Curriculum Vita

Ibra (Drew) S Fancher, IV, PhD *Assistant Professor – Tenure Track*

Address: University of Delaware
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Education and Training:

2014-2019 Postdoctoral position at the University of Illinois, Chicago

2009-2014 Ph.D.; Exercise Physiology; West Virginia University School of Medicine

2005-2009 B.S.; Biology; St. Vincent College; Latrobe, PA

Positions:

August 2020 – present
Assistant Professor, Dept. of Kinesiology and Applied Physiology, University of Delaware

April 2019 – August 2020
Research Assistant Professor in the laboratory of Irena Levitan at the University of Illinois, Chicago

Grant Support:

Current:

P20GM113125-06 (Edwards, University of Delaware)
09/01/2021 – 05/31/2024
NIH NIGMS
Obesity-Induced Endothelial Dysfunction in Arteries of Visceral Adipose
Role: Project Lead

University of Delaware Research Funds (Fancher, University of Delaware)
06/01/2024 – 05/31/2026
UDRF Seed Funding
Harnessing adipose adaptations to prevent endothelial dysfunction in obesity
Role: PI

Completed:

GUR Seed Funding (Fancher, University of Delaware)
08/01/2021 – 07/31/2023
General University Research Grant
Assessing the dichotomy of vascular function in obesity: Why are some vascular beds impaired while others are spared?
Role: PI

T32HL007829 (Malik, University of Illinois at Chicago)
02/01/2018 – 12/31/2018
NIH NHLBI
Role: Postdoctoral Fellow

16POST27000011 (Fancher, University of Illinois at Chicago)
01/01/2016 – 12/31/2017
American Heart Association Postdoctoral Fellowship
Role: PI

T32HL082547 (Dudek, University of Illinois at Chicago)
02/05/2015 – 05/31/2015
NIH NHLBI
Role: Postdoctoral Fellow

T32 DK080674 (Unterman, University of Illinois at Chicago)
02/05/2014 – 01/31/2015
NIH NIDDK
Role: Postdoctoral Fellow

Awards and Honors:

University of Delaware INBRE Start-up Award ($25,000)
08/19/2021

University of Delaware INBRE Core Center Access Award ($4,000)
03/01/2021

Commencement speaker (student representative) at West Virginia University
05/20/2015

Interviews/Press:

University of Illinois at Chicago Alumni Spotlight Spring 2021 edition

Peer-reviewed publications – University of Delaware

*Authors contributed equally, **corresponding author, †senior author

1. Alradi M, Askari H, Shaw M, Bhavsar JD, Kingham BF, Polson SW, **†**Fancher IS**. A long-term high fat diet induces differential gene expression changes in spatially distinct adipose tissue of male mice. Physiol Genomics. 2024 Dec 1;56(12):819-832. doi: 10.1152/physiolgenomics.00080.2024. *Article highlighted in December's APSSelect. APS published a Press Release on the manuscript on 12/12/2024.*

2. Do Couto NF, **Fancher I**, Granados ST, Cavalcante-Silva J, Beverley KM, Ahn SJ, Hwang CL, Phillips SA, Levitan I. Impairment of Microvascular Endothelial Kir2.1 Channels Contributes to Endothelial Dysfunction in Human Hypertension. Am J Physiol Heart Circ Physiol. 2024 Oct 1;327(4):H1004-H1015. doi: 10.1152/ajpheart.00732.2023. *Article received Editorial Focus titled "Ebbs and tides of endothelial K^+ currents that regulate blood flow." 25 Oct 2024 https://doi.org/10.1152/ajpheart.00678.2024.*

3. Rokka S, Sadeghinejad M, Hudgins EC, Johnson EJ, Nguyen T, **†**Fancher IS**. Visceral adipose of obese mice inhibits endothelial inwardly rectifying K^+ channels in a CD36-dependent fashion. Am J Physiol Cell Physiol. 2024 May1;326(5):C1543-C1555. doi: https://doi.org/10.1152/ajpcell.00073.2024.

4. DeConne TM, **Fancher IS**, Edwards DG, Trott DW, Martens CR. CD8+ T-cell metabolism is related to cerebrovascular function in middle-aged adults. Am J Physiol Regul Integr Comp Physiol. 2024 May 1;326(5):R416-R426. doi: 10.1152/ajpregu.00267.2023.

5. ****Fancher IS** and Levitan I. Membrane Cholesterol Interactions with Proteins in Hypercholesterolemia-Induced Endothelial Dysfunction. Curr Atheroscler Rep 2023 Sep;25(9):535-541. https://doi.org/10.1007/s11883-023-01127-w.

6. Watso JC, **Fancher IS**, Gomez DH, Hutchison ZJ, Gutiérrez OM, Robinson AT. The damaging duo: Obesity and excess dietary salt contribute to hypertension and cardiovascular disease. Obes Rev. 2023 Aug;24(8):e13589. doi: 10.1111/obr.13589.

7. SenthilKumar G, Gutierrez-Huerta CA, Freed JK, Beyer AM, **Fancher IS**, and LeBlanc A. New Developments in Translational Microcirculatory Research. Am J Physiol Heart Circ Physiol. 2022 Dec 1;323(6):H1167-H1175. doi: 10.1152/ajpheart.00566.2022.

8. Nguyen T, Ahn SJ, West R, †**Fancher IS**. Isolation and identification of vascular endothelial cells from distinct adipose depots for downstream applications. J Vis Exp. 2022. (184). doi:10.3791/63999.

9. Hudgins EC, Bonar AM, Nguyen T, †**Fancher IS**. Targeting lipid-ion channel interactions in cardiovascular disease. Front Cardiovasc Med. 2022. 6;9:876634. doi: 10.3389/fcvm.2022.876634. eCollection 2022.

10. Nunan E, Wright CL, Semola OA, Subramanian M, Balasubramanian P, Lovern PC, **Fancher IS**, Butcher JT. Obesity as a premature aging phenotype – implications for sarcopenic obesity. Geroscience. 2022. doi: 10.1007/s11357-022-00568-7.

11. Ahn SJ, Le Master E, Lee JC, Phillips SA, Levitan I, †**Fancher IS**. Differential effects of obesity on visceral vs. subcutaneous adipose arteries: role of shear activated Kir2.1 and

alterations to the glycocalyx. Am J Physiol Heart Circ Physiol. 2022 Feb 1;322(2):H156-H166. doi: 10.1152/ajpheart.00399.2021.

12. *Ahn SJ, ***Fancher IS**, *Granados ST, Do Couto NF, Hwang CL, Phillips SA, Levitan I. Cholesterol-Induced Suppression of Endothelial Kir Channels is a Driver of Impairment of Arteriolar Flow-Induced Vasodilation in Humans. Hypertension. 2022 Jan;79(1):126-138. doi: 10.1161/HYPERTENSIONAHA.121.17672.

13. Hwang CL, Chen SH, Chou CH, Grigoriadis G, Liao TC, **Fancher IS**, Arena R, Phillips SA. The physiological benefits of sitting less and moving more: Opportunities for future research. Prog Cardiovasc Dis. 2021 Jan 13;S0033-0620(21)00003-7. https://doi.org/10.1016/j.pcad.2020.12.010

14. **Fancher IS**, Le Master E, Ahn SJ, Adamos C, Lee JC, Berdyshev E, Dull RO, Phillips SA, Levitan I. Impairment of Flow-Sensitive Inwardly Rectifying K+ Channels via Disruption of Glycocalyx Mediates Obesity-Induced Endothelial Dysfunction. Arterioscler Thromb Vasc Biol. 2020 Sep;40(9):e240-e255. doi: 10.1161/ATVBAHA.120.314935.

Other Peer Reviewed Publications

15. Bogachkov YY, Chen L, Le Master E, **Fancher IS**, Zhao Y, Aguilar V, Oh MJ, Wary KK, DiPietro LA, Levitan I. LDL induces cholesterol loading and inhibits endothelial proliferation and angiogenesis in Matrigels: correlation with impaired angiogenesis during wound healing. Am J Physiol Cell Physiol. 2020 Apr 1;318(4):C762-C776. doi: 10.1152/ajpcell.00495.2018.

16. ****Fancher IS** and Levitan I. Electrophysiological recordings of single-cell ion currents under well-defined shear stress. J Vis Exp. 2019 Aug 2;(150). doi: 10.3791/59776.

17. Boriushkin E, **Fancher IS**, and Levitan I. Shear-stress sensitive inwardly-rectifying K+ channels regulate developmental retinal angiogenesis by vessel regression. Cell Physiol Biochem. 2019;52(6):1569-1583. doi: 10.33594/000000109.

18. **Fancher IS**, Rubenstein I, Levitan I. Potential strategies to reduce blood pressure in treatment resistant hypertension using FDA-approved nanodrug delivery platforms. Hypertension. 2019 Feb;73(2):250-257. doi: 10.1161/HYPERTENSIONAHA.118.12005.

19. LeMaster E, **Fancher IS,** Lee J, and Levitan I. Comparative analysis of endothelial cell and sub-endothelial cell elastic moduli in young and aged mice: Role of CD36. J BioMech. 2018 Jul 25;76:263-268. doi: 10.1016/j.jbiomech.2018.06.007.

20. **Fancher IS**, Ahn SJ, Adamos C, Osborn C, Oh MJ, Fang Y, Reardon CA, Getz GS, Phillips SA, Levitan I. Hypercholesterolemia-Induced Loss of Flow-Induced Vasodilation and Lesion Formation in Apolioprotein E-Deficient Mice Critically Depend on Inwardly Rectifying K^+ Channels. J Am Heart Assoc. 2018 Mar 3;7(5). Pii: e007430. doi: 10.1161/JAHA.117.007430. Received Editorial in JAHA entitled “Regulation of Kir2.1 Function Under Shear stress and Cholesterol Loading.” doi: 10.1161/JAHA.118.008749

21. LeMaster E, Huang RT, Zhang C, Bogachkov Y, Coles C, Shentu TP, Sheng Y, **Fancher**

IS, Ng C, Christoforidis T, Subbaiah PV, Berdyshev E, Qain Z, Eddington D, Lee J, Cho M, Fang Y, Minshall RD, and Levitan I. Proatherogenic Flow Increases Endothelial Stiffness via Enhanced CD36 (Cluster of Differentiation 36)-Mediated OxLDLD (Oxidized Low-Density Lipoprotein) Upatke. Aterieoscler Thromb Vasc Biol. 2018 Jan;38(1):64-75. doi: 10.1161/ATVBAHA.117.309907

22. Robinson AT, **Fancher IS**, Mahumoud AM, Phillips SA. Microvascular Vasodilator Plasticity Following Acute Exercise. Exerc Sport Sci Rev. 2018 Jan;46(1):48-55. doi: 10.1249/JES.0000000000000130

23. *Zinkevich NS, ***Fancher IS**, Gutterman DG, Phillips SA. Roles of NADPH-oxidase and mitochondria in flow-induced vasodilation of human adipose arterioles: ROS induced ROS release in coronary artery disease. Microcirculation. 2017 Aug;24(6). doi: 10.1111/micc.12380

24. Ozemek C, Phillips SA, Popovic D, Laddu-Patel D, **Fancher IS**, Arena R, Lavie CJ. Nonpharmacologic management of hypertension: a multidisciplinary approach. Curr Opin Cardiol. 2017 Jul;32(4):381-388. doi: 10.1097/HCO.0000000000000406

25. Robinson AR, **Fancher IS**, Sudhahar V, Bian JT, Cook MD, Ushio-Fukai M, Brown MD, Fukai T, and Phillips SA. Short-term Regular Aerobic Exercise Reduces Oxidative Stress Produced by Acute High Intraluminal Pressure in the Adipose Microvasculature. AJP Heart and Circ. 2017 May 1; 312(5):H896-H906. doi: 10.1152/ajpheart.00684.2016

26. Ahn SJ, **Fancher IS**, Bian JT, Zhang CX, Schwab S, Gaffin R, Phillips SA, and Levitan I. Inwardly-rectifying K+ channels are major contributors to flow-induced vasodilation in resistance arteries. J Physiol. 2017 April 1; 595(7):2339-2364. doi: 10.1113/JP273255

27. DelloStritto D, Connell PJ, Dick GM, **Fancher IS**, Klarich B, Fahmy JN, Kang PT, Chen YR, Damron DS, Thodeti CK, and Bratz IN. Differential regulation of TRPV1 channels by H_2O_2: implications for diabetic microvascular dysfunction. Basic Res Cardiol. 2016 Mar;111(2):21. doi: 10.1007/s00395-016-0539-4

28. **Fancher IS**, Butcher JT, Brooks SD, Rottgen TS, Skaff PR, Frisbee JC, and Dick GM. DPO-1-sensitive K^+ channels contribute to the vascular tone and reactivity of resistance arteries from brain and skeletal muscle. Microcirculation. 2015 May;22(4):315-25. doi: 10.1111/micc.12201

29. *Rottgen TS, ***Fancher IS**, Asano S, Widlanski TS, Dick GM. Bisphenol A activates BK channels through effects on α and β1 subunits. Channels. 2014 Jan 29;8(3), 1-9. doi: 10.4161/chan.27709
*Authors contributed equally.

30. **Fancher IS**, Dick GM, Hollander JM. Diabetes reduces the function and expression of ATP-dependent K^+ channels in cardiac mitochondria. Life Sci. 2013 Mar 28;92(11):664-8. doi: 10.1016/j.lfs.2012.11.019

31. Asano S, Bratz IN, Berwick ZC, **Fancher IS**, Tune JD, Dick GM. Penitrem A as a tool to understand the role of BK channels in vascular function. J Pharmacol Exp Ther. 2012

Aug;342(2):453-60. doi: 10.1124/jpet.111.191072

Invited Book chapters and Commentaries

#Published while at University of Delaware

1. Askari H, Sadeghinejad M, **#†Fancher IS**. Mechanotransduction and the endothelial glycocalyx: Interactions with membrane and cytoskeletal proteins to transduce force. Curr top Membr. 2023;91:43-60. doi: 10.1016/bs.ctm.2023.02.003.
   Volume 91 Preface by Guest Editors Ibra S Fancher and Andreia Z Chignalia doi: 10.1016/S1063-5823(23)00015-7.

2. **#Fancher IS** and Levitan I. Channelosome and intracellular K+ channels in arrhythmia. Nat Cardiovas Res. 2022 October 17; (1): 874–875.

3. **#**Fancher IS**. Cardiovascular Mechanosensitive Ion Channels – Translating physical forces into physiological responses. Curr Top Membr. 2021;87:47-95. doi: 10.1016/bs.ctm.2021.07.001. Epub 2021 Oct 7. doi: 10.1016/bs.ctm.2021.07.001

4. ****Fancher IS** and Levitan I. Endothelial inwardly-rectifying K^+ channels as a key component of shear stress-induced mechanotransduction. Ion Channels and Ca^{2+} Signaling in the Microcirculation. Curr Top Membr. 2020 May; Ch. 3: 59-88. doi: 10.1016/bs.ctm.2020.02.002

5. Levitan I, **Fancher IS**, Berdyshev E. Association of circulating oxidized lipids with cardiovascular outcomes. Lipidomics in Health and Disease: Methods and Application. 2018; Ch.9: 137-154.

6. **Fancher IS**, Robinson AT, and Phillips, SA. Crosstalk Debate: Comment on "Acute exercise elicits damage to the endothelial layer of systemic blood vessels in healthy individuals" entitled *A necessary distinction when discussing acute exercise and the endothelium*. J Physiol 0.0 (2018) pp 1-7.

7. Levitan I, **Fancher IS**, Ahn SJ, and Rosenhouse-Dantsker A. Physiological roles and cholesterol sensitivity of endothelial inwardly-rectifying K+ channels: specific cholesterol-protein interactions through nonannular binding sites. Vascular Ion Channels in Physiology and Disease. 2016 Sept; Ch.15: 327-347.

Invited Presentations/Symposia:

9th National IDeA Symposium of Biomedical Research Excellence 2024:
Title: Visceral adipose of obese mice inhibits endothelial inwardly rectifying K+ channels in a CD36-dependent fashion. June 19th, 2024.

University of Delaware, Department of Biological Sciences 2021 Fall Seminar Series.
Title: Obesity and Endothelial Dysfunction: Impairment of Flow-sensitive Kir Channels in Distinct Vascular Beds. September 13th, 2021; in-person and virtual.

University of Illinois at Chicago, Diabetes & Obesity Research Seminar Series.

Title: Impairment of Flow-Sensitive Inwardly Rectifying K+ Channels via Disruption of Glycocalyx Mediates Obesity-Induced Endothelial Dysfunction. April 14, 2021; virtual.

2018 Rapid Oral Fire Presentation at American Heart Association, Scientific Sessions, Chicago, IL.
Session Title: Revelation of unprecedented molecular mechanisms of endothelial dysfunction
Abstract Title: Obesity Induces Endothelial Dysfunction in Arteries of Visceral Adipose Through Impairment of the Inwardly Rectifying K+ (Kir2.1) Channel. November 12, 2018.

2017 South Eastern Lipid Research Conference/UK Cardiovascular Research Day.
Title: Hypercholesterolemia-induced endothelial dysfunction is rescued by overexpression of endothelial Kir2.1 in resistance arteries. November 3, 2017.

Teaching and Mentoring:

Courses:

KAAP220: Fundamentals of Anatomy and Physiology I	Fall 2020 – present
BISC564 (guest lecturer)	Spring 2022 – Spring 2023
KAAP640: Topics in Physiology – Cellular Physiology	Spring 2024 - present

Current Trainees and Staff:

Bhaswati Kashyap, Postdoctoral Researcher
2023-present

Emma Hudgins, Part time Research Scientist
2024-present

Sabita Rokka, MS Student Candidate in Exercise Science
2022-present

Erica Johnson, PhD Student, Applied Physiology
2022-present

Malak Alradi, PhD Student, Biological Sciences
2022-present

Halley Wisner, Shared (50%) RAII
2022-present

Past Trainees:

Lauren Mahoney, Undergraduate Researcher
2023-2024

Emma Hudgins, COBRE Supported Undergraduate Researcher
2021-2023
PhD student in Fancher Lab at UD

Adam Bonar, COBRE Supported Undergraduate Researcher
2021-2023
Medical Student at Thomas Jefferson Medical School, PA

Thanh Nguyen, Research Associate II
2021-2023
Research Scientist at Mayo Clinic, MN

Service:

Department of Kinesiology and Applied Physiology Committees

Awards Committee, Member	Spring 2021 – present
Safety Committee, Member	Spring 2023 – present
Dissertation Grants Committee, Member	Spring 2023 – present

Membership in Professional Organizations

American Physiological Society
2012-present

American Heart Association
2013-present

Microcirculatory Society
2020-present
Co-chaired Microcirculatory webinar series on 10/23/2020
Series title: “Cerebrovascular Health in Aging and Obesity.”

North American Vascular Biology Organization
2015-2018

Member of the UIC Postdoctoral Association
2015-2019

Editorial Contributions:

Frontier Research Topic: *Lipids in Mechanobiology*. Topic Editor, 2021.

Current Topics in Membranes, Vol 91: *The Cardiovascular Glycocalyx in Health and Disease*. Co-Editor, 2023

Reviewer Contributions:

Nature Communications (Impact factor: 16.6)

AJP Heart & Circ (Impact factor: 5.125)

Microcirculation (Impact factor: 2.110)

Cellular and Molecular Life Sciences (Impact factor: 6.496)

Medicine and Science in Sports and Exercise (Impact factor: 4.029)

Cells (Impact factor: 4.326)

Experimental Physiology (Impact factor: 2.969)

Scientific Reports (Impact factor: 4.379)

Hypertension (Impact factor: 10.19)

Frontiers Journals

Study Section:

American Heart Association – Pre and Postdoctoral Fellowships
Graduate Women in Science
NIH Early Career Reviewer