

BIOGRAPHICAL SKETCH

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NAME: **Heydarpour, Mahyar**

eRA COMMONS USER NAME (credential, e.g., agency login) : **mheydarpour**

POSITION TITLE: **Research Scientist- Instructor (Statistical Geneticist) , PhD**

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	Completion date MM/YYYY	FIELD OF STUDY
Ferdowsi University of Mashhad - Iran	B.Sc.	06/1990	Animal Science
Tehran University – Tehran - Iran	M.Sc.	04/1995	Animal Genetics
University of Guelph, Guelph, ON, Canada	Ph.D.	09/2006	Quantitative Genetics
McMaster University, Hamilton, ON, Canada	Postdoctoral	02/2011	Population genomics
University of Guelph, Guelph, ON, Canada	Postdoctoral	12/2012	Bovine genomics, Biostat

A. Personal Statement

I am a Research Scientist (Instructor) in the department of Medicine, division of Endocrinology and division of Infection Disease at MGB and an associate biostatistician at CCI (center of clinical investigation). As a faculty member I am participating in the full range of academic activities for the Endocrinology division, including mentoring of trainees (postdoc, research fellows, and residence), seminar series, internal proposal review and occasional internal symposium. For the research part, I am assisting investigators with their grant submissions and creating statistical plans for their research protocols. I am also dedicate to supporting the clinical and research faculties in the division of Endocrinology, Diabetes, and Hypertension. My time is mostly focused on statistical design for complex models, power calculations, and statistical analysis for writing statistical sections of grant applications, abstract submission and journal articles. During March 2013-Dec 2019, I was a research scientist at the department of Anesthesiology, Perioperative and Pain Medicine at the Brigham and Women's Hospital, Boston, MA and an Instructor of Harvard Medical School. I was involved in the Perioperative Genomics Center program which studies the enrollment of patients undergoing cardiac surgery and subsequent examination of genetic causes/associations of adverse events after cardiac surgery for the past ten years. The program has been a singularly successful environment for perioperative studies and has been the recipient of funding from NIH, AHA and several foundations.

Within last 7 years I also was involved in many clinical research trials as a Statistician Consulter and performed many statistical analyses. During 2011-2012, I was worked in the Center for Genetic Improvement of Livestock (CGIL) at the University of Guelph, Canada, as a postdoctoral research fellow. I was involved with many genomic projects of bovine genome. I was responsible for consolidating data to use for genomic analysis, developing new statistical methods for genome wide selection in multiple-breed analysis and using new methods for imputation and prediction of missing genotypes. I had this opportunity to work in the field of human genomics at McMaster University. During my postdoctoral period (2009-2011) at the Population Genomics Program (PGP) in the department of Medicine at McMaster University, I was involved in several genomic projects examining complex diseases including cardiovascular disease, metabolic syndrome and cancer. I was responsible for extracting and preparing data, statistical analysis, interpreted the results, literature reviews and provided technical report. In general, the main objective of the research projects at the PGP were to identify novel susceptibility genes using high-throughput sequencing in multi-ethnic populations worldwide to better understand the physiological and molecular mechanisms underlying the development of chronic complex diseases. Some of my credentials and skills are highlighted in the following papers:

1. Bo Yang, Wei Zhou, Jiao Jiao, Jonas B. Nielsen, Michael Mathis, **Mahyar Heydarpour**, Guillaume Lettre, Lasse Folkersen, Siddharth Prakash, Claudia Schurmann, Lars Fritsche, Gregory A. Farnum, Maoxuan Lin, Mohammad Othman, Whitney Hornsby, Anisa Driscoll, Alexandra Lévasseur, Marc Thomas, Linda Farhat, Marie-Pierre Dubé, Eric M. Isselbacher, Anders Franco-Cereceda, Dong-chuan Guo, Erwin P. Bottinger, G. Michael Deeb, Anna Booher, Sachin Kheterpal, Y. Eugene Chen, Hyun Min Kang, Jacob Kitzman, Heather J. Cordell, Bernard D. Keavney, Judith A. Goodship, Santhi Ganesh, Gonçalo Abecasis, Kim Eagle, Alan P. Boyle, Bicuspid Aortic Valve Consortium, Ruth J.F. Loos, Per Eriksson, Jean-Claude Tardif, Chad M. Brummett, Dianna Milewicz, Simon C. Body, and Cristen J. Willer. Protein-altering and regulatory genetic variants near *GATA4* implicated in Bicuspid Aortic Valve. *Journal of Nature Communication*. 2017 May 25;8:15481. PMID: PMC5458508.
2. Anna Helgadóttir, Gudmar Thorleifsson, Solveig Gretarsdóttir, Olafur A Stefansson, Vinicius Tragante, Rosa B Thorolfsdóttir, Ingileif Jonsdóttir, Thorsteinn Bjornsson, Valgerdur Steinthorsdóttir, Niek Verweij, Jonas B Nielsen, Wei Zhou, Lasse Folkersen, Andreas Martinsson, **Mahyar Heydarpour**, Siddharth Prakash, Gylfi Oskarsson, Tomas Gudbjartsson, Arnar Geirsson, Isleifur Olafsson, Emil L Sigurdsson, Peter Almgren, Olle Melander, Anders Franco-Cereceda, Anders Hamsten, Lars Fritsche, Maoxuan Lin, Bo Yang, Whitney Hornsby, Dongchuan Guo, Chad M Brummett, Goncalo Abecasis, Michael Mathis, Dianna Milewicz, Simon C Body, Per Eriksson, Cristen J Willer, Kristian Hveem, Christopher Newton-Cheh, J Gustav Smith, Ragnar Danielsen, Gudmundur Thorgeirsson, Unnur Thorsteinsdóttir, Daniel F Gudbjartsson, Hilma Holm, Kari Stefansson. Genome wide analysis yields new loci associating with aortic valve stenosis. *Journal of Nature communication*. March 2018. Vol 9. PMID: PMC5840367.
3. Naida M. Cole, Kamen Vlassakov, Ethan Y. Brovman, **Mahyar Heydarpour**, and Richard D. Urman. Regional Anesthesia for Arteriovenous Fistula Surgery May Reduce Hospital Length of Stay and Reoperation Rates. *Journal of Vascular and Endovascular Surgery*. 2018 Aug; 52(6):418-426. PMID: 29706126.
4. **Mahyar Heydarpour**, Julius Ejfor, Michael Gilfeather, Gregory Stone, Josh Gorham, Christine Seidman, Jon Seidman, Maroun Yammine, Simon Body, Sary Aranki, Jochen D. Muehlschlegel. Molecular Genetics of Lidocaine-containing Cardioplegia in the Human Heart during Cardiac Surgery. *The Annals of Thoracic Surgery Journal*. 2018 Nov;106 (5):1379-1387. PMID: PMC6203633.

B. Positions and Honors

Positions and Employment

1990-1995	Genetic lab Technician, Animal Science, Ferdowsi University, Mashhad-Iran
1995-2001	Lecturer, Animal Science Department, Ferdowsi University, Mashhad-Iran
2001-2006	PhD Student, CGIL, Animal Science Department, University of Guelph, Ontario, Canada
2006-2008	Assistant Professor, Animal Science, Ferdowsi University, Mashhad-Iran
2009-2011	Postdoctoral Fellow, Medicine Dept., McMaster University, Ontario, Canada
2011-2013	Postdoctoral Fellow, CGIL, Animal Science Dept., University of Guelph, Ontario, Canada
2013- 2016	Research Scientist, Anesthesiology Dept., BWH, Harvard Medical School, Boston, MA
2016- Nov 2019	Instructor, Anesthesiology Dept., BWH, Harvard Medical School, Boston, MA
Dec 2019-present	Instructor, Dept. of Medicine, Division of Endocrinology, MGB Hospital, Boston, MA

Other Experience and Professional Memberships

1995-2001	Member, Scientific Advisory Board, Animal Sci. Dept., Ferdowsi University, Mashhad -Iran
1999-2001	Genetic Consultant, Dairy cattle Farmer's union, Mashhad-Iran
2006-2008	Member, Scientific Advisory Board, Biotechnology Dept., Ferdowsi University, Iran
2009-2011	Member, Postdoctoral in Medicine Department, McMaster University, Ontario, Canada
2012-2013	Member, Scientific advisory board committee of DCBGC, University of Guelph, Canada
2014-present	Member, Statistical and Systems Genetics Working Group, Channing, Medicine, Boston, MA
2014-present	Member, Medical & Population Genetics meeting, Broad Institute, Cambridge, MA
2014-present	Member, Boston area eQTL meeting, Broad Institute, Cambridge, MA
2014-2019	Member, Perioperative genomics center, Anesthesiology Dept., Boston, MA
2019-present	Member, CERG, Endocrinology Research Group, MGB hospital, Boston, MA

Honors:

1990	Academic award for outstanding B.Sc. student, Ferdowsi University of Mashhad, Iran
1994	Acknowledgement award for creative works, University of Tehran, Tehran, Iran
1998	Best Paper Award for Young Scientists, WCAP, Seoul, South Korea
2001	Scholarship Award for PhD program as an outstanding Instructor, MSRT of Iran, Iran
2006	GGSF Dean Award, support PhD's program extra costs, University of Guelph, Canada
2008	Distinguished researcher Award, Ferdowsi University of Mashhad, Iran

C. Contribution to Science

My early publications are related to my previous career when I was Assistant Professor in Ferdowsi University in Mashhad, Iran. Most of them are extracted from thesis of my graduate students whom I was their supervisor. One of them extracted from my PhD thesis that investigate the impact of population structure on estimates of direct and maternal parameters using simulation study. Our finding shown there is a negative correlation between direct and maternal effect parameters in second generation of each mating needs to be consider in BLUP methods.

1. Sadeghi, B., Nassiry, M. R., **Heydarpour, M.**, and F. Eftekhar Shahroudi, J. Mosafer and A. Shafagh (2008). Characterization of Genetic Polymorphism of the Bovine Lymphocyte Antigen DRB3.2 Locus in Sistani Cattle of Iran (*Bos indicus*), *Biotechnology*, 7 (2): 333-337. (No PMID is required)
2. **Heydarpour, M.**, Schaeffer, L., and M. H. Yazdi. (2008) Influence of population structure on estimates of direct and maternal parameters. *J. Anim. Breed. Genet.* 2008 Apr;125(2):89-99. PMID: 18363974.
3. Arshami, J., **Heydarpour, M.**, Zarghi, H., Pilevar, M., and M. Esmailzadeh (2009) Long term effects of Oxymetholone vs. Testosterone with or without ZnSo4 on growth performance of Turkey chicks. *International Journal of Poultry Science* 8(5): 470 – 474. (no PMID is required)
4. Mosafer, J., **Heydarpour, M.**, Manshad, E., Russell, G., and G.E. Sulimova. Distribution of BoLA-DRB3 allelic frequencies and identification of two new alleles in Iranian Buffalo breed. *The scientific World Journal.* 2012;2012:863024. Epub 2012 Feb 14. PMID: PMC3289872.

During my postdoctoral period (2009-2011) at the Population Genomics Program (PGP) in the department of Medicine at McMaster University, Canada, I was involved in several genomic projects examining complex diseases including cardiovascular disease, metabolic syndrome such as Type 1 and Type 2 diabetes, and cancer. I was responsible for extracting and preparing data, statistical analysis, interpreted the results, literature reviews and provided technical report. In general, the main objective of the research projects at the PGP were to identify novel susceptibility genes using high-throughput sequencing in multi-ethnic populations worldwide to better understand the physiological and molecular mechanisms underlying the development of chronic complex diseases. I had a research contribution with AVESINA Medical Research Institute in Iran and the result of this contribution was a paper that published in *Journal of Molecular Biology* report on 2011. This article has been cited 72 times during last eight years which is a great record in this complex specialty.

- a. Mohammadnejad, Z., Tavakol, J., Ghanbari, M., **Heydarpour, M.**, Taghavi, M., Ganjali, R., and H. Rafatpanah. Association between Vitamin D receptor gene polymorphisms and type 1 diabetes in Iranian population. *Journal of Molecular Biology Report*, May 2011. PMID: 21584699.
- b. Zbuk, K., Xie, C., Young, R., **Heydarpour, M.**, Pare, G., Davis, D., Miller, R., Lanktree, M., Saleheen, D., Danesh, J., Yusuf, S., Engert, J., Hegele, R.A., and S. Anand. BRCA2 variants and cardiovascular disease in a multi-ethnic study. *BMC Medical Genetics*. 2012 Jul 18;13:56. PMID: PMC3464815.
- c. Mente, A., Meyre, D., Lanktree, M.B., **Heydarpour, M.**, Davis, A.D., Miller, R., Gerstein, H., Hegele, R.A., Yusuf, S., and S. Anand, for the SHARE and SHARE-AP investigators. Causal relationship between Adiponectin and metabolic traits: A Mendelian randomization study in a multiethnic population. *PLoS ONE*, 2013 Jun 24;8(6):e66808. PMID: PMC3691277.

During my work at the center for perioperative genomics (2013-Dec 2019) at Brigham Women's Hospital, I was involved studies the enrollment of patients undergoing cardiac surgery and subsequent examination of genetic/genomic causes/associations of adverse events after cardiac surgery. I involved statistical analysis for Genome Wide Association Study (GWAS) of Bicuspid Aortic valve (BAV) and Atrial Fibrillation (AF) for patients undergoing cardiac surgery during last three years. The aim of this study was to identify genetic markers to be associated with BAV. I performed gene-expression analysis for AF using tissue-samples of left-Atrial (LA) in order to identifying expression quantitative trait loci (eQTL) in Human left atrium associated with AF. I also performed GWAS analysis for Aortic Stenosis (AS) and aortic dimension in a cohort of BAV disease. Furthermore, I was involved in RNAseq data analysis for the ischemic Human left ventricle (LV) for patients undergoing aortic valve replacement surgery with cardiopulmonary bypass. The following highlighted works are published in the following peer reviewed Journals.

- a. Gregory Stone, Ashley Choi, Meritxell Oliva, Josh Gorham, **Mahyar Heydarpour**, Christine E Seidman, Jon G Seidman, Sary F Aranki, Simon C Body, Vincent J Carey, Benjamin A Raby, Barbara E Stranger, Jochen D Muehlschlegel. Sex differences in gene expression in response to ischemia in the human myocardium. *Hum Mol Genet*. 2019 May 15; 28(10):1682-1693.
- b. Tsuyoshi Kaneko, Sameer Hirji, Edward Percy, Sary Aranki, Siobhan McGurk, Simon Body, **Mahyar Heydarpour**, Hari Mallidi, Steve Singh, Marc Pelletier, James Rawn and Prem Shekar. Characterizing Risks Associated with Mitral Annular Calcification in Mitral Valve Replacement. *Ann Thorac Surg*. 2019 Jun 14. pii: S0003-4975(19)30838-0.
- c. Diana B. Fulmer, Katelynn A. Toomer, Lilong Guo, Kelsey Moore, Janiece Glover, Rebecca Stairley, Glenn P. Lobo, Xiaofeng Zuo, Yujing Dang, Yanhui Su, Ben Fogelgren, Patrick Gerard, Dongjun Chung, **Mahyar Heydarpour**, Rupak D. Mukherjee, Simon C. Body, Russell A. Norris, and Joshua H. Lipschutz. Defects in the Exocyst-Cilia Machinery Cause Bicuspid Aortic Valve Disease and Aortic Stenosis. *Circulation*, 2019 Oct 15. 140(16): 1331-1341.
- d. Shyamal R Asher, Gregory W Malzberg, Chin Siang Ong, Raymond J Malapero, Huan Wang, Prem Shekar, Tsuyoshi Kaneko, Marc P Pelletier, Hari Mallidi, **Mahyar Heydarpour**, Douglas C Shook, Stanton K Shernan, John A Fox, J Daniel Muehlschlegel, Xinling Xu, Thy B Nguyen, Thoralf M Sundt, Simon C Body. Joint preoperative transthoracic and intraoperative transoesophageal echocardiographic assessment of functional mitral regurgitation severity provides better association with long-term mortality. *Interactive Cardiovascular and Thoracic Surgery*. 2021 Jan 5. 32(1): 9-19.

Completed List of published work in My Bibliography:

https://www.researchgate.net/profile/Mahyar_Heydarpour

<https://scholar.google.com/citations?user=6QCBG-kAAAAJ&hl=en>

D. Additional Information: Research Support and/or Scholastic Performance

Completed Research Studies:

AHA 17CSA33590067 Lipschutz, Joshua (PI) ; Body, Simon C (Co-PI)

07/01/2017- 09/30/2019

Genetic and Molecular Determinants of Bicuspid and Calcific Aortic Valve Disease

The goal of this study is to identify the role of primary cilia in the embryonic development of the bicuspid aortic valve and their subsequent role in CAVD. Role: Co-Investigator

R01 HL114823-05 Body, Simon C (PI) 08/23/2012 – 07/31/2018
NIH-NHLBI National Heart, Lung, and Blood Institute
Genetic Etiology of Bicuspid Aortic Valve Disease
The major goals of this project are to identify genetic causes of bicuspid aortic valve disease using human genetic association study methods with replication in zebra-fish model of BAV. Role: Co-Investigator

R01 HL098601-05 Body, Simon C (PI) 05/01/2010 – 04/30/2016
NIH-NHLBI National Heart, Lung, and Blood Institute
Identification of Genetic and Molecular Mechanisms of Atrial Fibrillation. The major goals of this project are to identify biological mechanisms for the well-replicated association between variants in the 4q25 chromosomal locus and atrial fibrillation using a cohort undergoing cardiac surgery. Role: Co-Investigator

Ongoing Research projects:

T32 007609-31 (Adler, G) 08/01/2018 – 07/31/2023
NIH/NHLBI
Training program in Hypertension. Role: Faculty

UL1TR002541 (Nadler, LM) 6/01/2018 – 5/31/2023
NIH/NCATS
The Harvard Clinical and Translational Science Center
This grant mechanisms funds clinical research infrastructure, education, training for Harvard-based systems and provides salary support for Biostatistical Support Core. Role: Biostatistician (Support Core)

R01HL144779 (Williams, G) 5/01/2019 – 4/20/2023
NIH/NHLBI
Salt sensitive hypertension and striatin
Salt sensitivity of blood pressure is a substantial risk factor for cardiovascular morbidity and mortality. Aldosterone is implicated as a mediator of risk. Striatin is a co-regulator of aldosterone function. This program will explore genetically modified animals and human genetic variants in striatin to clarify the role it plays in the development of salt sensitivity. Role: Co-investigator

R01HL127146 (Williams, J) 2/01/2016 – 7/31/2021
NIH/NHLBI
Epigenetic regulation of aldosterone and salt sensitivity in hypertension
This project aims to determine the functional role of the epigenetic regulator, LSD1, on regulation of aldosterone production and salt sensitivity of the blood pressure. Role: Co-investigator

R01HL136567-01 (Adler, G) 2/01/2017 – 1/31/2021
NIH/NHLBI
Regulation of Aldosterone: The Effect of Statins
This project aims to show that statins decrease aldosterone secretion in humans, with mechanistic animal studies. Role: Co-investigator

R01 HL141406 (Wainford, RD) 5/01/2018 – 2/28/2022
NIH/NHLBI
Central mechanisms and novel biomarkers of the salt-sensitivity of blood pressure
The goal of this project is to determine how the G-alpha subunit protein interacts with dietary salt to affect blood pressure. The human research aim explores genetic variations in the G-alpha subunit in hypertension and the association with altered renin-angiotensin-aldosterone system activity. Role: Co-investigator