BIOGRAPHICAL SKETCH

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NAME: Strand, Douglas W.

eRA COMMONS USER NAME: stranddw

POSITION TITLE: Assistant Professor of Urology

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Liberty University, Lynchburg, VA	B.S.	05/01	Biology
Baylor College of Medicine, Houston, TX	Ph.D.	06/07	Molecular/Cellular Biology
Vanderbilt University, Nashville, TN	Post-Doc	08/13	Urologic Surgery

A. Personal Statement

Using a combination of single cell RNA sequencing, immunohistochemistry, and flow cytometry, my lab characterized the cellular anatomy of the normal human prostate and developed the tools to identify and purify every cell type.

a. Henry G, Loof N, **Strand DW**. OMIP-40: Optimized gating of human prostate cellular subpopulations. Cytometry A. 2017 Aug 18. PMID:28834328
b. Henry GH, Malewska A, Mauck RJ, Gahan JC, Hutchinson R, Torrealba J, Francis F, Roehrborn CG, **Strand DW**. Molecular pathogenesis of human prostate basal cell hyperplasia. Prostate 2017; 77(13):1344-55. PMID: 28795417
c. **Strand DW**, Costa DN, Francis F, Ricke WA, Roehrborn CG. Targeting phenotypic heterogeneity in benign prostatic hyperplasia. Differentiation. 2017 Aug 4;96:49-61. PMID: 28800482
d. Henry GH, Malewska A, Joseph DB, Malladi VS, Lee J, Torrealba J, Mauck RJ, Gahan JC, Raj GV, Roehrborn CG, Hon GC, MacConmara MP, Reese JC, Hutchinson RC, Vezina CM, **Strand DW**. A cellular anatomy of the normal adult human prostate and prostatic urethra. Cell Reports. 2018 Dec 18;25(12):3530-42. PMID: 30566875

B. Positions and Honors

Positions and Employment

08/2001-04/2007 Graduate Student, Baylor College of Medicine Molecular and Cellular Biology, David Rowley
07/2007-07/2013 Postdoctoral Fellow, Vanderbilt University Urology, Simon Hayward
08/2013-07/2014 Research Assistant Professor, Vanderbilt University Urology
08/2014-present Assistant Professor, UT Southwestern Medical Center Urology

Other Experience and Professional Memberships

2006 Discovery Program mentor
2009- Member, Society for Basic Urologic Research
2011- NIH LRP ambassador
2011- Peer reviewer for multiple journals and granting agencies
2016- Ad hoc reviewer for NIH NIDDK
2016- Member, American Urological Association
2016- SBUR Abstract, Awards and Organizing committees
2016- AUA Abstract and Organizing committees

2017- AUA Early Career Investigator Workshop Mentor

Honors

1997-2001 4-year Honors program scholarship, Most Outstanding Honors Thesis
2006 Travel Award for SBUR meeting
2006 3rd place Poster Award BCM Graduate student symposium
2007 2nd place Poster Award BCM Graduate student symposium
2009-2011 DOD Postdoctoral training award (PC080160)
2010-2012 NIH LRP award
2010,2013 Vanderbilt Center for Translational Medicine StarBrite awards
2012 Travel Award, Podium presentation for SBUR meeting
2013 Travel Award for AUA meeting
2015 Best Reviewer Journal of Urology
2016 UTSW Center for Translational Medicine award
2018 Best Prostate Poster CAIRIBU meeting

C. Contribution to Science

1. My early contributions to science focused on the effects of TGFbeta on stromal-epithelial interactions in prostate. TGFbeta is a pro-fibrotic growth factor that has been shown to exert a context-specific effect on tumor progression in a variety of tissues including the prostate. In 3 first- or co-first author publications I was able to show using xenografting, cell culture, and transgenic approaches that TGFbeta drives stromal FGF-2 expression, which accelerates tumorigenesis through paracrine interactions. I served as the primary or co-investigator in these studies.

    a. Yang F*, **Strand DW*,** Rowley DR. Fibroblast Growth Factor 2 mediates Transforming Growth Factor beta Action in Prostate Cancer Reactive Stroma. Oncogene. 2008 Jan 17;27(4):450-9. (*denotes equal authorship) PMID: 17637743
    b. Barron DA*, **Strand DW***, Ressler SJ, Dang TD, Ayala GE, Ittmann M, Rowley DR. TGFβ1 Induces an Age-Dependent Inflammation of Nerve Ganglia and Fibroplasia in the Prostate Gland Stroma of a Novel Transgenic Mouse. PLoS One. 2010 Oct 29;5(10):e13751. (*denotes equal authorship) PMCID: PMC2966419
    c. Basanta D, **Strand DW**, Lukner R, Franco OE, Cliffel D, Ayala G, Hayward SW, Anderson ARA. The Role of TGF-Beta Mediated Tumor-stroma Interactions in Prostate Cancer Progression: An Integrative Approach. Cancer Res. 2009 Sep 1;69(17):7111-20. PMCID: PMC2748342
    d. **Strand DW**, Liang Y, Yang F, Barron DA, Ressler SJ, Schauer IG, Feng X, and Rowley DR. TGF-beta. induction of FGF-2 expression in stromal cells requires integrated Smad3 and MAPK pathways. Am J Clin Exp Urol. 2014 Oct 2;2(3):239-248. PMCID: PMC4219310

2. My contributions to science during postdoctoral training focused on the effects of metabolic regulators on prostate epithelial differentiation and disease. Benign prostatic hyperplasia is positively associated with metabolic disease and inflammation, but the underlying molecular connections are unclear. Using newly developed spontaneously immortalized mouse and human prostate epithelial cell lines, I was able to demonstrate that PPARgamma-regulated fatty acid metabolism regulates basal and luminal epithelial differentiation. I hope to make a connection between the recent advances in our broader understanding of metabolism and stem cell differentiation with the postulated role of stem cell differentiation in benign prostatic hyperplasia patients with metabolic disorders. I served as the secondary or primary investigator in these studies.

    a. Jiang M, **Strand DW**, Fernandez S, He Y, Yi Y**,** Birbach A, Schmid J, Qiu QC, Tang DG, Hayward SW. Functional Remodeling of Benign Human Prostatic Tissues in vivo by spontaneously immortalized progenitor and intermediate cells. Stem Cells. 2010 Feb 28(2):344-56. PMCID: PMC2962907
    b. Jiang M, **Strand DW**, Franco OE, Clark PE, Hayward SW. PPARgamma: A Molecular Link Between Systemic Metabolic Disease and Benign Prostate Hyperplasia. Differentiation 2011 Nov-Dec;82(4-5):220-36. PMCID: PMC3174339
    c. **Strand DW**, Jiang M, Murphy TA, Yi Y, Konvinse KC, Franco OE, Wang Y, Young JD, Hayward SW.

PPARgamma Isoforms Differentially Regulate Metabolic Pathways to Mediate Mouse Prostatic Epithelial Differentiation. Cell Death and Disease 2012 Aug 9;3:e361. PMCID: PMC3434663

d. **Strand DW***, DeGraff DA*, Jiang M, Sameni M, Franco OE, Love HD, Hayward WJ, Lin-Tsai O, Wang AY, Cates JM, Sloane BF, Matusik RJ, Hayward SW. Deficiency in Metabolic Regulators PPARgamma and PTEN Cooperates to Drive Keratinizing Squamous Metaplasia in Novel Models of Human Tissue Regeneration. Am J Path 2013 Feb; 182(2):449-59. (*denotes equal authorship) PMCID: PMC3562729

3. My most recent contribution has been to provide a cellular and molecular characterization of the normal human prostate and BPH. The molecular etiology of BPH has been particularly difficult to assess given the clinical and histological heterogeneity and the lack of access to normal and diseased human tissue. Studying this disease requires a long-term commitment to tissue and clinical data procurement, which has culminated in collaborative publications with surgeons, pathologists and bioinformaticists that provided keen insights into the cellular and molecular etiologies of BPH progression. I continue the search for new therapeutic targets in BPH progression through a cell-specific analysis of BPH, I served as the senior investigator in these studies.

   a. Henry G, Loof N, **Strand DW**. OMIP-40: Optimized gating of human prostate cellular subpopulations. Cytometry A. 2017 Aug 18. PMID:28834328
   b. **Strand DW**, Costa DN, Francis F, Ricke WA, Roehrborn CG. Targeting phenotypic heterogeneity in benign prostatic hyperplasia. Differentiation. 2017 Aug 4;96:49-61. PMID: 28800482
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   d. Henry GH, Malewska A, Joseph DB, Malladi VS, Lee J, Torrealba J, Mauck RJ, Gahan JC, Raj GV, Roehrborn CG, Hon GC, MacConmara MP, Reese JC, Hutchinson RC, Vezina CM, **Strand DW**. A cellular anatomy of the normal adult human prostate and prostatic urethra. Cell Reports. 2018 Dec 18;25(12):3530-42. PMID: 30566875

Complete List of Published Work in MyBibliography:

https://www.ncbi.nlm.nih.gov/myncbi/douglas.strand.1/bibliography/public/

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

1R01 DK115477-01 Strand (PI) 7/20/18-5/31/23
Notch-mediated 5ARI-resistance in human BPH
This project aims to determine whether inhibiting Notch signaling sensitizes nodular BPH to 5ARI treatment.
Role: Principal Investigator

1R21 AI1382501/IN4686396UTMC Arrizabalaga (PI) 5/8/18-4/30/20
Prostate pathogenesis during *Toxoplasma gondii* infection
This project aims to determine whether *Toxoplasma gondii* infection is correlated with human prostate pathogenesis
Role: Co-Investigator

U54 Ricke (PI) 12/1/2019 – 11/30/2024
University of Wisconsin-Madison - NIH-NIDDK
Cellular and molecular mediators of fibrosis in the development of urinary tract dysfunction: Project 2
This project aims to determine the role of SRD5A2+ peri-urethral fibroblasts in BPH/LUTS
Role: Co-Investigator

R01 Mani (PI) 1/1/2020 – 12/31/2024
UTSW Medical Center – NIH-NCI
3D genome architecture and the origins of recurrent genomic rearrangements in prostate cancer

The major goals of this project are to uncover the origins of genomic rearrangements in prostate cancer
Role: Co-Investigator

RP170152 Bagrodia (PI) 12/01/2016 – 11/30/2020
CPRIT
Targeting the H NF4A and WNT/Beta-Catenin Pathways in Childhood Malignant Yolk Sac Tumors
This project aims to determine the impact of HNF4A and WNT/beta-catenin signaling on the gene expression program and oncogenic potential of malignant yolk sac tumors
Role: Co-Investigator

Pending Research Support

R01 Xin (PI) 7/1/2020 – 6/30/2025
University of Washington - NIH-NIDDK
Molecular mechanisms of initiation of benign prostatic hyperplasia
This project aims to determine the role of proximal fibroblasts in stimulating proximal epithelial progenitors to expand
Role: Co-Investigator

R01 Jerde (PI) 4/1/2020-3/31/2025
NIH/NIDDK
Interleukin-1 and Steroid Signaling Drive Toxoplasma-induced Prostatic Hyperplasia
This project aims to determine the role of Toxoplasma gondii in prostate inflammation and growth

Completed Research Support Completed During the Last Three Years

SPG2015-001 Strand (PI) 01/01/16-03/31/16
UT Southwestern Center for Translational Medicine
Cell-specific mechanisms of BPH progression
This project aims to determine the molecular changes of basal epithelial cells during prostatic enlargement.
Role: Principal Investigator

1R03 DK110497 Strand (PI) 07/25/16-04/30/18
Interplay between stem cells and inflammation in Benign Prostatic Hyperplasia
This project aims to determine whether chronic inflammation increases the number of epithelial stem cells in prostatic enlargement.
Role: Principal Investigator

785K024 Strand (PI) 08/01/17-07/31/18
Board of Regents of the University of Wisconsin System
Mediators of fibrosis in the development of lower urinary tract dysfunction
Role: Principal Investigator

1K01DK098277-01A1 Strand (PI) 09/17/13 - 7/31/18
Mechanisms of Fatty Acid Metabolism in Prostate Differentiation and Disease
This project aims to determine the impact of systemic metabolic stress on local prostatic differentiation and response to therapy.
Role: Principal Investigator