Ryan Neff, PhD

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Education

ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI New York, NY
MD/PhD Candidate, Bin Zhang Lab Class of 2023
Working on multi-omics network modeling of Alzheimer's Disease subtypes, differential coexpression of molecular features in health and disease, and somatic mutational enrichment. PhD awarded 3/2021.

HARVARD UNIVERSITY Cambridge, MA
SB in Engineering Sciences (High Honors), Biomedical Engineering December 2013
Research Assistant (2011-2012) in Genomics and Bioinformatics Research at the Harvard-MIT Health Sciences and Technology of Harvard Medical School. Test Scores: MCAT: 38 (14 P, 12 B, 12 V); ACT: 36

Awards

MOUNT SINAI HEALTH HACKATHON, RARE DISEASES October 2018
Finalist, Demeter Health
Awarded $2500 for our precision diet and healthcare app to aid in the treatment of metabolic disease and food sensitivity.

MOUNT SINAI SINAIMEDMAKER CHALLENGE October 2016
Finalist, PT Partner
Awarded $3500 for our physical therapy tracking medical device and mobile app.

HARVARD INNOVATION CHALLENGE March 2011
Finalist, McKinley Grant for Innovation and Entrepreneurial Leadership
Awarded $10,000 for winning business plan in competition with more than 80 teams at Harvard and MIT.

Previous Work Experience

NATIONAL HUMAN GENOME RESEARCH INSTITUTE Bethesda, MD
Research Fellow, Dr. Gary Gibbons Lab Jan. 2014 – May 2015

- Improved the accuracy of next-generation sequencing by 0.5-5% in population-based studies of cardiovascular disease
- Jointly developed and administrating a $1.5M clinical research massively parallel computing system, including a novel clinical research database built with NoSQL.
- Re-engineered the common human reference genome and wrote new software in Python for population-based analysis

HARVARD BIOROBOTICS LABORATORY Cambridge, MA
Inventor, Steerable Cardiac Catheter Sept. 2012 – May 2013

- Developed a novel type of robotic catheter for more precise targeting in minimally invasive heart surgery, including ablation, biopsies, and valve replacement surgeries in Dr. Robert Howe's lab.

HARVARD BIODESIGN LABORATORY Cambridge, MA
Inventor, Soft Robotic Glove Jan. – May 2013

- Worked with a team of biomedical engineers to design, build, and test a new type of multi-segmented soft actuator for patients with hand disabilities as a result of injury, stroke, and muscular degeneration in Dr. Walsh's lab.

HARVARD COLLEGE ENGINEERING SOCIETY Cambridge, MA
Treasurer Fall 2010-2012

- Organized student events around engineering engagement around Harvard and balanced budget for organization
- Fostered innovative projects and trips including those to see industry leaders in healthcare, engineering, and aerospace

HARVARD ENGINEERS WITHOUT BORDERS Cambridge, MA
Clean Water Development Group 2010-2011

- Worked in a large team to design, build, and establish innovative renewable water purification systems and a business model to support it aimed at reducing the incidence of disease in communities in the Dominican Republic.

Technical Skills

Programming: Python, R, Java, C, MySQL/NoSQL Databases, Matlab, Perl, Javascript, Ruby, Rails, HTML5, CSS3
Design: Powerpoint, Excel, Word, Adobe Illustrator, InDesign, Photoshop, After Effects, Solidworks, AutoCAD, Sunstone

Selected Publications, Patents, and Abstracts

Chen Ming, Minghui Wang, Qian Wang, **Ryan Neff**, Erming Wang, Qi Shen, Joseph S. Reddy, Xue Wang, Mariet Allen, Nilüfer Ertekin-Taner, Philip L. De Jager, David A. Bennett, Vahram Haroutunian, Eric Schadt, Bin Zhang. Whole genome sequencing–based copy number variations reveal novel pathways and targets in Alzheimer's disease. Alzheimer's Dement. 2021; 1- 22. https://doi.org/10.1002/alz.12507

Emrin Horgusluoglu, **Ryan Neff**, Won-Min Song, Minghui Wang, Qian Wang, Matthias Arnold, Jan Krumsiek, Beatriz Galindo-Prieto, Chen Ming, Kwangsik Nho, Gabi Kastenmüller, Xianlin Han, Rebecca Baillie, Qi Zeng, Shea Andrews, Haoxiang Cheng, Ke Hao, Alison Goate, David A. Bennett, Andrew J. Saykin, Rima Kaddurah-Daouk, Bin Zhang, for the Alzheimer's Disease Neuroimaging Initiative (ADNI) , the Alzheimer Disease Metabolomics Consortium. Integrative metabolomics-genomics approach reveals key metabolic pathways and regulators of Alzheimer's disease. Alzheimer's Dement. 2021; 1- 19. https://doi.org/10.1002/alz.12468

Roland Friedel, Yong Huang, Minghui Wang, Shalaka Wahane, Mitzy Ríos de Anda, Lap Ho, Yuhuan Li, Sangjo Kang, **Ryan Neff**, Ana Kostic, Joseph Buxbaum, John Crary, Bin Zhang, Hongyan Zou. Regulation of cell distancing in peri-plaque glial nets by Plexin-B1 affects glial activation and amyloid compaction in Alzheimer's disease. 28 October 2021, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-967160/v1]

Yiyuan Xia, Qing Zhang, Gang Wu, Erming Wang, Minghui Wang, Fang Huang, Kuan Zeng, Sezen Vatansever, Lei Guo, **Ryan Neff**, Kaiwen Yu, Yuxin Li, Dan Ke, Qun Wang, Vahram Haroutunian, Junmin Peng, Jian-Zhi Wang, Rong Liu, Bin Zhang, Xiang Gao, Xiaochuan Wang. 14-3-3ζ Captures SET in the Cytoplasm, Mediating Tau Pathology and Cognitive Impairments, 02 August 2021, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-744907/v1]

Neff RA, Wang M, Vatansever S, Guo L, Ming C, Wang Q, Wang E, Horgusluoglu-Moloch E, Song W, Li A, Castranio EL, TCW J, Ho L, Goate A, Fossati V, Noggle S, Gandy S, Ehrlich ME, Katsel P, Schadt E, Cai D, Brennand KJ, Haroutunian V, Zhang B. Molecular subtyping of Alzheimer's disease using RNA sequencing data reveals novel mechanisms and targets. *Science Advances*, 2021 Jan 1;7(2):eabb5398, http://advances.sciencemag.org/content/7/2/eabb5398.abstract

Wang M, Li A, Sekiya M, Beckmann ND, Quan X, Schrode N, Fernando MB, Yu A, Zhu L, Cao J, Lyu L, Horgusluoglu E, Wang Q, Guo L, Wang Y, **Neff R**, Song W, Wang E, Shen Q, Zhou X, Ming C, Ho S-M, Vatansever S, Kaniskan HÜ, Jin J, Zhou M-M, Ando K, Ho L, Slesinger PA, Yue Z, Zhu J, Katsel P, Gandy S, Ehrlich ME, Fossati V, Noggle S, Cai D, Haroutunian V, Iijima KM, Schadt E, Brennand KJ, Zhang B. Transformative Network Modeling of Multi-omics Data

Reveals Detailed Circuits, Key Regulators, and Potential Therapeutics for Alzheimer's Disease. *Neuron*. 2020 Nov 24, https://doi.org/10.1016/j.neuron.2020.11.002

Wang M, Beckmann ND, Roussos P, Wang E, Zhou X, Wang Q, Ming C, **Neff RA**, Ma W, Fullard JF, Hauberg ME, Bendl J, Peters MA, Logsdon B, Wang P, Mahajan M, Mangravite LM, Dammer EB, Duong DM, Lah JJ, Seyfried NT, Levey AI, Buxbaum JD, Ehrlich M, Gandy S, Katsel P, Haroutunian V, Schadt E, Zhang B. "The Mount Sinai Cohort of Large-Scale Genomic, Transcriptomic and Proteomic Data in Alzheimer's Disease." *Scientific Data*, vol. 5, The Author(s), Sept. 2018, p. 180185, http://dx.doi.org/10.1038/sdata.2018.185.

Neff RA, Bar-Mashiah A, Chandrasekaran S, Chiang D, Thomas, D, Meah Y. "Design and Evaluation of an Affordable, Patient-Centered Telephony System for a Student-Run Free Clinic". SSRFC Conference 2018, University of Nebraska, Omaha, NE

Zilbermint M, Xekouki P, Faucz FR, Berthon A, Gkourogianni A, Schernthaner-Reiter MH, Batsis M, Sinaii N, Quezado MM, Merino M, Hodes A, Abraham SB, Libé R, Assié G, Espiard S, Drougat L, Ragazzon B, Davis A, Gebreab SY, **Neff R**, Kebebew E, Bertherat J, Lodish MB, Stratakis CA. Primary Aldosteronism and ARMC5 Variants. J Clin Endocrinol Metab. 2015 Jun;100(6):E900-9. doi: 10.1210/jc.2014-4167.

Alignment to an Ancestry Specific Reference Genome Discovers Additional Variants Among 1000 Genomes ASW Cohort. **Neff RA**, Vargas J, Gibbons GH, Davis AR. Cardiovascular Disease Section, GMCID, National Human Genome Research Institute, Bethesda, MD. Platform Presentation, American Society for Human Genetics Conference. 2014 October 19.

US 10,184,500, WO 2015066143 A1. Galloway K, Walsh C, Holland D, Polygerinos P, Clites T, Neff RA, et al inventors. "Multi-segment reinforced actuators and applications." Harvard University, assignee. 2013 October 29.

US Patent Nos. 9,870,003, 8,930,059, 8,532,862. Neff RA. "Driverless vehicle."

US Patent No. 8,311,730. **Neff RA**. "Vehicle Position Determination System"

Maeder-York, P, Clites T, Boggs E, **Neff R**, Polygerinos P, Holland D, Stirling L, Galloway K, Wee C, Walsh C. Biologically Inspired Soft Robot for Thumb Rehabilitation. J. Med. Devices. 2014 April 28.

Kurek KC, et al. Somatic Mosaic Activating Mutations in PIK3CA Cause CLOVES Syndrome. Am Jol Hum Gen 2012 Jun 8 90;6;1108-1115

Bellapianta J, Swartz F, Lisella J, Czajka J, **Neff R**, Uhl R. Randomized prospective evaluation of injection techniques for the treatment of lateral epicondylitis. Orthopedics. 2011 Nov 9;34(11)

US Patent No. 6,850,170. **Neff RA**. "On-board Vehicle System and Method for Receiving and Indicating Driving-Related Signals"