MARK VANDER ROEST

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Education

* Vanderbilt University, Nashville, TN (Overall GPA: 3.93 / 4.00) Jun. 2014 – Dec. 2019

PhD - Biomedical Engineering

* University of Michigan, Ann Arbor, MI (Overall GPA: 3.91 / 4.00, Major GPA: 3.95 / 4.0) Aug. 2011 - May 2014

B.S.E. (*Summa Cum Laude*) - Biomedical Engineering, Biochemical focus

Research Experience

Assistant Research Scientist 2023-Present

University of Michigan, Ann Arbor, MI

-Investigating biological mechanisms and therapeutic applications of sHDL nanoparticles

-Developing methods for the identification of functional differences between innovator and biosimilar biologic drugs

Scientist Consultant 2023-Present

HepaTx, Palo Alto, CA

Scientist 2020 – 2023

HepaTx, Palo Alto, CA

- Developed in vivo testing platforms for cell-based liver therapeutics encompassing multiple hepatic disease models

- Managed downstream processing and data collection from all in vivo experiments

- Established in vitro release criteria and standardized collection methods for cell-based therapeutic products to enable broader data comparison and organization

- Developed novel in vitro assays for testing the therapeutic efficacy of cell-based products

- Additional responsibilities include cell culture, hepatic differentiation of adipose stem cells, common wet bench assays, data collection/processing/archive, maintenance of shared lab space in a fast-paced startup environment

Graduate Research Assistant 2014 - 2019

Merryman Mechanobiology Laboratory, Vanderbilt University, Nashville, TN

Advisor: W. David Merryman, Ph.D.

* Developed and investigated a protocol to apply mechanical strain during differentiation of human iPSCs
* Investigated the role of strain-induced expression of lncRNA *H19* during endothelial differentiation
* Determined expression patterns and epigenetic signatures of lncRNA *H19* in murine cardiovascular tissues
* Developed transgenic overexpression constructs for expression of lncRNA in induced pluripotent stem cells
* Designed and developed transgenic mouse embryonic stem cell line for future development of transgenic animals

Undergraduate Research Assistant 2012 - 2014

Cell Signaling in Engineered Tissues Laboratory, University of Michigan, Ann Arbor, MI

Advisor(s): Andrew Putnam, Ph.D.

* Fabricated and analyzed nano-patterned substrates for the osteogenic differentiation of mesenchymal stem cells (MSCs)
* Investigated the effects of substrate stiffness and patterning on the chondrogenic differentiation of MSCs

NCI-ICBP Summer Research Fellow 2013

National Cancer Institute – Integrative Cancer Biology Program, Vanderbilt University Medical Center, Nashville, TN

Advisor(s): Vito Quaranta, M.D., Peter Frick, Ph.D.

* Investigated the effect of combination drug treatment on clonal growth rate of lung cancer cell lines

Funding

Completed

-T32, National Institutes of Health (NIH T32HL007411).

*Training in cardiovascular research.*

Vanderbilt University Medical Center, Department of Medicine, Division of Cardiovascular Medicine.

Role: Trainee. 07/01/15 – 06/30/17. Total costs: $46,296 (2 years stipend assistance)

Pending

-DISC2, California Institute of Regenerative Medicine (CIRM DISC2-14202).

*Development of a proteomic assay for monitoring transplanted cells and tissues*

HepaTx.

Role: Principal investigator

Scholarships, Fellowships, and Academic Honors

Vanderbilt University

* University Graduate Fellowship 2014 – 2019
* Biomedical Engineering Outstanding Teaching Assistant 2015

University of Michigan

* Dean’s List 2011 - 2014
* University Honors 2011 - 2014
* James B. Angell Scholar 2013 - 2015

Publications

1. **Vander Roest MJ**, Merryman WD. A developmental approach to induced pluripotent stem cells-based tissue engineered heart valves. Future Cardiol. 2017 Jan;13(1):1-4. doi: 10.2217/fca-2016-0071. Epub 2016 Dec 19. PMID: 27990847.
2. **Vander Roest MJ**, Krapp C, Thorvaldsen JL, Bartolomei MS, Merryman WD. H19 is not hypomethylated or upregulated with age or sex in the aortic valves of mice. Physiol Rep. 2019 Oct;7(19):e14244. doi: 10.14814/phy2.14244. PMID: 31609547; PMCID: PMC6778597.
3. Raddatz MA, **Vander Roest MJ**, Merryman WD. Notch1 suppression by microRNA-34a: a new mechanism of calcific aortic valve disease. Cardiovasc Res. 2020 Apr 1;116(5):871-873. doi: 10.1093/cvr/cvz280. PMID: 31638138; PMCID: PMC7868662.
4. **Vander Roest MJ**, Merryman WD. Cyclic Strain Promotes *H19* Expression and Vascular Tube Formation in iPSC-Derived Endothelial Cells. Cell Mol Bioeng. 2020 May 7;13(4):369-377. doi: 10.1007/s12195-020-00617-0. PMID: 32952736; PMCID: PMC7479073.
5. Bogliotti Y, **Vander Roest MJ**, Mattis AN, Gish RG, Peltz G, Anwyl R, Kivlighn S, Schuur ER. Clinical Application of Induced Hepatocyte-like Cells Produced from Mesenchymal Stromal Cells: A Literature Review. Cells. 2022 Jun 22;11(13):1998. doi: 10.3390/cells11131998. PMID: 35805080; PMCID: PMC9265349.

Conference Presentations

(Presenting author underlined, \* denotes published abstract)

1. **Vander Roest, MJ**, Johnson, CL, Baldwin, HS, Merryman, WD.Shear Stress Maintains Endocardial Phenotype in iPSC Derived Endocardial Cells. *Arteriosclerosis, Thrombosis, and Vascular Biology (ATVB) Meeting*. Nashville, TN. 2016. (*Arteriosclerosis, Thrombosis, and Vascular Biology.* 36(S4): A60, 2016). [*Oral presentation and published abstract*]
2. **Vander Roest, MJ**, Johnson, CL, Baldwin, HS, Merryman, WD.Shear Stress Maintains Endocardial Phenotype in Induced Pluripotent Stem Cell Derived Endocardial Cells. *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*. National Harbor, MD. June 29-July 2, 2016. [*Oral*]
3. **Vander Roest, MJ**, Merryman, WD.Mechanical Strain is a Promoter of Endocardial Differentiation and May Act Through lncRNA *H19*. *Biomedical Engineering Society (BMES) Annual Meeting*. Phoenix, AZ. October 11-14, 2017. [*Oral*]
4. **Vander Roest, MJ**, Merryman, WD.Age and Gender Associated Changes in Aortic Valve Health Measured by Echocardiography. *Biomedical Engineering Society (BMES) Annual Meeting*. Atlanta, GA. October 17-20, 2018. [*Oral*]
5. Bogliotti, Y, **Vander Roest MJ**, Schuur E. A Novel Cell Therapy in Mice with Chemically Induced Acute Liver Injury Using Hepatocyte-like Cells Derived from ASCs. *The Liver Meeting*. Held digitally, November 12-15, 2021 [Poster]
6. Bogliotti Y, **Vander Roest MJ**, Anwyl R, Schuur E. Novel Hybrid Phenotypes of Adipose Stromal Cell-Derived Hepatocyte-Like Cells Demonstrate Improved Immunomodulatory Capabilities In Vitro and Effectiveness Against Acute Liver Injury In Vivo. *International Society for Cell and Gene Therapy*, May 2022 [Poster]

Supervisory / Mentorship Experience

Graduate student mentorship, various projects

-Kristen Hong-Dorsey, Troy Halseth, Julia Catalano, May Phoo 2023-Present

Training in standard wet lab experimental protocols

-Robin Anwyl – Research Associate/direct report 2021-2022

Testing of Inotropic Agents on Endocardial EMT in an Ex Vivo Cushion Assay

-Michelle Biesman – Hapeth Hall Winterim Research Program 2015

Teaching Experience

Teaching Assistant Fall 2014

Biomechanics and Biomaterials \*/ Supervised by: Dr. W. David Merryman / Vanderbilt University

* *Held biweekly help sessions to supplement in-class instruction, review course material and grade all assignments and exams*
* *Instructed class for MATLAB programming sessions and during instructors absence*

Teaching Assistant Spring 2015

Nanobiotechnology\* / Supervised by: Dr. Todd D. Giorgio / Vanderbilt University

* *Held biweekly help sessions to supplement in-class instruction, review course material and grade all assignments and exams*

\*Awarded departmental Outstanding TA award

Invited Talks

Cardiovascular Research Seminar Series | Vanderbilt University 2016

*Title: Shear stress mediated differentiation of iPSCs to endocardial cells*

Academic Service

Journal Referee

Arteriosclerosis, Thrombosis, and Vascular Biology (ATVB); Tissue Engineering, Nanomedicine NBM

Society Memberships

* Biomedical Engineering Society (BMES)
* Summer Biomechanics, Bioengineering, and Biotransport Conference Foundation (SB3C)