a senescence-related transcription factor mediates its action through BMP2 and RANKL contributing to prostate cancer

growth and bone metastasis, 11th International Conference on Cancer-Induced Bone Disease, Cancer and Bone Society, Chicago, IL, December 2011.

*__Nandana S__., Matusik RJ. Poster, Blocking endogenous TBX2 in PC3 human prostate cancer cells reduces in vivo invasion, metastasis and growth in bone microenvironment, Department of Defense (DoD) Prostate Cancer IMPACT Meeting, DoD, Orlando, FL, March 2011.

*Yamashita H, Tripathi M, **Nandana S**, Ganesan R, Kirchhofer D, Quaranta V. Poster, Laminin-332 is a substrate for hepsin, a protease associated with prostate cancer progression, Sixth International Symposium on Hormonal Oncogenesis, Sheraton Grande Tokyo Bay Hotel, Tokyo, Japan, February 2011.
(Published in Hormones and Cancer Volume 2, Issue 1, pp 3-37)

*Tripathi M, **Nandana S**., Yamashita H, Kirchhofer D, Quaratanta V. Poster, Cleavage of Laminin-332 by hepsin and its implications in the progression of prostate cancer, Vanderbilt-Ingram Cancer Center Retreat, Student Life Center, Vanderbilt University, Nashville, TN, May 2009.

*Yu X, **Nandana S**., Saliganan A, Case TC, Paul M, Kim H, Fridman R, Bonfil DR, Cher M, Matusik RJ. Poster, The Role of MT1-MMP and PDGF-D in Prostate Cancer Progression, AACR Special Conference, Advances in Prostate Cancer Research, AACR, San Diego, CA, January 2009.

*__Nandana S__. **(Podium Presentation)**, Hepsin co-operates with Myc in the progression of adenocarcinoma in a prostate cancer mouse model, Science Hour, Department of Cancer Biology, Vanderbilt University, Nashville, TN, January 2009.

*__Nandana S__., Matusik RJ. Poster, TBX2 mediates osteogenic burden of PC3 human prostate cancer cells in the bone microenvironment, SBUR Fall Annual Meeting, SBUR, Phoenix, AZ, November 2008.

*__Nandana S__., Chevillet J, Ellwood-Yen K, Sawyers CL, Wills ML, Case TC, Vasikoukhin V, Matusik RJ. Poster, Hepsin co-operates with myc in the progression of adenocarcinoma in a Prostate Cancer mouse model, Edward A. Smuckler Memorial Workshop in Pathology of Cancer, AACR, Snowmass, CO, August 2007.

*__Nandana S__., Chevillet J, Ellwood-Yen K, Sawyers CL, Wills ML, Case TC, Vasioukhin V, Matusik RJ. Poster, Investigation of the hepsin/myc mouse model in the progression of prostate cancer, SBUR Fall Annual Meeting, SBUR, Phoenix, AZ, November 2006.

*__Nandana S__., Matusik RJ. Poster, Investigation of the role of TBX2 in androgen regulation and prostate cancer progression, Department of Cancer Biology Annual Retreat, Vanderbilt University, Lake Barkley State Resort Park, Cadiz, Kentucky, November 2005.

CONFERENCE PROCEEDINGS

*Tripathi M, **Nandana S**, Huang J, Kato M, Mishra R, Chung LWK, Xin L, Bhowmick N (2019). Signaling crosstalk within prostate tumor microenvironment mediates castrate resistant disease progression. *Cancer Research* 79(13).

*__Nandana S__, Tripathi M, Duan P, Chu G, Zhau HE, Matusik RJ, Chung LWK. (2016). Blocking endogenous TBX2 abrogates prostate cancer bone metastasis through WNT signaling. *Cancer Research* 76.

*Tripathi M, **Nandana S**, Billet S, Posadas EM, Chung LWK, Bhowmick NA (2016). Microenvironment mediates the efficacy of Cabozantinib in prostate cancer. *Cancer Research*.

(The remaining published abstracts and conference proceedings are listed under the *Invited Talks and Presentations* section.)

TEACHING / TRAINING EXPERIENCE

Texas Tech University Health Sciences center (TTUHSC)

2024, 2023, 2022, 2021, GBTC 5020, Lecture, **Biotechnology Laboratory Methods**

- My class includes a short lecture followed by hands-on teaching of quantification of RNA, DNA, and qRT-PCR techniques.

2024, 2023, GSBS 5372, Lecture, **Core II: Cells**

- My class focuses on the role of extracellular vesicles in the communication between the primary tumor and the tumor microenvironment (TME) including the TME at the metastatic site. The other focus of my class is the extracellular matrix and its role in cancer.

2021, GBCM 6235, Lecture, **Pathophysiology of the Prostate**

- I co-directed the course with Dr. Manisha Tripathi, which featured lectures followed by in-depth discussions on Benign Prostatic Hyperplasia (BPH) and Prostate Cancer (PCa). The curriculum covered topics such as the pathophysiology of both diseases, androgen receptor signaling, molecular mechanisms of therapy resistance, stromal–epithelial cross-talk, and key signaling pathways involved in disease progression.

2022, GBCM 6235, Lecture, **Scientific Communication: Grant proposals and Manuscripts**

- I co-directed this course with Dr. Manisha Tripathi that introduced students to the principles of scientific writing and grant proposal preparation, with an emphasis on formats used by the Department of Defense (DoD) and the National Institutes of Health (NIH). The course aimed to familiarize students with the components of a grant application, strengthen their scientific writing skills, and prepare them for the qualifying exam.

2025, 2023, 2022, 2021, 2020, GBCM 6320, Lecture, **Advanced Cell Biology**

- My classes are focused on: 1) how to critique papers/read the literature, and 2) the molecular aspects of Cell Motility in general, and discusses in detail the fundamental facets of Cell Motility in the specific context of Cancer Metastasis.

2025, 2023, 2022, 2021, GBCM 6333, Lecture, **Advanced Protein Biochemistry**

- My classes are focused on the proteomic characterization of protein function and dysfunction in cancer, with a particular emphasis on post-translational modifications (PTMs). I am also actively

involved in evaluating student presentations based on a research topic of their choice - a required part of the course.

2023, 2022, 2020, 2019, GBTC 5340, Lecture, **The Biology of Cancer**

- My class is focused on the fundamental principles underlying the metastatic cascade, with specific examples of heterotypic interactions between the tumor cells and the tumor microenvironment (TME). The class then delves into a specific example, i.e. prostate cancer bone metastasis. The class ends with a discussion of the various pre-clinical mouse models that are used in cancer research.

Innovations in Education:

Texas Tech University Health Sciences Center, December 2019

Description: Inspired by the need to teach students in *The Biology of Cancer* course (GBTC 5340) the fundamental principles underlying tumor metastasis, I worked with Darron Tharp, a 2019 SABR student in my lab, to develop a review article that draws analogies between cancer metastasis and conventional military warfare strategies. This article proved immensely helpful in explaining the complex processes of metastasis to students in a way that is accessible and relatable to a general audience. This article was published in *Cancers* and was featured on the cover of that issue.

Basic science research supervision (undergraduates, graduate students and post docs):

My supervision responsibilities include holding daily, weekly, monthly meetings to discuss the research progress of Ph.D. graduate students, postdoctoral fellows, technicians, and undergraduate students. These meetings involve the development of research ideas, data analysis and interpretation, manuscript preparation, and the creation of podium and poster presentations for local, regional and national conferences. A detailed description of the individuals I have supervised, along with their research accomplishments, is provided in the *Mentoring and Advising* section.

Mentoring and Advising

1. **Graduate Students**

Research Advisor for PhD Graduate Students (Past):

- **Sayanika Dutta, PhD (BCMB, TTUHSC) (2020–2025) –** Dr. Dutta recently completed her Ph.D. in my lab, where her dissertation focused on the molecular drivers of therapy resistance in advanced prostate cancer. She served as the lead author of a 2024 *Oncogene* publication, which demonstrated that TBX2 promotes advanced prostate cancer by repressing the androgen receptor and activating the glucocorticoid receptor. Dr. Dutta's research has received significant recognition within the scientific community. She was invited to present her work at prestigious national conferences, including the 2024 AACR Annual Meeting and the 2023 SBUR Annual Meeting. She has also shared her findings at several local and regional events, such as TTUHSC's Student Research Week and the Texas Center for Comparative Cancer Research in Amarillo. These opportunities have not only underscored the impact of her research but also helped her refine her skills as a compelling communicator and speaker. Her accomplishments have been recognized with several honors, including the 2023 SBUR Travel Award, the 2022

Mary Lou Clemens Scholarship, and the 2022 Our Legacy Now Scholarship. In addition to her first-author publication, Dr. Dutta is a co-author on at least two other papers (*Cancers*, 2021; *JCI Insight*, 2025), with another manuscript currently in preparation.

Research Advisor for PhD Graduate Students (Current):

- **Hamed Khedmatgozar (BCMB, TTUHSC) (2022-Present)** - Hamed is a graduate student in Dr. Tripathi's lab, and I serve as a co-mentor on his Ph.D. dissertation committee. His research focuses on the molecular mechanisms that drive prostate overgrowth in benign prostatic hyperplasia (BPH), a condition prevalent among men over 50. He recently led a first-author study (*JCI Insight*, 2025) that identified TIAM1 as a key regulator of budding and branching morphogenesis in BPH. Hamed received a travel award to attend the 2023 Annual Meeting of the Society for Basic Urologic Research and was honored with the 2024 TTUHSC GSBS Dean's Scholar Award.

- **Dongming Jiang (BCMB, TTUHSC) (2025-Present)** - Dongming recently joined my lab as a Ph.D. graduate student. His research interests include uncovering the molecular mechanisms by which prostate cancer cells evade immune surveillance.

- **Zheyun Niu (BCMB, TTUHSC) (2025-Present)** - Zheyun is a graduate student in Dr. Tripathi's lab, where I serve as a co-mentor on her Ph.D. dissertation committee. Her research explores how molecular interactions between the primary prostate tumor stroma and the bone microenvironment drive the formation of a pre-metastatic niche.

Research Advisor for Biotechnology Master's Students (Past):

- **Mosharaf Mahmud-Syed (2020-2021)** - Mosharaf's research centered on the molecular mechanisms underlying benign prostatic hyperplasia. He also co-authored a publication from our lab (*Cancers*, 2021) investigating the role of TBX2 in neuroendocrine prostate cancer. Mosharaf is currently pursuing his Ph.D. in Dr. Yangzom Bhutia's lab at TTUHSC.

Graduate Student (PhD) Thesis Committee Member:

- **Iffat Jahan (BCMB, TTUHSC) (2023-Present)** Dissertation Committee Member, Cell Biology and Biochemistry: As a committee member, I regularly participate in evaluating Iffat's ongloing research progress. Additionally, I served as the Committee Chair for her Qualifying exam.
- **Naresh Sah (BCMB, TTUHSC) (2022-Present)** Dissertation Committee Member, Cell Biology and Biochemistry: I participate in regular committee meetings to evaluate Naresh's ongoing research progress. Additionally, I served as the Committee Chair for his Qualifying exam.
- **Tasmin Omy (BCMB, TTUHSC) (2022-Present)** Dissertation Committee Member, Cell Biology and Biochemistry: I take part in committee meetings to provide guidance on Tasmin's ongoing research progress.
- **Dalia Martinez-Marin, PhD (BCMB, TTUHSC) (2021-2024)** Dissertation Committee Member, Immunology and Molecular Microbiology: I participated in regular evaluations of Dalia's research progress as part of the dissertation committee. Dalia published a first-author article in *Nature Communications.*

Graduate Student (MS Biotechnology) Thesis Committee Member:

- **Tasmin Omy (2020-2021)**
- **Christian Rivera (2020-2021)**

2. **Postdoctoral Fellows and Research Associates:**

Postdoctoral Fellows (Past):

- **Girijesh Kumar Patel, PhD (2019-2021)** - Dr. Patel's research focused on the molecular mechanisms by which prostate cancer cells communicate with their surrounding microenvironment, particularly via extracellular vesicles such as exosomes, in a paracrine manner. During his time in my lab, he led a first-author study (*Cancers*, 2021) that identified a novel pathway in neuroendocrine prostate cancer—an aggressive and lethal subtype. This study demonstrated that TBX2 upregulates *SOX2* and *MYCN* expression through *miR-200c-3p*, revealing a key regulatory axis in disease progression. Dr. Patel also contributed as a co-author on at least two other research articles from our lab (*Oncogene*, 2024; *JCI Insight*, 2025). He is currently a faculty member in the Department of Biotechnology at Motilal Nehru National Institute of Technology, Allahabad, India.

Postdoctoral Fellows (Current):

- **Murugananth Kumar Raju, PhD (2023-Present)** - Dr. Raju's research investigates how the primary prostate tumor establishes a pre-metastatic niche (PMN) in the bone via exosome-mediated paracrine signaling. This PMN facilitates the subsequent colonization and metastatic outgrowth of disseminated prostate cancer cells. His work forms the foundation of our ongoing DoD Idea Award (Established Investigator). Dr. Raju is also a co-author of a recent publication from our lab (*JCI Insight*, 2025).

Research Associates (Past):

- **Daniel Latour (2022-2023)** - Daniel's research contributed to understanding how TBX2 regulates the androgen and glucocorticoid receptors in prostate cancer progression. He is a co-author on a recent study from my lab (*Oncogene*, 2024). Daniel is currently pursuing his M.D. at UTHealth McGovern Medical School, Houston.

- **Hamed Khedmatgozar (2021–2022)** - During his time in my lab, Hamed focused on investigating the role of TBX2 in advanced prostate cancer. His contributions led to his co-authorship on a recent study from my lab, published in *Oncogene* (2024). He has since joined Dr. Tripathi's lab as a graduate student to pursue his Ph.D.

- **Jonathan Welsh, MD (2020-2021)** - Jonathan's work contributed to understanding the role of TBX2 in advanced prostate cancer. He is a co-author on a recently published study (*Oncogene*, 2024) investigating TBX2's role in therapy resistance in the disease. Dr. Welch is currently pursuing his residency program in Anesthesiology at Mass General Brigham, Boston.

Research Associates (Current):

- **Philip Motakatla (2024-Present)** - Philip is investigating the molecular mechanisms driving the formation of the pre-metastatic niche in the bone.

3. **Undergraduate Students, High School Students, and Other Individuals:**

Summer Accelerated Biomedical Research (SABR) Students:

- **Darron Tharp (2019) -** Darron was a SABR student in my lab who contributed to the preparation of a review article on cancer metastasis. The article was inspired by my lecture in *The Biology of Cancer* course, which explores the fundamental principles underlying metastatic progression. We drew conceptual parallels between metastasis and conventional warfare strategies, a unique

perspective that led to the article being selected as a cover feature in *Cancers* (2019). In addition, Darron earned 2nd place in the SABR project presentation competition.

- **Natasha Chugh (2019) - Natasha participated in the SABR program in Dr. Tripathi's lab, where I served as her co-mentor.**

Undergraduate Students:

- **Vinh Do (2024-Present)**
- **Minh Do (2021-2023)**
- **Vy Do (2020-2021)**

Vy, Minh and Vinh were undergraduate students at TTU who contributed to research on the role of TBX2 in prostate cancer progression. Over the years, they presented their work through posters at TTU's annual Undergraduate Research Conference.

Rotation Students:

- **Iffat Jahan (2022)**
- **Sayanika Dutta (2020)**
- **Mosharaf Mahmud-Syed (2019)**

Student Volunteers:

- **Vishal Bandaru (2020–2022) -** Vishal demonstrated a strong interest in cancer metastasis and contributed to lab research investigating the role of TBX2 in prostate cancer. He later pursued a Master of Science through the Graduate Medical Education Sciences (GMES) program at TTUHSC and is currently an MD candidate at the same institution.
- **Favour Malumi (2021-2022) -** Favour showed a keen interest in learning molecular biology techniques and actively participated in lab activities during her time in the lab.

Summary of Scholarly Activity:

Highlights of my Research Career:

1. **TBX2-Mediated Therapy Resistance in Advanced Prostate Cancer (Oncogene, 2025):** Expanding our work on TBX2, we investigated its role in resistance to enzalutamide, a key anti-androgen therapy in advanced prostate cancer. Using both human prostate cancer and castration-resistant prostate cancer (CRPC) models, we found that TBX2 represses androgen receptor (AR) expression while simultaneously activating glucocorticoid receptor (GR) expression—promoting a switch from AR to GR signaling that underlies therapeutic resistance. This dual regulation occurred through both transcriptional mechanisms and protein-protein interactions. We further demonstrated that SP2509, an allosteric inhibitor targeting LSD1 (a TBX2-binding partner in the CoREST complex), disrupts both TBX2-LSD1 and TBX2-GR interactions. These findings reveal a novel mechanism by which TBX2 drives enzalutamide resistance and highlight SP2509 as a promising therapeutic agent to overcome the AR-to-GR signaling switch in CRPC. This study was recently featured in *TTUHSC Daily Dose* and *EurekAlert!*.

2. **TIAM1 in Benign Prostatic Hyperplasia (JCI Insight, 2025):** In collaboration with the Tripathi lab, we explored the molecular basis of benign prostatic hyperplasia (BPH), a common age-related condition characterized by reactivation of developmental pathways such as prostatic budding and branching. Transcriptomic analyses of patient-derived BPH samples revealed significant upregulation of TIAM1, which we confirmed at the protein level. Using organoid models derived from human prostatic epithelial cells, we demonstrated that TIAM1 is essential for prostatic budding and branching morphogenesis. Genetic knockdown or pharmacologic inhibition of TIAM1 using the RAC1

inhibitor NSC23766 significantly curtailed organoid branching and growth, including in patient-derived models. These findings establish TIAM1 as a key driver of epithelial remodeling in BPH and suggest that targeting the TIAM1/RAC1 axis could provide a novel therapeutic strategy for managing this widespread condition.

3. **Mechanisms of Treatment-Induced Neuroendocrine Prostate Cancer (Cancers, 2021):** In this study, my lab focused on treatment-induced neuroendocrine prostate cancer (t-NEPC), a lethal and therapy-resistant subtype affecting 25–30% of patients with advanced disease. We identified TBX2 as a central regulator of a novel signaling cascade involving miR-200c-3p, SOX2, and N-MYC. TBX2 was found to repress miR-200c-3p transcriptionally, leading to elevated levels of SOX2 and N-MYC—key drivers of the neuroendocrine phenotype. Restoration of miR-200c-3p in TBX2DN cells reversed this effect, confirming its role as a critical intermediary. Notably, we also demonstrated that this axis operates via exosome-mediated intercellular communication, contributing to the spread of t-NEPC characteristics within the tumor microenvironment. These findings provide insight into both intracellular and intercellular mechanisms driving neuroendocrine differentiation and point to new avenues for therapeutic intervention.

4. **TBX2 as a Driver of Prostate Cancer Metastasis (Cancer Research, 2017):** Building on my interest in transcriptional regulators of cancer progression, I investigated the role of TBX2 in metastatic prostate cancer. Our work revealed that TBX2 is markedly overexpressed in both primary tumors and bone metastases in human specimens and xenograft models. Dominant-negative (DN)-based activity disruption of TBX2 in prostate cancer cell lines (PC3 and ARCaPM) led to significant reductions in proliferation, colony formation, and invasiveness in vitro. In vivo, activity disruption of TBX2 in human metastatic prostate cancer cell lines abrogated both soft tissue and bone metastases, and in intratibial models, impaired tumor growth and disrupted bone remodeling. Mechanistically, we showed that TBX2 drives metastasis by activating *WNT3A* transcription. Reintroducing *WNT3A* into TBX2DN cells partially restored their metastatic potential, while inhibition of *WNT3A* signaling suppressed TBX2-mediated invasion. These findings position TBX2 as a critical upstream regulator of the *WNT3A* axis and a potential therapeutic target for managing bone metastases in prostate cancer.

5. **Hepsin and Prostate Cancer Progression (The Prostate, 2011; JBC, 2008):** In my early research as a graduate student at Vanderbilt University, I explored the role of the serine protease hepsin in prostate cancer progression. Using a mouse model, I demonstrated that hepsin cooperates with the oncogene *myc* to drive the development and progression of high-grade invasive prostate adenocarcinoma (*The Prostate*, 2011). Elevated hepsin expression correlated with increasingly aggressive tumors over time, underscoring its role in tumor progression. In a complementary study (*JBC*, 2008), we uncovered a mechanistic basis for hepsin's pro-tumorigenic activity: it cleaves the extracellular matrix protein laminin-332 (Ln-332) at a conserved site, enhancing prostate cancer cell motility. This cleavage disrupts the tumor microenvironment and facilitates metastatic behavior, as evidenced by increased migration of cancer cells on hepsin-cleaved Ln-332. Together, these findings highlight hepsin as a key driver of both tumor aggressiveness and cellular motility, positioning it as a compelling therapeutic target in prostate cancer.

i10-Index:
i10-Index 15, Google Scholar, July 2, 2025
h index:
h index 13, Google Scholar, July 2, 2025

PROFESSIONAL SERVICE

2025-Present: Coordinator for Guest Speaker Seminar Series (CBB), Cell Biology and Biochemistry
2025: Grant Proposal Reviewer, Prostate Cancer Research, London, UK
2023, 2024: Faculty search committee member, Dept. of Cell Biology and Biochemistry, TTUHSC
2023, 2024: Instrument purchase committee member, Dept. of Cell Biology and Biochemistry, TTUHSC
2023-2025: Applicant interviewer for the Ph.D. Program in Biomedical Sciences, TTUHSC
2023: Committee for President's award for Interprofessional Collaborative Practice
2022: Society for Basic Urologic Research (SBUR), Member of Abstract Evaluation Committee
2019-2023: Poster Judge for the Annual Student Research Day
2019: Faculty search committee member for the Kayla Weitlauf Professorship, Dept. of Cell Biology and Biochemistry, TTUHSC
2019: Applicant Interviewer for the M.S. Biotechnology Program, TTUHSC

Editorial Board Member and Ad hoc Reviewer

Ad hoc Reviewer

- Signal Transduction and Targeted Therapy (2025-Present)
- Scientific Reports (2022-Present)
- Cancers (MDPI) (2020-Present)
- Oncogene (2019-Present)
- Biomolecules (MDPI) (2019-Present)
- Asian Journal of Urology (2018-Present)

Editorial Board Member

2019-Present: Journal of Pathology and Therapeutics

Faculty Development Activities

2024: Grant Writing Seminars Workshop, Texas Tech Office of Research & Innovation
2021: Faculty Development Course *Translational and Clinical Research,* TTUHSC-SOM
2020: Faculty Development Course *Medical Education,* TTUHSC-SOM
2019: Faculty Development Course *Academic Socialization,* TTUHSC-SOM

MEMBERSHIPS

2021-Present: American Society of Andrology
2018-Present: American Association of Indian Scientists in Cancer Research
2016-Present: American Association for Cancer Research
2006-Present: Society for Basic Urologic Research