

CURRICULUM VITAE

Jingyan Han, MSc, PhD

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EDUCATION

- 7/1997, BSc School of Pharmacy, Beijing Medical University (now Peking University School of Medicine)
- 7/2001, MSc Department of Pharmacology, Chinese Academy of Medical Science & Peking Union Medical College, Beijing, China.
- 9/2009, PhD Department of Pharmacology, University of Illinois at Chicago

EMPLOYMENT HISTORY

- 09/2001 – 05/2004 Research Assistant
Department of Biopharmaceutical Science, the University of Illinois at Chicago
- 05/2004 – 06/2009 Research Assistant
Department of Pharmacology, the University of Illinois at Chicago
- 09/2009 – 01/2012 Postdoctoral fellowship Mentor: Dr. Vladimir Maskant
Department of Pharmacology, School of Medicine, University of Pennsylvania
- 01/2012 – 06/2014 Postdoctoral fellowship Mentor: Dr. Richard Cohen
Vascular Biology Section, Department of Medicine, Boston University
- 07/2014 – Present Assistant Professor
Vascular Biology Section, Department of Medicine, Boston University
- 03/2018 – Present Assistant Professor
Sargent College's Department of Health Sciences, Boston University

Memberships and Leadership in Professional Societies

- 2012 – Present Member, American Heart Association (AHA)
- 2012 – Present Chinese American Academy of Cardiology (CAAC)
- 2013 – Present Member, American Physiology Society (APS)
- 2014 – Present Member, American Society for Pharmacology and Experimental Therapeutics (ASPET)
- 2019 – Present The Academy of Cardiovascular Research Excellence (ACRE)
- 2020 – Present Chinese American Heart Association (CNAHA)

Services and Major Administrative Leadership Positions

- 2021 – Present Modulator, Peer-to-Peer Faculty Writing Groups lead by Dr. Elaine Lee, Proposal Development (PD) at BU School of Medicine.
- 2021 – Present Faculty representative for School of Medicine at the Faculty Council

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2021 – Present BUSM committee member for Faculty Affairs Meetings

National/International Study Sections

2016 – Present Grant Reviewer, AHA, Vascular Endothelial Biology 1 Peer Review Group
2019 – 2020 Early Career Reviewer, NIH, Atherosclerosis and Inflammation of Cardiovascular System Study Section (AICS)
2019 – Present Grant Reviewer, Medical Research Council, United Kingdom

Editorial Board

2019 – Present Review Editor, Editorial Board, *Frontiers in Physiology/Oxidant Physiology*
2019 – Present Review Editor, Editorial Board, *Frontiers in General Cardiovascular Medicine*
2020 – Present Associate Editor, *Frontiers in Cardiovascular Medicine*
2020 – Present Guest Editor, *Frontiers in Cardiovascular Medicine*, *Cells*, *Oxidative Medicine and Cellular Longevity*

Ad Hoc Reviewing

2012 – Present *Ad Hoc* Reviewer for *Scientific Reports*, *Acta Pharmaceutica Sinica B*, *Redox Biology*, *Frontiers in Physiology/Vascular Biology*, *PLOS One*, *Cellular Immunology*, *Oncology Report*, *International Journal of Molecular Sciences*, *Journal of Physiology*, *Cell Biology International*, *Molecular Medicine Reports*, *Inflammation*
2019 – Present Thesis Advisory Committee for Master Program in Human Physiology

AWARDS

10/2019 – 10/2021 Evans Jr. Faculty Research Merit Award, Boston University School of Medicine
01/2007 – 12/2008 American Heart Association (AHA) Midwest Pre-doctoral Fellow Award
The University of Illinois at Chicago
05/2006 Trainee Travel Award
Central Society for Clinical Research, Chicago
09/2001 – 09/2002 University of Illinois Scholarship
The University of Illinois at Chicago
07/1993 – 07/1997 Outstanding Student Awards
Beijing Medical University, Beijing, China

RESEARCH INTEREST

Vascular endothelium as an interface between blood and vessel wall is vital to vascular health and disease through sensing and transmitting physiopathological signals into tissues as well as secreting vasoactive molecules. Dysfunctional endothelium thus plays a critical role in the initiation and progression of vascular disease, including acute lung injury and atherosclerosis. My research interests lie in endothelial biology, redox biology, and cardiovascular medicine. My ultimate goal is to contribute to the development of effective treatments for vascular diseases, and I have focused my research on three aspects: (1) understanding the molecular and cellular mechanisms that regulate vascular

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inflammation, endothelial dysfunction, pulmonary microvascular injury in sepsis, arterial vascular dysfunction, and atherosclerosis; (2) developing non-invasive methods to measure *in vivo* vascular function in small animal models to allow longitudinal study of changes in vascular function over the course of disease development and/or pharmacological interventions; and (3) exploring endothelial cell-targeted therapies for lung and cardiovascular diseases. My current research is focused on defining the role of redox-based post-translational protein modifications, such as S-glutathionylation on cysteine residues, in the regulation of macrovascular function, impairment of which is an early and reversible step in the pathogenesis of atherosclerosis, the major cause of cardiovascular diseases in response to risk factors such as aging, metabolic disorders, and alcohol abuse.

RESEARCH SUPPORT

Ongoing Research Support

R01HL137771, National Heart Lung Blood Institute (NHLBI)

02/01/2020 - 01/31/2024

Han, Jingyan (PI)

Role of protein S-glutathionylation in endothelial dysfunction and atherosclerosis

The goal of this project is to test the hypothesis that induction of endothelial protein S-glutathionylation on small RhoGTPase Rac1 by hypercholesterolemia promotes vascular endothelial dysfunction and atherogenesis.

Overlap: None.

R21AG058983, National Institute of Aging (NIA)

07/01/18 – 06/31/20

Han, Jingyan (PI)

Protein S-glutathionylation and vascular dysfunction with aging

The goal of this project is to identify aging-associated induction of vascular protein S-glutathionylation as a causal factor that contributes to the predisposition of the elderly to cardiovascular diseases.

Overlap: None

R21AA026922, National Institute of Alcohol Abuse and Alcoholism (NIAAA)

04/01/19 – 3/31/21

Han, Jingyan (Contact PI)

Alcohol-induced dysregulation of thiol homeostasis and endothelial function

The goal of this project is to establish redox-dependent mechanism underlying vascular endothelial injuries by chronic alcohol abuse.

Overlap: None

Evans Jr. Faculty Research Merit Award

10/2019 – 10/2021

Han, Jingyan (PI)

Boston University School of Medicine

Boston University CTSI Voucher Program

10/2020 – 3/2021

Pending Research Support

R01HL163144-01, National Heart Lung Blood Institute (NHLBI)

04/01/2022 - 3/31/2026

Han, Jingyan (PI)

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Redox Regulation of Endoplasmic Reticulum Stress Response and Vascular Dysfunction with Aging

The goal of this project is to obtain fundamental knowledge of how aging causes deregulation of endoplasmic reticulum hemostasis in endothelial cells, leading to vascular dysfunction in aged patients. Overlap: None.

Note: Pending for scientific review.

Completed Research Support

NIH Ruth L. Kirschstein Postdoctoral Research Training Award (T32)

07/2010 – 01/2012

Cardiovascular Biology led by Dr. Peter F. Davies
Department of Pharmacology, University of Pennsylvania

NIH Ruth L. Kirschstein Postdoctoral Research Training Award (T32)

12/2013 – 06/2014

Cardiovascular Medicine led by Dr. Victoria Bolotina
Whitake Cardiovascular Research Institute, Boston University

BU Clinical & Translational Science Institute Pilot Grant Program (1UL1TR001430)

06/31/15 – 6/30/16

Han, Jingyan (PI)

Protein S-glutathionylation: a therapeutic target in cardiovascular diseases

The primary aim of this research is to generate preliminary key data for a planned grant application, including identification of glutathionylated proteins in metabolically stressed-endothelial cells and glutaredoxin-1 specific targets in a redox proteomic study, and determining whether the formed protein S-glutathionylation may be reversed by recombinant glutaredoxin-1.

14SDG20140036, American Heart Association (AHA)

07/01/14 - 06/31/18

Han, Jingyan (PI)

The role of glutaredoxin-1 in hyperlipidemia-induced vascular barrier dysfunction

The goal of this study is to determine whether glutaredoxin-1, a glutathione-dependent redox enzyme, plays a role in aortic endothelial cells in sensing hyperlipidemia and mediating its detrimental effect on vascular barrier integrity.

Overlap: None.

R56HL130194, National Heart Lung Blood Institute (NHLBI)

09/01/17 - 09/01/19

Han, Jingyan (PI)

The role of vascular protein S-glutathionylation in atherosclerosis

The goal of this project is to attain critical preliminary data to support our central hypothesis that induction of endothelial protein S-glutathionylation by hypercholesterolemia promotes vascular endothelial dysfunction and atherogenesis.

Overlap: None.

PUBLICATIONS

ORCID  : [0000-0001-9893-2575](https://orcid.org/0000-0001-9893-2575)

Mentees names are underlined

†Corresponding author

*Denotes shared first authorship

Original Research

1. Liu G, **Han J**, Profirovic J, Strelakova E, Voyno-Yasenetskaya TA. Galpha13 regulates MEF2-dependent gene transcription in endothelial cells: role in angiogenesis. *Angiogenesis*. 2009; 12(1):1-15. PMID: 19093215; PMCID: PMC2855211
2. Zhang G, **Han J**, Welch EJ, Ye RD, Voyno-Yasenetskaya TA, Malik AB, Du X, Li Z. Lipopolysaccharide stimulates platelet secretion and potentiates platelet aggregation via TLR4/MyD88 and the cGMP-dependent protein kinase pathway. *J Immunol*. 2009; 182(12):7997-8004. PMID: 19494325; PMCID: PMC2787095
3. Gorovoy M,* **Han J**,* Pan H, Welch E, Neamu R, Jia Z, Predescu D, Vogel S, Minshall RD, Ye RD, Malik AB, Voyno-Yasenetskaya T. LIM kinase 1 promotes endothelial barrier disruption and neutrophil infiltration in mouse lungs. *Circ Res*. 2009; 105(6):549-56. PMID: 19679840; PMCID: PMC3718297
4. **Han J**, Liu G, Profirovic J, Niu J, Voyno-Yasenetskaya T. Zyxin is involved in thrombin signaling via interaction with PAR-1 receptor. *FASEB J*. 2009;23(12):4193-206. PMID: 19690217; PMCID: PMC2812041
5. Andreeva AV, **Han J**, Kutuzov MA, Profirovic J, Tkachuk VA, Voyno-Yasenetskaya TA. T-cadherin modulates endothelial barrier function. *J Cell Physiol*. 2010;223(1):94-102. PMID: 20039275
6. Feng H, Guo L, Song Z, Gao H, Wang D, Fu W, **Han J**, Li Z, Huang B, Li XA. Caveolin-1 protects against sepsis by modulating inflammatory response, alleviating bacterial burden, and suppressing thymocyte apoptosis. *J Biol Chem*. 2010; 285(33):25154-60. PMID: 20534584; PMCID: PMC2919077
7. Shuvaev VV, **Han J**, Yu KJ, Huang S, Hawkins BJ, Madesh M, Nakada M, Muzykantov VR. PECAM-targeted delivery of SOD inhibits endothelial inflammatory response. *FASEB J*. 2011; 25(1):348-57. PMID: 20876216; PMCID: PMC3005426
8. Profirovic J,* **Han J**,* Andreeva AV, Neamu RF, Pavlovic S, Vogel SM, Walter U, Voyno-Yasenetskaya TA. Vasodilator-stimulated phosphoprotein deficiency potentiates PAR-1-induced increase in endothelial permeability in mouse lungs. *J Cell Physiol*. 2011; 226(5):1255-64. PMID: 20945373; PMCID: PMC3043150
9. **Han J**, Shuvaev V, Muzykantov VR. Catalase and superoxide dismutase conjugated with platelet endothelial cell adhesion molecule antibody distinctly alleviate abnormal endothelial permeability caused by exogenous reactive oxygen species and vascular endothelial growth factor. *J Pharmacol Exp Ther*. 2011. PMID:21474567.MCID: PMC3126647
10. **Han J**, Zern BJ, Shuvaev VV, Davies PF, Muro S, Muzykantov V. Acute and chronic shear stress differently regulate endothelial internalization of nanocarriers targeted to platelet-endothelial cell adhesion molecule-1. *ACS Nano*. 2012; 6(10):8824-36. PMID: 22957767; PMCID: PMC3874124
11. Hood ED, Greineder CF, Dodia C, **Han J**, Mesaros C, Shuvaev VV, Blair IA, Fisher AB, Muzykantov VR. Antioxidant protection by PECAM-targeted delivery of a novel NADPH-oxidase inhibitor to the endothelium in vitro and in vivo. *J Control Release*. 2012;163(2):161-9. PMID: 22974832; PMCID: PMC3495982
12. Shuvaev VV, **Han J**, Tliba S, Arguiri E, Christofidou-Solomidou M, Ramirez SH, Dykstra H, Persidsky Y, Atochin DN, Huang PL, Muzykantov VR. Anti-inflammatory effect of targeted delivery

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of SOD to endothelium: mechanism, synergism with NO donors and protective effects in vitro and in vivo. *PLoS One*. 2013; 8(10):e77002. PMID: 24146950; PMCID: PMC3795626

13. **Han J**, Zhang G, Welch EJ, Liang Y, Fu J, Vogel SM, Lowell CA, Du X, Cheresh DA, Malik AB, Li Z. A critical role for Lyn kinase in strengthening endothelial integrity and barrier function. *Blood*. 2013; 122(25):4140-9. PMID: 24108461; PMCID: PMC3862279
14. Greineder CF, Chacko AM, Zaytsev S, Zern BJ, Carnemolla R, Hood ED, **Han J**, Ding BS, Esmon CT, Muzykantov VR. Vascular immunotargeting to endothelial determinant ICAM-1 enables optimal partnering of recombinant scFv-thrombomodulin fusion with endogenous cofactor. *PLoS One*. 2013; 8(11):e80110. PMID: 24244621; PMCID: PMC3828233
15. Murdoch CE, Shuler M, Haeussler DJ, Kikuchi R, Bearely P, **Han J**, Watanabe Y, Fuster JJ, Walsh K, Ho YS, Bachschmid MM, Cohen RA, Matsui R. Glutaredoxin-1 up-regulation induces soluble vascular endothelial growth factor receptor 1, attenuating post-ischemia limb revascularization. *J Biol Chem*. 2014; 289(12):8633-44. PMID: 24482236; PMCID: PMC3961686
16. Shao D, Fry JL, **Han J**, Hou X, Pimentel DR, Matsui R, Cohen RA, Bachschmid MM. A redox-resistant sirtuin-1 mutant protects against hepatic metabolic and oxidant stress. *J Biol Chem*. 2014; 289(11):7293-306. View Related Profiles. PMID: 24451382; PMCID: PMC3953247
17. **Han J**, Shuvaev VV, Davies PF, Eckmann DM, Muro S, Muzykantov VR. Flow shear stress differentially regulates endothelial uptake of nanocarriers targeted to distinct epitopes of PECAM-1. *J Control Release*. 2015; 210:39-47. PMID: 25966362; PMCID: PMC4793278
18. Chacko AM,* **Han J**,* Greineder CF, Zern BJ, Mikitsh JL, Nayak M, Menon D, Johnston IH, Poncz M, Eckmann DM, Davies PF, Muzykantov VR. Collaborative Enhancement of Endothelial Targeting of Nanocarriers by Modulating Platelet-Endothelial Cell Adhesion Molecule-1/CD31 Epitope Engagement. *ACS Nano*. 2015; 9(7):6785-93. PMID: 26153796; PMCID: PMC4761649
19. Luo T, Nocon A, Fry J, Sherban A, Rui X, Jiang B, Xu XJ, **Han J**, Yan Y, Yang Q, Li Q, Zang M. AMPK Activation by Metformin Suppresses Abnormal Extracellular Matrix Remodeling in Adipose Tissue and Ameliorates Insulin Resistance in Obesity. *Diabetes*. 2016; 65(8):2295-310. PMID: 27207538; PMCID: PMC4955985
20. Cohen RA, Murdoch CE, Watanabe Y, Bolotina VM, Evangelista AM, Haeussler DJ, Smith MD, Mei Y, Tong X, **Han J**, Behring JB, Bachschmid MM, Matsui R. Endothelial Cell Redox Regulation of Ischemic Angiogenesis. *J Cardiovasc Pharmacol*. 2016;67(6):458-64. PMID: 26927696; PMCID: PMC4899292
21. **Han J**,[†] Weisbrod RM, Shao D, Watanabe Y, Yin XY, Bachschmid MM, Seta F, Janssen-Heininger YMW, Matsui R, Zang M, Hamburg NM, Cohen RA. The redox mechanism for vascular barrier dysfunction associated with metabolic disorders: glutathionylation of Rac1 in endothelial cells. *Redox Biol*. 2016; 9:306-319. PMID: 27693992
22. Shao D,* **Han J**,* Hou X, Fry JL, Behring JB, Seta F, Long M, Roy H, Cohen RA, Matsui R, Bachschmid MM. Glutaredoxin-1 deficiency causes fatty liver and dyslipidemia by inhibiting sirtuin-1. *Antioxid Redox Signal*. 2016;(6):313-327 PMID: 2795888327
23. Song W, Zhou L, Kot KL, Fan H, **Han J**,[†] Yi J[†]. Measurement of flow-mediated dilation of mouse femoral artery in vivo by optical coherence tomography. *J Biophotonics*. 2018;11(11):e201800053. PMCID: PMC6226329
24. Chen H, Shen F, Sherban A, Nocon A, Li Y, Wang H, Xu MJ, Rui X, **Han J**, Jiang B, Lee D, Li N, Keyhani-Nejad F, Fan JG, Liu F, Kamat A, Musi N, Guarente L, Pacher P, Gao B, Zang M. DEP

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domain-containing mTOR-interacting protein suppresses lipogenesis and ameliorates hepatic steatosis and acute-on-chronic liver injury in alcoholic liver disease. *Hepatology*. 2018;68(2):496-514. PMID: 29457836

25. Weinberg EO, Ferran B, Tsukahara Y, Hatch MMS, **Han J**, Murdoch CE, Matsui R. IL-33 induction and signaling are controlled by glutaredoxin-1 in mouse macrophages. *PLoS One*. 2019;25:14(1), PMID: 30682073
26. Kerstin S, Wan X, Zhang M, Zhou Y, Zang M, **Han J**[†], Alcohol binge drinking selectively stimulates protein S-glutathionylation in aorta and liver of ApoE deficient mice. *Frontiers in Cardiovascular Medicine*. 2021; March 16, PMID: 33796575 .
27. Zhou Y, Wan X, Seidel K, Zhang M, Goodman JB, Seta F, Hamburg M, **Han J**[†], Aging and Hypercholesterolemia Differentially Affect the Unfolded Protein Response in the Vasculature of ApoE^{-/-} Mice. *JAHA*. 2021 Sep 21;10(18):e020441, PMID: 34533042

Patents

1. Application of optical coherence tomography angiography (OCTA) based imaging system to measure in vivo endothelial function of macroarterial vessels of intact rodent animals, Primary Inventor: Jingyan Han, U.S. Provisional Application Number 63/215026, June 25, 2021.

Invited Review Articles and Book Chapters

1. **Han J**, Shuvaev VV, Muzykantov VR. Targeted interception of signaling reactive oxygen species in the vascular endothelium. *Ther Deliv*. 2012;3(2):263-76. PMID: 22834201
2. Edenbaum H, **Han J**[†]. Assessment of S-Glutathionylated Rac1 in Cells Using Biotin-Labeled Glutathione. *Methods Mol Biol*. 2018;1821:155-163. PMID: 30062411
3. Matsui R, Ferran B, Oh A, Croteau D, Shao D, **Han J**, Pimentel DR, Bachschmid MM. Redox Regulation via Glutaredoxin-1 and Protein S-Glutathionylation. *Antioxid Redox Signal*. 2020; 32(10):677-700. PMID: 31813265
4. **Han J**[†], Goodman J, Zhang, M, Li, Z. *Organelle and Molecular Targeting Textbook*, Chapter 9: Cardiovascular Drug Delivery System, CRC Press, Taylor and Francis, 2021, April.

Invited Lectures (International and National)

- 2021 **Invited Speaker**, ACRE-CAAC Joint Seminar Series 2021 (Virtual), March 3, 2021
Protein S-glutathionylation: Small Reversible Oxidative Modification, Big Role in Cardiovascular Disease
- 2021 **Invited Speaker**, The 15th Oriental Congress of Cardiology (Virtual), May 27-30, 2021.
Role of Redox Signaling in Atherosclerosis

