



Doctoral Dissertation Defense Announcement



Candidate for Doctor of Philosophy
Cell and Developmental Biology

PhD (Mentor)

Brian Link, PhD

Allison Ebert, PhD

Kenichiro Taniguchi

4

10:00 AM (CST)

Bolger Auditorium

Contact thunyenyiwa@mcw.edu for zoom link

Foundations of Biomedical Sciences I-IV
Techniques in molecular and cell biology
Professional Development I-II
Writing a Scientific Paper
Writing Individual Fellowship
Reading and Research
Statistics for Basic Sciences
Organ Systems Physiology
Advanced Cell Biology
Developmental and Stem Cell Biology
Research Ethics Discussion Series
Ethics & Integrity in Science
Journal Club
Current Concepts of Cardiovascular Biology
Doctoral Dissertation

effects. This study demonstrated that regenerative lung growth and expression of vascular endothelial growth factor VEGF, its receptor VEGFR2 and transcription factor TWIST1 are induced by PNx, while the effects are inhibited in *Lep^{ob/ob}* obese mice and adiponectin knockout mice. The levels of adiponectin, increase in mouse lungs after unilateral PNx, while the effects are attenuated in *Lep^{ob/ob}* obese mice. Adiponectin agonist, AdipoRon stimulates post-PNx lung growth and vascular and alveolar regeneration in *Lep^{ob/ob}* obese mice. Adiponectin stimulates angiogenic activities in lean and obese human lung endothelial cells (ECs), which is inhibited by Twist1 knockdown. These findings suggest that obesity impairs lung vascular and alveolar regeneration.

This thesis revealed potential candidate

Education

- 2019-2024 (expected) Ph.D. Cell and Developmental Biology
Medical College of Wisconsin, WI
- 2017-2019 MS Biology
Andrews University, MI
- 2012-2016 Bachelor of Science Biology
Southwestern Adventist University, TX

Research Experience

- 2019-present **Research Assistant , Medical College of Wisconsin, WI**
Effects of obesity on angiogenesis using human subcutaneous adipose endothelial cells
-Gene manipulation and nucleic acid isolation in endothelial cells
-Migration and Edu assay
-Immunocytochemistry on endothelial cells
Effects of obesity on lung regeneration
-Biomolecule extraction (DNA, RNA, protein, exosomes) from tissues and cells
-Immunohistochemistry on lung tissues
-Next-Generation Sequencing: library preparation and data analysis
- 2017-2019 **Research Assistant, Andrews University , MI**
Effects of novel dihydropyridines on glioblastoma
-Made hybrid dihydropyridines following the Hantzsch reaction
-Used NMR /IR for identification and purity check
-Performed a cell viability test and established LD50
-Maintained and used Glioblastoma cell-line U87
-Performed invasion assay, scratch assay

- 2018-2019 Graduate Student Grant in Aid of Research and Proposals Robson Newbold School Grad (Andrews University)
- 2013-2016 Silver Award: Scholarship award presented for maintaining a GPA above 3.5 (Southwestern Adventist University)

Peer Reviewed Publications

- Kyi, P., Hendee, K., **Hunyenyiwa, T.**, Matus, K., Mammoto, T., & Mammoto, A. (2022). Endothelial senescence mediates hypoxia-induced vascular remodeling by modulating PDGFB expression. *Frontiers in medicine*, 9, 908639. <https://doi.org/10.3389/fmed.2022.908639>
- Mammoto, T., **Hunyenyiwa, T.**, Kyi, P., Hendee, K., Matus, K., Rao, S., Lee, S. H., Tabima, D. M., Chesler, N. C., & Mammoto, A. (2022). Hydrostatic Pressure Controls Angiogenesis Through Endothelial YAP1 During Lung Regeneration. *Frontiers in bioengineering and biotechnology*, 10, 823642. <https://doi.org/10.3389/fbioe.2022.823642>
- Hunyenyiwa, T.**, Hendee, K., Matus, K., Kyi, P., Mammoto, T., & Mammoto, A. (2021). Obesity Inhibits Angiogenesis Through TWIST1-SLIT2 Signaling. *Frontiers in cell and developmental biology*, 9, 693410. <https://doi.org/10.3389/fcell.2021.693410>
- Hendee, K., **Hunyenyiwa, T.**, Matus, K., Toledo, M., Mammoto, A., & Mammoto, T. (2021). Twist1 signaling in age-dependent decline in angiogenesis and lung regeneration. *Aging*, 13(6), 7781–7799. <https://doi.org/10.18632/aging.202875>

Manuscripts Submitted

- Hunyenyiwa, T.**, Kyi, P., Johnstone, D., Mammoto, T., & Mammoto, A., (2024). Adiponectin mediates inhibition of angiogenesis and regenerative lung growth in *Lep^{ob/ob}* mice.

Oral Presentations (external)

- Hunyenyiwa, T.**, Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2024). Obesity in Angiogenesis and Regenerative Lung Growth. Presented at NAVBO InFocus - Vascular Metabolism.
- Hunyenyiwa, T.**, Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2023). Obesity in Angiogenesis and Regenerative Lung Growth. Presented at Vascular Biology 2023.
- Hunyenyiwa, T.**, Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2022). Obesity in lung vascular and alveolar regeneration. Presented at Pathology for Investigators, Students, and Academicians (PISA) 2022.
- Hunyenyiwa, T.**, Hendee, K., Matus, K., Kyi, P., Mammoto, T., & Mammoto, A. (2021). Obesity inhibits angiogenesis through TWIST1-SLIT2 signaling. Presented at the Adipose Biology Seminar Series.
- Hunyenyiwa, T.**, Hendee, K., Matus, K., Kyi, P., Mammoto, T., & Mammoto, A. (2021). Obesity inhibits angiogenesis through TWIST1-SLIT2 signaling. Presented at Vascular Biology 2021.
- Hunyenyiwa, T.**, Hendee, K., Matus, K., Mammoto, T., & Mammoto, A. (2021). Obesity Inhibits Angiogenesis through TWIST1-SLIT2 Signaling.

Presented at Pathology for Investigators, Students, and Academicians (PISA) 2021.

Hunyenyiwa, T., Hendee, K., Matus, K., Mammoto, T., & Mammoto, A. (2021). ROBO/SLIT in Obesity-dependent Changes in Angiogenesis and Lung Regeneration. Presented at Experimental Biology 2021.

Hunyenyiwa, T., Smith, D., & Murray, D. (2018). A-2 The Effects of Novel Dihydropyridine Derivatives as Anti-invasive Agents Against Glioblastoma. Presented at the Michigan Academy of Science, Arts, & Letters.

Oral Presentations (MCW)

Hunyenyiwa, T., Hendee, K., Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2022). The effects of obesity on adipose tissue remodeling. Presented at the Cell Biology, Neurobiology & Anatomy Seminar Series.

Hunyenyiwa, T., Hendee, K., Matus, K., Mammoto, T., & Mammoto, A. (2021). Obesity in angiogenesis and lung re

Hunyenyiwa, T., Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2022). Effects of obesity in angiogenesis and regenerative lung growth. Presented at the 32nd Annual Graduate School Research Poster Session.

Hunyenyiwa, T., Kyi, P., Matus, K., Mammoto, T., & Mammoto, A. (2022). Effects of obesity in angiogenesis and regenerative lung growth. Presented at the CVC Research Retreat.

Hunyenyiwa, T., Hendee, K., Matus, K., Kyi, P., Mammoto, T., & Mammoto, A. (2021). Obesity inhibits angiogenesis through TWIST1-SLIT2 signaling. Presented at the 31st Annual Graduate School Research Poster Session.

Hunyenyiwa, T., Hendee, K., Matus, K., Kyi, P., Mammoto, T., & Mammoto, A. (2021). Inhibition of angiogenesis in obese adipose tissue through TWIST1-SLIT2 signaling. Presented at the CVC Research Retreat.

Hunyenyiwa, T., Hendee, K., Matus, K., Mammoto, T., & Mammoto, A. (2021). Obesity in vascular and alveolar morphogenesis after pneumonectomy. Presented at the 30th Annual Graduate School Research Poster Session.

Positions and Employment

2017-2019 Head Biology Teaching Assistant, Andrews University, Berrien Springs MI
 2016-2017 Science Teacher, Ketchum Adventist Academy, Ketchum, OK

2023 - American Association for Cell Biology; Trainee Member
 2022 - American Heart Association; Trainee Member
 2020 - North American Vascular Biology Organization (NAVBO); Trainee Member
 2020 - American Society for Investigative Pathology (ASIP); Trainee Member

2023 Organizer, Vascular Biology Society of America (VBSA) •