

CURRICULUM VITAE

Julie K. Freed PhD, MD

**Senior Associate Dean, Institute Director, Associate Professor
Department of Anesthesiology**

OFFICE ADDRESS:

8701 Watertown Plank Road

Milwaukee, WI 53226

EDUCATION:

09/01/1998 - 06/20/2002 BA, University of Minnesota, Minneapolis, MN

08/01/2003 - 05/19/2008 PhD, Medical College of Wisconsin, Milwaukee, WI

08/16/2007 - 05/20/2011 MD, Medical College of Wisconsin, Milwaukee, WI

POSTGRADUATE TRAINING AND FELLOWSHIP APPOINTMENTS:

07/01/2011 - 06/30/2016 Resident, Anesthesiology, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226

07/01/2016 - 06/30/2017 Fellow, Adult Cardiothoracic Anesthesia, Anesthesiology, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226

FACULTY APPOINTMENTS:

07/01/2017 - Present Assistant Professor, Anesthesiology, Cardiothoracic, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226

04/2020 - Present Assistant Professor, Physiology, Medical College of Wisconsin

07/01/2021 - Present Associate Professor, Anesthesiology, Adult Cardiothoracic Anesthesia, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226

RESEARCH ADMINISTRATIVE APPOINTMENTS:

2018 - Present Director, Clinical Research, Anesthesiology, Medical College of Wisconsin, Milwaukee, WI 53226

HOSPITAL STAFF PRIVILEGES:

07/10/2017 - Present Staff Physician, Anesthesiology, Adult Cardiothoracic, Medical College of Wisconsin, Milwaukee, WI 53226

SPECIALTY BOARDS AND CERTIFICATION:

<u>Board Certified</u>	<u>Issue Date</u>	<u>Expiration</u>
Anesthesiology	07/10/2017	12/31/2027
Advanced Perioperative Transesophageal Echocardiography	03/2020	None

<u>Licensure</u>	<u>Number</u>	<u>Issue Date</u>	<u>Expiration</u>
Wisconsin State	58667-20	10/25/2012	10/31/2021

AWARDS AND HONORS:

05/20/1999 - 05/21/2002 Patty Berg Scholar Award , University of Minnesota
 2008 Excellence in Physiology, Medical College of Wisconsin
 2011 JJ Smith Award in Physiology, Medical College of Wisconsin
 2011 Wilson Phillips Award in Anesthesiology, Medical College of Wisconsin
 2011 - 2016 Ruth L. Kirschstein Institutional National Research Service Award, NIGMS
 2012 First place, Critical Care Section, Midwest Anesthesiology Resident's Conference
 2012 ATVB Young Investigator Travel Award, American Heart Association
 2013 MCWAH Research Award, Medical College of Wisconsin Affiliated Hospitals
 2013 ATVB Young Investigator Travel Award, American Heart Association
 2013 FAER Resident Scholar, Foundation for Anesthesia Education and Research
 2013 MCW Outstanding Medical Student Teacher Award, Medical College of Wisconsin
 2013 MCW Research Day New Investigator Award, Basic Science, Medical College of Wisconsin
 2014 Pursuing Organizational Excellence Together (POET) Award, Froedtert Memorial Lutheran Hospital
 2015 Excellence in Teaching Anesthesiology, Medical College of Wisconsin
 2015 MCW Research Day New Investigator Award, Basic Science, Medical College of Wisconsin
 2015 ATVB Young Investigator Travel Award, American Heart Association
 2016 Wilson Phillips Award in Anesthesiology, for recognition of teamwork, compassionate care and outstanding academic and clinical achievement, Medical College of Wisconsin
 2016 - 2018 NIH Loan Repayment Award Recipient, NHLBI
 2017 First Place, Resident Research Contest, Post Graduate Assembly , New York Society of Anesthesiology
 2017 - 2018 MCW Outstanding Medical Student Teacher, Medical College of Wisconsin
 2018 - 2019 Cullen Healthy Heart Scholar Award
 - 2020 Women In Science Rising Pioneer Award, Medical College of Wisconsin

MEMBERSHIPS IN HONORARY AND PROFESSIONAL SOCIETIES:

2004 - Present American Physiological Society, Cardiovascular Section (Member)
 2006 - Present Microcirculatory Society (Member)
 2008 - 2012 American College of Physicians (Member)
 2008 - Present American Medical Association (Member)
 2010 - 2012 American Physician Scientist Association (Member)
 2011 - Present Wisconsin Society of Anesthesiology (Member)
 2011 - Present American Society of Anesthesiology (Member)
 2012 - Present American Heart Association, Council on ATVB, Council on Cardiovascular Surgery and Anesthesia (Member)
 2015 - Present Early-Stage Anesthesia Scholars (eSAS) (Co-President)
 2017 - Present American Society of Echocardiography (Member)
 2017 - Present International Anesthesia Research Society (member)
 2017 - Present Society of Cardiovascular Anesthesiologists (Member)
 2018 - Present Association of University Anesthesiologists (Member)

EDITORSHIPS/EDITORIAL BOARDS/JOURNAL REVIEWS:

Editorial Board

2018 - Present American Journal of Physiology, Heart and Circulatory Physiology
 2020 - Present Circulation Research
 2020 - Present Journal of Cardiac and Vascular Anesthesia

Journal Review

2014 - Present Circulation Research
 2015 - Present American Journal of Physiology: Heart and Circulatory Physiology
 2016 - Present International Journal of Cardiology
 2016 - Present American Journal of Physiology: Cell Physiology
 2016 - Present Canadian Journal of Pharmacology and Physiology
 2017 - Present British Journal of Anesthesia
 2018 - Present American Journal of Physiology: Endocrinology and Metabolism
 2018 - Present Journal of Applied Physiology
 2021 - Present Hypertension
 2021 - Present Journal of Clinical Anesthesia
 2021 - Present American Journal of Physiology: Regulatory, Integrative and Comparative Physiology

2021 - Present Trends in Anaesthesia and Critical Care
2021 - Present Reviews in Cardiovascular Medicine
Ad-Hoc Reviewer
2020 - Present British Medical Journal
2020 - Present Translational Research

LOCAL/REGIONAL APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

2014 - 2017 Chair, Microvesicle Affinity Group, MCW Cardiovascular Center
2016 - 2017 Member, Blue Ribbon Committee, MCW Cardiovascular Center
2017 - Present member, Anesthesia Equipment Committee, Froedtert Hospital
2018 - Present member, Clinical Translational Science Institute (CTSI) Study Section, Medical College of Wisconsin
2018 - Present member, Academic Time Committee, Medical College of Wisconsin, Dept of Anesthesiology
2019 - Present member, MCW Cardiovascular Center Study Section
2019 Co-Chair, Annual Retreat Programming Committee, Cardiovascular Center, Medical College of Wisconsin

NATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

2017 - 2018 Co-Chair, AUA/IARS Scholars Day Programming Committee, early-Stage Anesthesia Scholars
2017 - 2019 Trainee Chair, Translational Physiology Interest Group, American Physiological Society
2017 - 2019 Member, Experimental Circulation, American Society of Anesthesiology
2018 - 2020 member, CV Section Communications Committee, American Physiological Society
2018 - Present member, FAER Development Committee
2019 - Present member, MCS Clinician-Scientist Translational Research (CSTR) Subcommittee, Microcirculatory Society
2019 - Present Member, Career Development Award, Vascular Sciences Study Section, American Heart Association
2019 member, IMPACT Clinical Trials Study Section, International Anesthesia Research Society (IARS)
2020 - 2023 Chair, Communications Committee, CV Section, American Physiological Society
2020 - 2023 Nominating Chair, Translational Physiology Interest Group, American Physiological Society
2020 - 2023 member, Steering Committee, American Physiological Society, CV Section
2020 - Present Early-Career Reviewer, Vascular Molecular and Cell Biology (VCMB) Study Section, National Institutes of Health
2021 - Present Chartered member, Therapeutic Developments and Preclinical Studies, National Institutes of Health
2021 - Present Member, AUA Strategic Programming Committee, Association of University Anesthesiologists

INTERNATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

2017 - Present member, International Anesthesia Research Society External Scientific Advisory Board
2018 - Present member, IARS Program Committee
2018 - 2020 Co-President, early Stage Anesthesia Scholars (eSAS)
2020 - Present member, Annual Meeting Oversight Committee, International Anesthesia Research Society (IARS)

RESEARCH GRANTS/AWARDS/CONTRACTS/PROJECTS:

Active

Peer Review

Title:	Novel Role of Sphingolipids in Maintaining Vascular Homeostasis
Source:	NIH/NHLBI K08
Role & Effort:	PI
PI:	Julie K. Freed
Dates:	2018 - 2023
Direct Funds:	\$693,475

Title: Prehabilitation of Frail Surgical Cancer Patients using Remote Ischemic Preconditioning
Source: NIH/NIA R21
Role & Effort: Co-PI
PI: Freed, Durand
Dates: 2019 - 2021
Direct Funds: \$275,000

Title: Bridging the Gap in Translational Vascular Research
Source: Advancing a Healthier Wisconsin (AHW)
Role & Effort: PI
Dates: 05/01/2021 - 04/30/2023
Direct Funds: \$250,000

Pending

Peer Review

Title: Mechanism of Anticancer Therapy Mediated Impairment of Human Microvascular Function
Source: NIH/NHLBI R01
Role & Effort: Co-I
PI: Andreas Beyer
Dates: 2020 - Present
Direct Funds: \$1,852,755

Title: Critical role of Mitochondrial Fission/Fusion in Regulation of Microvascular Endothelial Function
Source: NHLBI
Role & Effort: Co-Investigator
PI: David D. Gutterman MD
Dates: 2021 - Present
Direct Funds: \$1,720,440

Title: Specialized Training in Anesthesiology Team Science (STAT)
Source: NIGMS
Role & Effort: co-PI
Dates: 01/01/2022 - 12/30/2026
Direct Funds: \$1,168,305

Title: Dual Functionality of Ceramide in Human Microvascular Endothelial Function
Source: NHLBI
Role & Effort: PI
Dates: 01/01/2022 - 12/30/2026
Direct Funds: \$1,531,034

Prior

Peer Review

Title: Novel Role of Sphingolipids in

Source:	Maintaining Vascular Homeostasis Foundation for Anesthesia Education and Research
Role & Effort:	PI
PI:	Julie K. Freed
Dates:	01/01/2018 - 01/01/2019
Direct Funds:	\$175,000
Title:	Novel Role of Sphingolipids in Maintaining Vascular Homeostasis
Source:	Clinical & Translational Research Institute KL2
Role & Effort:	PI
PI:	Julie K. Freed
Dates:	07/2018 - Present
Direct Funds:	\$275,000 (Declined funding due to being awarded NIH K08)
Title:	Use of Cobalamins Treatment of Sepsis- Induced Vasoplegia
Source:	Advancing a Healthier Wisconsin (AHW) & The Steve Cullen Endowment
Role & Effort:	PI
PI:	Julie K. Freed
Dates:	07/2018 - 06/2019
Direct Funds:	\$50,000
Title:	Percutaneous Distal Embolic Protection (PDEP) for LVAD Thrombolysis
Source:	We Care Fund for Medical Innovation and Research
Role & Effort:	Co-I
PI:	David Joyce
Dates:	2018 - 2020
Direct Funds:	\$150,000
Title:	A Phase II Double Blind Randomized Controlled Trial of High Dose Vitamin B12 in Septic Shock.
Source:	ASPEN Rhoads Research Foundation
Role & Effort:	Co-I
PI:	Jayshil Patel
Dates:	05/2019 - 04/2020
Direct Funds:	\$50,000

INVITED LECTURES/WORKSHOPS/PRESENTATIONS:

International

Moderator, Expanding Our Horizons in Anesthesiology Research Training, International Anesthesia Research Society Annual Meeting, Washington D.C., 2017

The "I" in "Team": Interdisciplinary Thinking for Whole-Patient Perioperative Care, International Anesthesia Research Society Annual Meeting, Chicago, IL, 2018

Resilience Personified: Transitioning from Trainee to Junior Faculty and Beyond, International Anesthesia Research Society Annual Meeting, Chicago, IL, 2018

Moderator, Priorities for Developing Researchers: Perspectives from the NIH and IARS, International Anesthesia Research Society Annual Meeting, Chicago, IL, 2018

National

- Session Chair, Extracellular Vesicles and Cardiovascular Disease: Good Things Come in Small Packages?, American Heart Association Scientific Sessions, Orlando, FL, 2015
- Moderator, Experimental Circulation: Cardiac Dysfunction, American Society of Anesthesiology Annual Meeting, San Diego, CA, 2015
- Session Chair, Emerging Concepts in the Local Regulation of Blood Flow, Experimental Biology Annual Meeting, Chicago, IL, 2017
- Endothelial Dilator Mechanisms in Health and Disease, Experimental Biology Annual Meeting, Chicago, IL, 2017
- Young Investigator Basic Science Oral Presentations, Moderator, American Society of Anesthesiology Annual Meeting, Virtual, - 2020
- Coronary, Cerebral, and Peripheral Microcirculatory Contribution to Disease, Poster Professor, AHA Scientific Sessions Annual Meeting, Virtual, - 11/2020
- The Translational Tale of Hydroxocobalamin for Treatment of Microvascular Injury, Speaker, Experimental Biology Annual Meeting, Virtual, - 04/29/2021
- Sweat the Small Stuff: Sphingolipids and Cardiovascular Disease, Moderator, Experimental Biology Annual Meeting, Virtual, - 04/30/2021
- Human Microvascular Function in Health and Disease: Tales of Translation, Visiting Professor, Dept of Anesthesiology, Stanford University, - 05/24/2021
- Translational Tales of Microvascular Function, Visiting Professor, Grand Rounds, Department of Anesthesiology, Washington University, St. Louis MO, - 12/11/2019
- Early-Stage Scholars and the Future of Anesthesiology, American Society of Anesthesiology Annual Meeting, Orlando, FL, - 10/20/2019
- Microvascular Function Along the Translational Spectrum, Visiting Professor, Grand Rounds, Department of Anesthesiology, Mayo Clinic, Rochester, MN, - 09/30/2019
- The Role of Sphingolipids in Endothelial Dilator Mechanisms, Research Seminar, Department of Anesthesiology, Washington University, St. Louis, MO, - 12/10/2019
- Tales of Translation: Human Microvascular Function and Disease, Visiting Professor, Dept of Anesthesiology, Dartmouth University, - 2021
- A Tale of Two Studies: Flow-Induced Dilation and Vasoplegia in the Human Microcirculation, Visiting Professor, Yale University, New Haven, CT, - 09/06/2018
- A Tale of Two Studies: Flow-Induced Dilation and Vasoplegia in the Human Microcirculation, University of Maryland, Shock Trauma Center, Baltimore, MD, - 05/24/2018
- Research During Residency: Being Both Clinically Competent and Productive in Research, American Society of Anesthesiology Annual Meeting, Orlando, FL, - 10/20/2019

Regional

- Julie K. Freed, From the Lab to the Clinic: How Research Breakthroughs Translate to Better Patient Care, Northeast Technical College Science Day, Green Bay, WI, 03/13/2018

Local

- Say Yes to NO? Intraoperative Use of Inhaled Nitric Oxide, Anesthesia Education Conference, Milwaukee, WI, 2015
- From the OR to the Bench and then to the Bedside: Translation of Human Microvascular Function, Department of Medicine Grand Rounds, Medical College of Wisconsin, Milwaukee, WI, - 10/04/2019
- From the Bench to the Bedside and Back Again: Developing a Translational Research Project, Molecular and Cellular Pathway Course, Medical College of Wisconsin, Milwaukee, WI, - 01/17/2019
- From the OR to the Bench and then to the Bedside: Translation of Human Microvascular Function, Grand Rounds, Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, WI, - 04/17/2020
- Bench to Bedside and Back Again: Translation of Human Microvascular Function, Grand Rounds, Department of Medicine, Medical College of Wisconsin, Milwaukee, WI, - 10/04/2019
- From the Bench to the Bedside and Back Again: Developing a Translational Research Project, Molecular and Cellular Pathway Lecture, Medical College of Wisconsin, Milwaukee, WI, - 01/17/2020
- Sweat the Small Stuff: The Role of Sphingolipids in Microvascular Function, Seminar Series, Department of Physiology, Medical College of Wisconsin, Milwaukee, WI, - 03/11/2020
- Negotiating With Your Chair, Clinical Scholars Lecture Series, Medical College of Wisconsin, Milwaukee, WI, - 04/28/2020

Hydroxocobalamin for Treatment of Vasoplegia, MCW Division of Geriatrics/Gerontology Research Seminar, - 12/07/2018

COMMITTEE SERVICE:

Medical College of Wisconsin

2014 - 2017 Member, Program Evaluation Committee, Anesthesiology, Medical College of Wisconsin
2015 Member, Surgical Residency Review Committee, Department of Surgery, Medical College of Wisconsin
06/01/2017 - 09/30/2017 Member, Cardiovascular Center Blue Ribbon Committee, Medical College of Wisconsin
2019 - Present Chair, Academic Time Committee, Anesthesiology, Medical College of Wisconsin

Hospital

07/01/2017 - Present Member, Anesthesia Equipment Committee, Anesthesiology, Froedtert Hospital

MCW TEACHING ACTIVITIES:

Medical Student Education

2012 - 2015 Instructor, M3 Airway and IV Workshop
2013 M3 Acid-Base Physiology Lecturer
07/01/2017 - Present M3 Problem Based Learning Discussion Facilitator
07/01/2017 - 2019 Molecular and Cellular Research Pathway Small Group Facilitator
2019 - Present Clinical and Translational Research Pathway Instructor

Resident and Fellow Education

07/01/2015 - 06/30/2019 Director, Resident Journal Club

EXTRAMURAL TEACHING:

Resident and Fellow Education

2018 - Present Medical College of Wisconsin, Milwaukee, WI, Annual Lecture on Statistics for the Physician
2019 - Present Medical College of Wisconsin, Milwaukee, WI, Annual CA-1 Lecture on Induction Drugs

MCW STUDENTS, FACULTY, RESIDENTS AND CLINICAL/RESEARCH FELLOWS MENTORED:

Medical Students

06/01/2016 - 08/20/2016 Samantha Petersen, FAER Research Mentor, Medical College of Wisconsin
02/01/2017 - Present Kelsey Walters, Medical Student Summer Research Program Mentor, Medical College of Wisconsin
2018 - Present Ross Whitlock, MCR Pathway Advisor, Medical College of Wisconsin
2018 - Present Rhett Nance, Clinical Advisor, Medical College of Wisconsin
2018 - Present Sarah Meeuwssen, Research Pathway Mentor, Medical College of Wisconsin
2018 - Present Forrest Stehula, Research Pathway Mentor, Medical College of Wisconsin
2019 - Present Matthew Mahoney, Clinical Advisor, Medical College of Wisconsin
2021 - Present Christian Wright, Clinical Advisor, Medical College of Wisconsin

Graduate Students

PhD

2020 - Present Gopika SenthilKumnar, MSTP Program, Medical College of Wisconsin

Postdoctoral Researchers

2019 - Present Boran Katunarc, Primary Mentor, Medical College of Wisconsin

Clinical/Research Fellows

2019 - Present Kate Cohen, Co-Mentor, Medical College of Wisconsin

Residents

2017 - Present Julie Harvey, Clinical, Medical College of Wisconsin

2018 - Present Steven Kapeles, Clinical Mentor, Medical College of Wisconsin

EXTRAMURAL STUDENTS, FACULTY, RESIDENTS, AND CLINICAL/RESEARCH FELLOWS MENTORED:

Medical Students

2020 - Present, FAER Medical Student Anesthesia Research Fellowship, Foundation for Anesthesia Education and Research (FAER)

PROGRAMMATIC DEVELOPMENTS:

Research Programs

2018 - Present Development of Clinical Research Division, Department of Anesthesiology

PROFESSIONAL DEVELOPMENT:

01/23/2020 Trained with the Center for the Improvement of Mentored Experiences in Research (CIMER).

The goal of this workshop is to enhance the mentoring skills of principal investigators to foster more inclusive and effective relationships with mentees.

01/2020 - 05/2020 Responsible Conduct of Research Course, Spring Semester, Medical College of Wisconsin. This course required an online component as well as nine 1.5 hour face-to-face classes taught by faculty of the Center for Bioethics and Medical Humanities.

BIBLIOGRAPHY

Refereed Journal Publications/Original Papers

1. **Freed JK**, Smith JR, Li P, Greene AS. Isolation of signal transduction complexes using biotin and crosslinking methodologies. *Proteomics*. 2007 Jul;7(14):2371-4.
2. **Freed JK**, Greene AS. Proteomic analysis of shear stress-mediated protection from TNF-alpha in endothelial cells. *Microcirculation*. 2010 May;17(4):259-70. PMID: PMC3712086
3. Pagel PS, Dye L 3rd, Boettcher BT, **Freed JK**. Advanced Age Attenuates Left Ventricular Filling Efficiency Quantified Using Vortex Formation Time: A Study of Octogenarians With Normal Left Ventricular Systolic Function Undergoing Coronary Artery Surgery. *J Cardiothorac Vasc Anesth*. 2018 Aug;32(4):1775-1779.
4. **Freed JK**, Shortreed MR, Kleefisch CJ, Smith LM, Greene AS. Revealing the role of phosphatidylserine in shear stress-mediated protection in endothelial cells. *Endothelium*. 2008;15(4):225-30. PMID: PMC2579788
5. Dye L 3rd, **Freed JK**, Leschke JR, Pagel PS. A Rare Cause of Intermittent Dyspnea, Occasional Palpitations, and Atypical Chest Discomfort. *J Cardiothorac Vasc Anesth*. 2018 Aug;32(4):2031-2033.
6. **Freed JK**, Beyer AM, LoGiudice JA, Hockenberry JC, Gutterman DD. Ceramide changes the mediator of flow-induced vasodilation from nitric oxide to hydrogen peroxide in the human microcirculation. *Circ Res*. 2014 Aug 15;115(5):525-32. PMID: PMC4640193
7. **Freed JK**, Simon JA, Iqbal Z, Almassi GH, Pagel PS. An Unusual Cause of an Isolated Transient Ischemic Attack in an Otherwise Healthy Elderly Man. *J Cardiothorac Vasc Anesth*. 2018 Jun;32(3):1529-1532.
8. Zundel MT, Feih JT, Rinka JRG, Boettcher BT, **Freed JK**, Kaiser M, Ghadiali HY, Tawil JN, Woehlck HJ, Pagel PS. Hydroxocobalamin With or Without Methylene Blue May Improve Fluid Balance in Critically Ill Patients With Vasoplegic Syndrome After Cardiac Surgery: A Report of Two Cases. *J Cardiothorac Vasc Anesth*. 2018 Feb;32(1):452-457.
9. Beyer AM, **Freed JK**, Durand MJ, Riedel M, Ait-Aissa K, Green P, Hockenberry JC, Morgan RG, Donato AJ, Peleg R, Gasparri M, Rokkas CK, Santos JH, Priel E, Gutterman DD. Critical Role for Telomerase in the Mechanism of Flow-Mediated Dilatation in the Human Microcirculation. *Circ Res*. 2016 Mar

- 04;118(5):856-66. PMID: PMC4772813
10. **Freed JK**, Dyer AJ, Olund TJ, Veldheer DJ, Boettcher BT, Pagel PS. An Unusual Finding in a Woman Undergoing Resection of a Large Anterior Mediastinal Mass. *J Cardiothorac Vasc Anesth*. 2018 Apr;32(2):1090-1092.
 11. Gutterman DD, Chabowski DS, Kadlec AO, Durand MJ, **Freed JK**, Ait-Aissa K, Beyer AM. The Human Microcirculation: Regulation of Flow and Beyond. *Circ Res*. 2016 Jan 08;118(1):157-72. PMID: PMC4742348
 12. Khatib D, Boettcher BT, **Freed JK**, Pagel PS. Acute, Severe Pulmonary Arterial Hypertension During Off-Pump Coronary Artery Surgery: Is New Myocardial Ischemia, Cardiac Repositioning, or External Mitral Valve Compression the Culprit? *J Cardiothorac Vasc Anesth*. 2016 Dec;30(6):1744-1747.
 13. Pagel PS, Boettcher BT, De Vry DJ, **Freed JK**, Iqbal Z. Moderate Aortic Valvular Insufficiency Invalidates Vortex Formation Time as an Index of Left Ventricular Filling Efficiency in Patients With Severe Degenerative Calcific Aortic Stenosis Undergoing Aortic Valve Replacement. *J Cardiothorac Vasc Anesth*. 2016 Oct;30(5):1260-5.
 14. Pagel PS, Sethi P, **Freed JK**, Boettcher BT, Hossein Almassi G. A Rare Complication of Cardiopulmonary Resuscitation After Mitral Valve Replacement. *J Cardiothorac Vasc Anesth*. 2017 Apr;31(2):770-772.
 15. Arain SR, **Freed JK**, Novalija J, Pagel PS, Ebert TJ. Short-Term Angiotensin Subtype 1 Receptor Blockade Does Not Alter the Circulatory Responses to Sympathetic Nervous System Modulation in Healthy Volunteers Before and During Sevoflurane Anesthesia: Results of a Pilot Study. *J Cardiothorac Vasc Anesth*. 2016 Dec;30(6):1479-1484.
 16. Boettcher BT, Woehlk HJ, Reck SE, Hong JC, Zimmerman MA, Kim J, Zundel MT, **Freed JK**, Pagel PS. Treatment of Vasoplegic Syndrome With Intravenous Hydroxocobalamin During Liver Transplantation. *J Cardiothorac Vasc Anesth*. 2017 Aug;31(4):1381-1384.
 17. Pagel PS, Davidovich RM, Steck DT, **Freed JK**, Boettcher BT. A Rare Complication of Metastatic Osteosarcoma. *J Cardiothorac Vasc Anesth*. 2017 Aug;31(4):1540-1541.
 18. **Freed JK**, Durand MJ, Hoffmann BR, Densmore JC, Greene AS, Gutterman DD. Mitochondria-regulated formation of endothelium-derived extracellular vesicles shifts the mediator of flow-induced vasodilation. *Am J Physiol Heart Circ Physiol*. 2017 May 01;312(5):H1096-H1104. PMID: PMC5451582
 19. Ebert TJ, Novalija J, Barney JA, Uhrich TD, Arain SR, **Freed JK**, Pagel PS. Moderate, Short-Term, Local Hyperglycemia Attenuates Forearm Endothelium-Dependent Vasodilation After Transient Ischemia-Reperfusion in Human Volunteers. *J Cardiothorac Vasc Anesth*. 2017 Oct;31(5):1649-1655.
 20. Kadlec AO, Chabowski DS, Ait-Aissa K, Hockenberry JC, Otterson MF, Durand MJ, **Freed JK**, Beyer AM, Gutterman DD. PGC-1? (Peroxisome Proliferator-Activated Receptor ? Coactivator 1-?) Overexpression in Coronary Artery Disease Recruits NO and Hydrogen Peroxide During Flow-Mediated Dilatation and Protects Against Increased Intraluminal Pressure. *Hypertension*. 2017 Jul;70(1):166-173. PMID: PMC5485836
 21. Boettcher BT, Mungara C, Manupipatpong KK, **Freed JK**, Kaiser M, Pagel PS. An Unexpected Finding During Repair of An Ascending Aortic Aneurysm. *J Cardiothorac Vasc Anesth*. 2018 Feb;32(1):600-602.
 22. **Freed JK**, Gutterman DD. Communication Is Key: Mechanisms of Intercellular Signaling in Vasodilation. *J Cardiovasc Pharmacol*. 2017 May;69(5):264-272. PMID: PMC5424612
 23. Patel JJ, Venegas-Borsellino C, Willoughby R, **Freed JK**. High-Dose Vitamin B12 in Vasodilatory Shock: A Narrative Review. *Nutr Clin Pract*. 2019 Aug;34(4):514-520.
 24. **Freed JK**, Simon JA, Iqbal Z, Almassi GH, Pagel PS. An Unusual Cause of an Isolated Transient Ischemic Attack in an Otherwise Healthy Elderly Man. *J Cardiothorac Vasc Anesth*. 32(2018)1529–1532.
 25. **Freed JK** and Durand MJ. You Are Only as Frail as Your Arteries: Prehabilitation of Elderly Surgical Patients. *Curr Anes Reports* 2019 Nov 9;(4):380-386.
 26. **Freed JK**, Dyer AJ, Olund TJ, Veldheer DG, Boettcher BT, Pagel PS. An Unusual Finding in a Woman Undergoing Resection of a Large Anterior Mediastinal Mass. *J Cardiothorac Vasc Anesth*. 32(2018)1090–1092.
 27. Pagel PS, Dye L, Boettcher BT, **Freed JK**. Advanced Age Attenuates Left Ventricular Filling Efficiency Quantified Using Vortex Formation Time: A Study of Octogenarians With Normal Left Ventricular Systolic Function Undergoing Coronary Artery Surgery. *J Cardiothorac Vasc Anesth*. 32(2018)1775–1779.
 28. Dye L, **Freed JK**, Leschke JR, Pagel PS. A Rare Cause of Intermittent Dyspnea, Occasional Palpitations, and

- Atypical Chest Discomfort. *J Cardiothorac Vasc Anesth.* 32(2018)2031–2033.
29. Pagel PS, Dye L 3rd, Hill GED, Vega JL, Tawil JN, De Vry DJ, Chandrashekarappa K, Iqbal Z, Boettcher BT, **Freed JK**. Noninvasive Determination of Vortex Formation Time Using Transesophageal Echocardiography During Cardiac Surgery. *J Vis Exp.* 2018 Nov 28(141).
 30. Patel JJ, Venegas-Borsellino C, Willoughby R, **Freed JK**. High-Dose Vitamin B12 in Vasodilatory Shock: A Narrative Review. *Nutr Clin Pract.* 2019 Aug;34(4):514-520.
 31. Pagel PS, **Freed JK**, Lien CA. Gender Differences in Authorship in the Journal of Cardiothoracic and Vascular Anesthesia: A 28-Year Analysis of Publications Originating From the United States, 1990-2017. *J Cardiothorac Vasc Anesth.* 2019 Mar;33(3):593-599.
 32. Pagel PS, **Freed JK**, Lien CA. A 50-year analysis of gender differences in United States authorship of original research articles in two major anesthesiology journals *Scientometrics.* 2019.
 33. Pagel PS, **Freed JK**, Lien CA. Gender Composition and Trends of Journal of Cardiothoracic and Vascular Anesthesia Editorial Board Membership: A 33-Year Analysis, 1987-2019. *J Cardiothorac Vasc Anesth.* 2019 Dec;33(12):3229-3234.
 34. Pagel PS, **Freed JK**, Lien CA. Gender Composition and Trends of Journal of Cardiothoracic and Vascular Anesthesia Editorial Board Membership: A 33-Year Analysis, 1987-2019. *J Cardiothorac Vasc Anesth.* 2019 Jul 25.
 35. Pagel PS, Lazicki TJ, Izquierdo DA, Boettcher BT, Tawil JN, **Freed JK**. Characteristics associated with Publication of Randomized Controlled Trials in the Journal of Cardiothoracic and Vascular Anesthesia: A 15-Year Analysis, 2004-2018. *J Cardiothorac Vasc Anesth.* 2020 Apr;34(4):857-864.
 36. Pagel PS, Tawil JN, **Freed JK**. Cobalt Blues: A New Complication of Hydroxocobalamin Therapy for Vasopressor-Resistant Vasoplegia in Patients Treated With Chronic Renal Replacement Therapy? *J Cardiothorac Vasc Anesth.* 2019 Dec;33(12):3406-3408.
 37. Schulz ME, Katunaric B, Hockenberry JC, Gutterman DD, **Freed JK**. Manipulation of the Sphingolipid Rheostat Influences the Mediator of Flow-Induced Dilation in the Human Microvasculature. *J Am Heart Assoc.* 2019 Sep 03;8(17):e013153. PMID: PMC6755855
 38. Hader SN, Zinkevich N, Norwood Toro LE, Kriegel AJ, Kong A, **Freed JK**, Gutterman DD, Beyer AM. Detrimental effects of chemotherapy on human coronary microvascular function. *Am J Physiol Heart Circ Physiol.* 2019 Oct 01;317(4):H705-H710. PMID: PMC6843017
 39. Chabowski DS, Cohen KE, Abu-Hatoum O, Gutterman DD, and **Freed JK**. Crossing Signals: Bioactive Lipids in the Microvasculature. *Am J Physiol Heart Circ Physiol.* 2020 April 27;318(5):H1185-H1197. PMID: 32243770

Books, Chapters, and Reviews

1. Pagel PS, **Freed JK**: Endocardial Cushion Defects, *Essence of Anesthesia Practice*, 4th Edition. Edited by Fleisher LA and Roizen MF, Philadelphia, Elsevier/Sanders, 2017.
2. Pagel PS, **Freed JK**: Cardiac Physiology, *Kaplan's Cardiac Anesthesia for Cardiac and Noncardiac Surgery*, 7th Edition. Edited by Kaplan JA, Augoustides JGT, Manecke GR, Maus TM, Reich DA, Philadelphia, Elsevier Churchill Livingstone, 2017, pp. 143-78.
3. Pagel PS, **Freed JK**: Cardiovascular Physiology, pharmacology, molecular biology, and genetics, *Kaplan's Essential Cardiac Anesthesia*, 2nd edition, Edited by Kaplan JA, Philadelphia, Elsevier Churchill Livingstone, 2016.
4. **Freed JK**, Tawil JN, Popescu WM, and Pagel PS. *Heart Failure and Cardiomyopathies, Stoelting's Anesthesia and Co-Existing Disease*, 8th Edition. Edited by Hines RL and Marschall K. Philadelphia, Elsevier Churchill Livingstone, 2020. (in press)
5. Pagel PS, Tawil JN, Boettcher BT, **Freed JK**: Cardiovascular pharmacology, *Clinical Anesthesia Fundamentals*, 2nd edition. Edited by Barash PG, Cullen BF, Cahalan MK, Stock MC, Sharar SR, Ortega R, Philadelphia, Wolters Kluwer Health, 2020. (In Press)
6. **Freed JK**: Appendix D: COVID-19 Considerations, 4th edition. Edited by Ehrenfeld JM and Urman RD, Philadelphia, Wolters Klumer Health, 2020. (In Press)
7. Durand MJ, Beckert AK, Peterson CY, Ludwig KA, Ridolfi TJ, Lauer KK, **Freed JK**. You Are Only as Frail as Your Arteries: Prehabilitation of Elderly Surgical Patients *Current Anesthesiology Reports.* 1 December 2019;9(4):380-386.
8. Pagel PS, **Freed JK**. Cardiac Physiology *Kaplan's Essentials of Cardiac Anesthesia for Cardiac Surgery.* 6 December 2017:62-79.
9. **Freed JK**, Durand MJ. There is no way to sugar coat it, you are getting older. *Am J Physiol Heart Circ*

- Physiol. 2018 Sep 01;315(3):H632-H633.
10. Chabowski DS, Cohen KE, Abu-Hatoum O, Gutterman DD, and **Freed JK**. Crossing Signals: Bioactive Lipids in the Microvasculature. *AJP Heart*. 318(5):H1185-H1197.
 11. Katunatic B, Cohen KE, Beyer AM, Gutterman DD, **Freed JK**. Sweat the small stuff: The human microvasculature and heart disease. *Microcirculation*. 2021 Apr;28(3):e12658. PMID: PMC7960576
 12. Pagel PS, Tawil JN, Boettcher BT, Izquierdo DA, Lazicki TJ, Crystal GJ, **Freed JK**. Heart Failure With Preserved Ejection Fraction: A Comprehensive Review and Update of Diagnosis, Pathophysiology, Treatment, and Perioperative Implications. *J Cardiothorac Vasc Anesth*. 2021 Jun;35(6):1839-1859.
 13. Chabowski DS, Cohen KE, Abu-Hatoum O, Gutterman DD, **Freed JK**. Crossing signals: bioactive lipids in the microvasculature. *Am J Physiol Heart Circ Physiol*. 2020 May 01;318(5):H1185-H1197. PMID: PMC7541955
 14. SenthilKumar G, Katunatic B, Bordas-Murphy H, Young M, Doren EL, Schulz ME, Widlansky ME, **Freed JK**. 17 β -Estradiol promotes sex-specific dysfunction in isolated human arterioles. *Am J Physiol Heart Circ Physiol*. 2023 Mar 01;324(3):H330-H337. PMID: PMC9925162
 15. SenthilKumar G, Gutierrez-Huerta CA, **Freed JK**, Beyer AM, Fancher IS, LeBlanc AJ. New developments in translational microcirculatory research. *Am J Physiol Heart Circ Physiol*. 2022 Dec 01;323(6):H1167-H1175. PMID: PMC9678417
 16. Patel JJ, Willoughby R, Peterson J, Carver T, Zelten J, Markiewicz A, Spiegelhoff K, Hipp LA, Canales B, Szabo A, Heyland DK, Stoppe C, Zielonka J, **Freed JK**. High-Dose IV Hydroxocobalamin (Vitamin B12) in Septic Shock: A Double-Blind, Allocation-Concealed, Placebo-Controlled Single-Center Pilot Randomized Controlled Trial (The Intravenous Hydroxocobalamin in Septic Shock Trial). *Chest*. 2023 Feb;163(2):303-312.
 17. Katunatic B, SenthilKumar G, Schulz ME, De Oliveira N, **Freed JK**. S1P (Sphingosine-1-Phosphate)-Induced Vasodilation in Human Resistance Arterioles During Health and Disease. *Hypertension*. 2022 Oct;79(10):2250-2261. PMID: PMC9473289
 18. Boettcher BT, Woelck HJ, Makker H, Pagel PS, **Freed JK**. Hydroxocobalamin for treatment of catecholamine-resistant vasoplegia during liver transplantation: A single-center series of 20 cases. *Int J Surg Case Rep*. 2022 Sep;98:107488. PMID: PMC9399471
 19. Cohen KE, Katunatic B, Schulz ME, SenthilKumar G, Young MS, Mace JE, **Freed JK**. Role of Adiponectin Receptor 1 in Promoting Nitric Oxide-Mediated Flow-Induced Dilatation in the Human Microvasculature. *Front Pharmacol*. 2022;13:875900. PMID: PMC9014203
 20. Joyce DL, Lynch BE, Freed J, Kreuziger LB, Salinger MH, Joyce LD. Catheter-based system for the treatment of left ventricular assist device thrombosis. *Artif Organs*. 2022 Apr;46(4):705-709.
 21. Cohen KE, Katunatic B, SenthilKumar G, McIntosh JJ, **Freed JK**. Vascular endothelial adiponectin signaling across the life span. *Am J Physiol Heart Circ Physiol*. 2022 Jan 01;322(1):H57-H65. PMID: PMC8698498
 22. Gaulton TG, Neuman MD, US intubateCOVID Investigators. Trends in personal protective equipment use by clinicians performing airway procedures for patients with coronavirus disease 2019 in the USA from the intubateCOVID registry. *Br J Anaesth*. 2021 May;126(5):e184-e186. PMID: PMC8052559
 23. SenthilKumar G, Katunatic B, Zirgibel Z, Lindemer B, Jaramillo-Torres MJ, Bordas-Murphy H, Schulz ME, Pearson PJ, **Freed JK**. Necessary Role of Ceramides in the Human Microvascular Endothelium During Health and Disease. *Circ Res*. 2024 Jan 05;134(1):81-96. PMID: PMC10766100
 24. SenthilKumar G, Mathieu NM, **Freed JK**, Sigmund CD, Gutterman DD. Addressing the decline in graduate students' mental well-being. *Am J Physiol Heart Circ Physiol*. 2023 Oct 01;325(4):H882-H887.
 25. SenthilKumar G, Katunatic B, Bordas-Murphy H, Sarvaideo J, **Freed JK**. Estrogen and the Vascular Endothelium: The Unanswered Questions. *Endocrinology*. 2023 Apr 17;164(6). PMID: PMC10230790

Editorials, Letters To Editor, Other

1. **Freed JK**, Gutterman DD. Mitochondrial reactive oxygen species and vascular function: less is more. *Arterioscler Thromb Vasc Biol*. 2013 Apr;33(4):673-5.
2. **Freed JK**. Healing the Broken Heart With Adrenomedullin. *Circ Res*. 2019 Jan 04;124(1):15-17.
3. **Freed JK** and Durand MJ. There is No Way to Sugar Coat It: You Are Getting Older. *Am J Physiol Heart Circ Physiol*. 2018 Sep 1;315(3):H632-H633.

Abstracts

1. Freed (Antczak) JK, and Greene AS. Investigation of Apoptotic Pathways in Vascular Endothelial Cells

- through Functional Proteomics and Mass Spectrometry. FASEB, 2005. Poster Presentation.
2. **Freed JK** (Antczak) and Greene AS. Proteomic Analysis of Shear Stress Protection Mechanisms in Endothelial Cells. FASEB J, 20:A1298, 2006. Poster Presentation
 3. **Freed JK**, Smith JR, Li P, Greene AS. MS Analysis of the TNF-alpha Signaling Complex Using a Novel Signaling Complex Isolation Approach. JASMS, 2006. Poster Presentation.
 4. **Freed JK**, and Greene AS. Functional Proteomic Analysis of Shear Stress Protection Mechanisms Using a Novel Signaling Complex Isolation Approach. FASEB J. 2007;21 A859.
 5. **Freed JK**, Shortreed MR, Kleefisch CJ, Smith LM, Greene AS. Isolation and Relative Quantification of Phosphatidylserine from Vascular Endothelial Cells. JASMS, 2007. Poster Presentation.
 6. **Freed JK**, Beyer AM and Gutterman DD. Transition in Mechanism of Flow-Mediated Dilation During Stress in Humans: Role of Ceramide. Circulation. 2012;126: A13659. Oral Presentation.
 7. **Freed JK**, Beyer AM, and Gutterman DD. Inhibition of Neutral Sphingomyelinase Prevents High Pressure-Induced Shift in the Mediator of Endothelium-Dependent Dilation from NO to H2O2 FASEB J. 2013;27:901.1. Poster Presentation.
 8. **Freed JK**, Durand MJ, Kaul S, Densmore JC, and Gutterman DD. Ceramide-Induced Microparticles Alter the Mechanism of Flow-Mediated Dilation. Circulation. 2013;128: A11407. Poster Presentation.
 9. **Freed JK**, Hockenberry JC, Kaul S, Densmore JC and Gutterman DD. Endothelial Microparticles Alter the Mediator of Flow-Induced Dilation. American Society of Anesthesiology Annual Meeting, New Orleans, LA. 2014. Oral Presentation.
 10. **Freed JK**, Hockenberry JC, and Gutterman DD. Manipulation of the Sphingolipid Rheostat Alters the Mediator of Flow-Induced Dilation in the Human Microcirculation. Circulation. 2014; 130:A16304. Oral Presentation.
 11. Durand MJ, **Freed JK**, Hockenberry JC, and Gutterman DD. The DRP-1 Inhibitor Mdivi-1 Prevents Compensatory Mitochondrial H2O2-Mediated Vasodilation Induced by Ceramide Treatment in Human Adipose Arterioles. APS Physiological Bioenergetics Conference, Tampa, FL. 2015.
 12. **Freed JK**, Hockenberry JC, and Gutterman DD. Sphingosine-1-Phosphate Reverts the Mechanism of Flow-Induced Dilation to Nitric Oxide in Diseased Human Arterioles. Circulation. 2015;132:A12272. Poster Presentation.
 13. **Freed JK**, Hockenberry JC, and Gutterman DD. Mas Receptor Inhibition Restores Phenylephrine Response in Human Arterioles Exposed to Propofol During Angiotensin Axis Blockade. American Society of Anesthesiology Annual Meeting, San Diego, CA. 2015. Poster Presentation.
 14. Boettcher BT, De Vry DJ, **Freed JK**, Pagel PS. Moderate Aortic Valvular Insufficiency Falsely Elevates Vortex Formation Time in Patients with Calcific Degenerative Aortic Stenosis Undergoing Aortic Valve Replacement. Society of Cardiac Anesthesia Annual Meeting, San Diego, CA. 2016. Poster Presentation.
 15. **Freed JK**, Durand MJ, Hoffmann BR, Densmore JC, Greene AS, and Gutterman DD. Contribution of Mitochondrial Oxidative Stress in the Formation of Endothelial-Derived Microvesicles. Association of University Anesthesiologists & International Anesthesiology and Research Society Annual Meetings, San Francisco, CA. 2016. Poster Presentation.
 16. Peterson SE, Hockenberry JC, and **Freed JK**. Investigation of the Vasoconstrictor Response in Human Arterioles Exposed to Captopril and Propofol. American Society of Anesthesiology Annual Meeting, Chicago, IL. 2016. FAER Poster Presentation.
 17. Khatib D, Steck DT, Choi C, **Freed JK**, Boettcher BT, and Pagel PS. Advanced Age Attenuates Left Ventricular Filling Efficiency Quantified Using Vortex Formation Time is Attenuated in Patients Undergoing Coronary Artery Bypass Surgery. Society of Cardiac Anesthesia Annual Meeting, Orlando, FL. 2017. Poster Presentation.
 18. **Freed JK**, Hockenberry JC, and Gutterman DD. Exogenous Adiponectin Restores Nitric Oxide-Dependent Flow-Induced Dilation in Human Atrial Arterioles. International Anesthesiology and Research Society Annual Meetings, Washington D.C. 2017. Poster Presentation.
 19. Walters K, Hockenberry JC, Boettcher BT, Woehlck HJ, Gutterman DD, and **Freed JK**. Unmasking the Magic of Hydroxocobalamin for Treatment of Vasoplegia: Effect of Vitamin B12 in Human Arterioles. MCW Research Day. Milwaukee, WI. 2017
 20. **Freed JK**, Schulz ME, Beyer AD, Hockenberry JC, and Gutterman DD. Manipulation of the Sphingolipid Pathway Determines the Mediator Released During Flow-Induced Dilation in the Human Microcirculation. PostGraduate Assembly in Anesthesiology Annual Meeting. New York, NY. 2017. Poster Presentation.

21. Gutterman DD, Zhang D, Beyer AB, Durand MC, Freed JF. Endothelium-dependent Vasodilation in the Human Microcirculation: A Switch in Mechanism with Disease or Stress. American Physiological Society Interface of Mathematical Models in Experimental Biology: Role of the Microvasculature. Scottsdale, AZ. 2019
22. Schulz ME, Gutterman DD, and **Freed JK**. Sphingolipids Influence the Mediator of Flow Induced Dilation: Role of Neutral Ceramidase. NHLBI K to R Annual Meeting. Bethesda, MD. July 2019. Poster Presentation
23. Katunatic B, Schulz ME, and **Freed JK**. Sphingosine-1-Phosphate Induced Vasodilation of Human Arterioles: Role of S1P Receptor 1. CVC Annual Retreat. October 2019. Milwaukee, WI. Poster Presentation
24. Schulz ME, Gutterman DD, and **Freed JK**. Activation of Neutral Sphingomyelinase Contributes to Nitric Oxide-Mediated Flow-Induced Dilation in the Human Microvasculature FASEB J. 2020.
25. Cohen KE, Schulz ME, Gutterman DD, and **Freed JK**. Role of AMPK in Adiponectin-Mediated Restoration of Nitric Oxide-Dependent Flow Induced Dilation in the Human Microvasculature. FASEB J 2020.
26. Katunatic B, Schulz ME, and **Freed JK**. Sphingosine-1-Phosphate Receptor 1 Mediated Vasodilation in Human Arterioles. FASEB J 2020.
27. Schulz ME, Gutterman DD, and **Freed JK**. Role of Neutral Sphingomyelinase in Maintaining Flow-Induced Dilation Following Acute Stress in the Human Microvasculature. AHA Vascular Discovery: From Genes to Medicine (formerly ATVB) May 2020. ePoster
28. Hader S, Norwood Toro LE, Didier D, McIntosh JK, **Freed JK**, Kong A, Gutterman DD, and Beyer AM. Trading One Disease for Another: A Longitudinal Study on the Effects of Anti-Cancer Therapies on the Human Microvasculature. AHA Vascular Discovery: From Genes to Medicine (formerly ATVB) May 2020. ePoster
29. Norwood-Toro LE, Hader S, Didier D, McIntosh JK, **Freed JK**, Kong A, and Beyer Am. Effects of Anti-Cancer Therapy on Human Microvascular Function: A Longitudinal Study. FASEB J 2020.
30. Cohen KE, Schulz ME, Gutterman DD, and **Freed JK**. Role of AMPK in Determining the Mediator of Flow-Induced Dilation in the Human Microvasculature. FASEB J. 2021.
31. Katunatic B, Stehula FJ, Schulz ME, Gutterman DD, and **Freed JK**. Human Microvascular Reactivity in vivo Using Incident Dark Field Videomicroscopy. MCW Virtual Graduate School and Post-Doctoral Education Office Research Day. *selected winner in post-doctoral fellow category
32. Katunatic B, Stehula FJ, Schulz ME, Gutterman DD, and **Freed JK**. Human Microvascular Reactivity in vivo Using Incident Dark Field Videomicroscopy. FASEB J. 2021.
33. Katunatic B, Schulz ME, and **Freed JK**. Investigation of S1P-induced Vasodilation in the Human Microvasculature. FASEB J. 2021.
34. Schulz ME, Katunatic B, Cohen KE, Gutterman DD, and **Freed JK**. Investigation of the Dual Functional Role of Ceramide in the Human Microcirculation. FASEB J. 2021.