

Aaron S. Eisman

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EDUCATION

MD-PhD Student, Biomedical Informatics and Computational Biology, Brown University
ScB, Applied Mathematics, Brown University, 2008

RESEARCH INTERESTS

My current research interests include the development of biomedical informatics methods that leverage population-level data to improve the accuracy of cardiovascular disease risk estimation. My work aims to improve adherence to clinical practice guidelines, enhance the precision of preventative medical therapies, better explain observed health outcome disparities in racial and ethnic minority populations, and develop mechanisms for translating omics research into clinical medical practice.

PROFESSIONAL EXPERIENCE

Data Manager (~4hrs/wk), Massachusetts General Hospital, 2015-present

Manages data quality metrics for the MGH Cardiovascular Biorepository and seeks to improve ongoing operation processes through streamlining and automation.

Clinical Research Coordinator, Massachusetts General Hospital, 2013-2015

Coordinated NIH and industry-sponsored heart failure and exercise physiology clinical trials. Used clinically indicated cardiopulmonary exercise testing with right heart catheterization to elucidate potential pre-clinical manifestations of heart failure in patients with dyspnea on exertion.

Director of Technology, Paskewitz Asset Management, 2008-2013

Responsible for managing research and development of global quantitative trading strategies as well as firm-wide technology innovation and implementation including the transition to entirely cloud-based scalable trading, research, and development architecture using Amazon Web Services.

Research Assistant, Koleske Lab, Yale University, 2005-2007

Demonstrated first in vivo phenotypic dysregulation of neurogenesis in Arg^{-/-} mice by observing that they do not undergo normal morphological maturation.

Teaching

Teaching Assistant, Biomedical Informatics and Data Science Skills - Brown University, Summer 2019

Designed and gave a lecture with a live programming demonstration on Plotting and Data Visualisation. Assisted students with programming during class and office hours. Met with individual students to design and implement summer research projects.

Teaching Assistant, Methods in Informatics and Data Science for Health - Brown University, Spring 2019

Assisted students with course material during live programming exercises in class, office hours, and via electronic communication. Met with teams to design and implement their Course-based Undergraduate Research Experience projects.

Instructor, Introduction to Exercise Physiology - Brown University STEM II Summer Program, July 2016

Designed and taught a two-week course to rising 9th and 10th-grade students introducing them to exercise physiology. Daily interactive 3-hour lectures with four 3-hour afternoon sessions in the Brown exercise lab.

Volunteer

Brown Student Free Clinic @ Rhode Island Free Clinic, Board Member, 2015-2017

Patient Aide, Yale New Haven Hospital CCU, 2012-2013

Providence Science Outreach Co-Coordinator, Brown University, 2004-2006

PUBLICATIONS

Usman A Tahir, Daniel H Katz, Julian Avila-Pachecho, Alexander G Bick, Akhil Pampana, Jeremy M Robbins, Zhi Yu, Zsu-Zsu Chen, Mark D Benson, Daniel E Cruz, Debby Ngo, Shuliang Deng, Xu Shi, Shuning Zheng, **Aaron S Eisman**, Laurie Farrell, Michael E Hall, Adolfo Correa, Russell P Tracy, Peter Durda, Kent D Taylor, Yongmei Liu, W Craig Johnson, Xiuqing Guo, Jie Yao, Yii-Der Ida Chen, Ani W Manichaikul, Frederick L Ruberg, William S Blaner, Deepti Jain, NHLBI Trans-Omics for Precision Medicine 1 Consortium, Claude Bouchard, Mark A Sarzynski, Stephen S Rich, Jerome I Rotter, Thomas J Wang, James G Wilson, Clary B Clish, Pradeep Natarajan, Robert E Gerszten. Whole Genome Association Study of the Plasma Metabolome Identifies Metabolites Linked to Cardiometabolic Disease in Black Individuals. *Nat Commun* [Internet]. 2022 Aug 22;13(1):4923. Available from: <http://dx.doi.org/10.1038/s41467-022-32275-3>

Aaron S Eisman, Katherine A. Brown, Elizabeth S. Chen, Indra Neil Sarkar. Clinical Note Section Detection Using a Hidden Markov Model of Unified Medical Language System Semantic Types. *AMIA Annu Symp Proc* 2021.

Aaron S Eisman, Nishant R Shah, Carsten Eickhoff, George Zerveas, Elizabeth S Chen, Wen-Chih Wu, Indra Neil Sarkar. Extracting Angina Symptoms from Clinical Notes Using Pre-Trained Transformer Architectures. *AMIA Annu Symp Proc* 2020.

Nishant R Shah*, **Aaron S Eisman***, David Winchester, Alan R Morrison, Reema Qureshi, Indra Neil Sarkar, Wen-Chih Wu. E-Consult Protocoling to Improve the Quality of Cardiac Stress Tests. *JACC Cardiovasc Imaging* [Internet]. 2020 Sep 26; Available from: <http://dx.doi.org/10.1016/j.jcmg.2020.08.009>

Jennifer E Ho, Emily K Zern, Emily S Lau, Luke Wooster, Cole S Bailey, Thomas Cunningham, **Aaron S Eisman**, Kathryn M Hardin, Robyn Farrel, John A Sbarbaro, Mark W Schoenike, Nicholas E Houstis, Aaron L Baggish, Ravi V Shah, Matthew Naylor, Rajeev Malhotra, Gregory D Lewis. Exercise Pulmonary Hypertension Predicts Clinical Outcomes in Patients With Dyspnea on Effort. *J Am Coll Cardiol* [Internet]. 2020 Jan 7;75(1):17–26. Available from: <http://dx.doi.org/10.1016/j.jacc.2019.10.048>

Jennifer E Ho, Emily K Zern, Luke Wooster, Cole S Bailey, Thomas Cunningham, **Aaron S Eisman**, Kathryn M Hardin, Giovanna A Zampierollo, Petr Jarolim, Paul Pappagianopoulos, Rajeev Malhotra, Matthew Naylor, Gregory D Lewis. Differential Clinical Profiles, Exercise Responses, and Outcomes Associated With Existing HFpEF Definitions. *Circulation*. 2019 Jul 30;140(5):353–65.

Aaron S Eisman, Ravi V Shah, Bishnu P Dhakal, Paul P Pappagianopoulos, Luke Wooster, Cole S Bailey, Thomas F Cunningham, Kathryn M Hardin, Aaron L Baggish, Jennifer E Ho, Rajeev Malhotra, Gregory D Lewis. Pulmonary Capillary Wedge Pressure Patterns During Exercise Predict Exercise Capacity and Incident Heart Failure. *Circulation: Heart Failure* May 2018.

Doreen DeFaria Yeh, Ada C Stefanescu Schmidt, **Aaron S Eisman**, John D Serfas, Mariam Naqvi, Mohamed A Youniss, Aaron D Ryfa, Asaad Khan, Lucy Safi, Sara R Tabtabai, Ami B Bhatt, Gregory D Lewis. Impaired Right Ventricular Reserve Predicts Adverse Cardiac Outcomes in Adults with Congenital Right Heart Disease. *BMJ: Heart*. (Response to reviewers submitted Feb 2018).

Aaron S Eisman, Rory B. Weiner, Elizabeth S. Chen, Paul C. Stey, Rishi K. Wadhera, Aaron P. Kithcart, Indra Neil Sarkar. An Automated System for Categorizing Transthoracic Echocardiography Indications According to the Echocardiography Appropriate Use Criteria. *AMIA Annu Symp Proc*. 2017.

Nick E Houstis, **Aaron S Eisman**, Paul P Pappagianopoulos, Luke Wooster, Cole S Bailey, Peter D Wagner, Gregory D Lewis. Exercise Intolerance in HFpEF: Diagnosing and Ranking its Causes Using Personalized O2 Pathway Analysis. *Circulation*. 2017 Oct 9.

Ravi V Shah, Venkatesh L Murthy, Laura A Colangelo, Jared Reis, Bharath Ambale Venkatesh, Ravi Sharma, Siddique A Abbasi, David C Goff, J Jeffrey Carr, Jamal S Rana, James G Terry, Claude Bouchard, Mark A Sarzynski, **Aaron S Eisman**, Tomas Neilan, Saumya Das, Michael Jerosch-Herold, Cora E Lewis, Mercedes Carnethon, Gregory D Lewis, Joao AC Lima. "Association of Fitness in Young Adulthood With Survival and Cardiovascular Risk: The Coronary Artery Risk Development in Young Adults (CARDIA) Study." *JAMA Internal Medicine*: (2016) 1-9.

Rajeev Malhotra, Bishnu P Dhakal, **Aaron S Eisman**, Paul P Pappagianopoulos, Ashley Dress, Rory B Weiner, Aaron L Baggish, Gregory D Lewis. Pulmonary Vascular Distensibility Predicts Pulmonary Hypertension Severity, Exercise Capacity, and Survival in Heart Failure. *Circ Heart Fail* [Internet]. 2016;9(6).

Ravi V Shah, Shingo Kato, Sebastien Roujol, Venkatesh Murthy, Steven Bellm, Abyaad Kashem, Tamer Basha, Jihye Jang, **Aaron S Eisman**, Warren J Manning, Reza Nezafat. "Native Myocardial T 1 as a Biomarker of Cardiac Structure in Non-Ischemic Cardiomyopathy." *The American Journal of Cardiology* (2016).

Luiza H Degani-Costa, Barbara Leverage, Subba R Digumarthy, **Aaron S Eisman**, R Scott Harris, Gregory D Lewis. "Pulmonary vascular response patterns during exercise in interstitial lung disease." *European Respiratory Journal* (2015): ERJ-01910-2014.

Bishnu P Dhakal, Rajeev Malhorta, Ryan M Murphy, Paul P Pappagianopoulos, Aaron L Baggish, Rory B Weiner, Nick E Houstis, **Aaron S Eisman**, Stacyann S Hough, Gregory D Lewis. "Mechanisms of exercise intolerance in heart failure with preserved ejection fraction: the role of abnormal peripheral oxygen extraction." *Circulation: Heart Failure* (2014): CIRCHEARTFAILURE. 114.001825.

Meagan M Wasfy, James Deluca, Brant Berkstresser, Kathryn E Ackerman, **Aaron S Eisman**, Gregory D Lewis, Adolph M Hutter, Rory B Weiner, Aaron L Baggish. "ECG findings in competitive rowers: normative data and the prevalence of abnormalities using contemporary screening recommendations." *British journal of sports medicine* (2014): bjsports-2014-093919.

Mindan K Sfakianos, **Aaron S Eisman**, Shannon D Gourley, William D Bradley, AJ Scheetz, Jeffrey Settleman, Jane R Taylor, Charlie R Greer, Anne Williamson, Anthony J Koleske. "Inhibition of Rho via Arg and p190RhoGAP in the postnatal mouse hippocampus regulates dendritic spine maturation, synapse and dendrite stability, and behavior." *The Journal of Neuroscience* 27.41 (2007): 10982-10992.

Aaron S Eisman and Monty Robson. "Lightcurve of asteroid (21652) 1999 OQ2." *Minor Planet Bulletin* 31 (2004): 84.

ABSTRACTS AND PRESENTATIONS

American Medical Informatics Association Symposium 2020, Virtual

Extracting Angina Symptoms from Clinical Notes Using Pre-Trained Transformer Architectures (Oral Paper Presentation, Nov 2020)

American Medical Informatics Association Symposium 2017, Washington DC

An Automated System for Categorizing Transthoracic Echocardiography Indications According to the Appropriate Use Criteria (Oral Paper Presentation, Nov 2017)

American Heart Association Scientific Sessions 2015, Orlando, FL

Exercise Pulmonary Capillary Wedge Pressure Patterns Predict Heart Failure Outcomes (Oral Abstract Presentation, Nov 2015)

American Heart Association Scientific Sessions 2014, Chicago, IL

Left Ventricular Mass Predicts Left Sided filling Pressures and Exercise Capacity in Patients with Preserved Left Ventricular Function and Normal Resting Hemodynamics (Poster, Nov 2014)

Pulmonary Arterial Pressure Recovery Patterns Reflect Right Ventricular Function and Pulmonary Vascular Reserve (Poster, Nov 2014)

Heart Failure Society of America 2014, Las Vegas, NV

Pulmonary Arterial Pressure Recovery Patterns Reflect Right Ventricular Function and Pulmonary Vascular Reserve (Poster, Sep 2014)

RESEARCH GRANTS

Brown Scholarly Concentration Summer Research Fellow (2016) - \$5,000

National Research Service Award, F30 (2020-2023) - \$149,100

REVIEW ACTIVITIES

North East Computational Health Summit Abstract Reviewer (2019)

AMIA Annual Symposium Reviewer (2019-2020)

Journal of Biomedical Informatics, Ad Hoc (2020)