

# Ryan Neff

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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.

### 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

### Treasurer

Cambridge, MA

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, MySQL/NoSQL Databases, Matlab, Perl, C, Javascript, Ruby, Rails, HTML5, CSS3, AJAX

**Design:** Powerpoint, Excel, Word, Adobe Illustrator, InDesign, Photoshop, After Effects, Solidworks, AutoCAD, Sunstone

### Selected Publications, Patents, and Abstracts

**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”