Ryan Neff, MD, PhD

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Education

MOUNT SINAI HOSPITAL New York, NY
Internal Medicine Residency Training Program 7/1/2023-6/30/2026
Licensed PGY-2 resident, completed USMLE. Anticipated Cardiology to EP Fellowship.

ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI New York, NY
MD/PhD in Genetics and Genomic Sciences, Bin Zhang Lab 6/24/2015-5/11/2023
Worked on multi-omics network modeling of Alzheimer's Disease subtypes, differential coexpression of molecular features in health and disease, and somatic mutational enrichment of breast cancer, leading to $4.1 million in new NIH funding for the lab. PhD awarded 5/2021.

NATIONAL HUMAN GENOME RESEARCH INSTITUTE Bethesda, MD
IRTA Post-Baccalaureate Program, Dr. Gary Gibbons (NHLBI) Lab 1/4/2014–5/31/2015
- Improved the accuracy of next-generation sequencing by 0.5-5% in a population-based study 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 UNIVERSITY Cambridge, MA
SB in Engineering Sciences (High Honors), Biomedical Engineering 8/20/2009-12/17/2013
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

Current and Prior Research and Extracurricular Experiences

LABORATORY OF DR. ABHISHEK MAAN New York, NY
Research Associate 3/2024-Current
- Working on several atrial fibrillation, VF, and ablation projects including factorization and dimensionality reduction of EKGs towards predicting ablation success and outcomes and large genomic studies

EAST HARLEM HEALTH OUTREACH PARTNERSHIP New York, NY
Technology Chair 9/2016-8/2019
- Lead a technology development team to build out clinical solutions for EHHOP, including a Python and Web-based telephony system

HARVARD BIOROBOTICS LABORATORY Cambridge, MA
Inventor, Steerable Cardiac Catheter 9/1/2012 – 5/31/2013
- 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 1/1/2013-5/31/2013
- 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. Conor Walsh's lab.

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.

Technical Skills

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

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

Neff, R. A., Bosch-Gutierrez, A., Sun, Y., Katsyv, I., Song, W. M., Wang, M., Walsh, M. J., & Zhang, B. 2023. Dysfunction of ubiquitin protein ligase MYCBP2 leads to cell resilience in human breast cancers. NAR Cancer, 5(3). https://doi.org/10.1093/NARCAN/ZCAD036

Huang, Y., Wang, M., Ni, H., Zhang, J., Li, A., Hu, B., Junqueira Alves, C., Wahane, S., Rios de Anda, M., Ho, L., Li, Y., Kang, S., **Neff, R.,** Kostic, A., Buxbaum, J. D., Crary, J. F., Brennand, K. J., Zhang, B., Zou, H., & Friedel, R. H. (2024). Regulation of cell distancing in peri-plaque glial nets by Plexin-B1 affects glial activation and amyloid compaction in Alzheimer's disease. Nature Neuroscience 2024 27:8, 27(8), 1489–1504. https://doi.org/10.1038/s41593-024-01664-w

US Patent 202063104416P, WO2022087460A1. 2022 April 28. Bin Zhang, **Ryan A Neff**, Vahram Haroutunian, Lap Ho, Xianxiao Zhou. Methods for Identifying and Targeting the Molecular Subtypes of Alzheimer's Disease.

Wang, Y.A., **Neff, R.,** Song, W.-m., Zhou, X., Vatansever, S., Walsh, M.J., Chen, S.-H. and Zhang, B. 2023. Multi-omics-based analysis of high grade serous ovarian cancer subtypes reveals distinct molecular processes linked to patient prognosis. FEBS Open Bio, 13: 617-637. https://doi.org/10.1002/2211-5463.13553

Bhavana Palakurthi, Ian H. Guldner, Xiyu Liu, Anna K. Martino, Qingfei Wang, Shaneann Fross, **Ryan A. Neff**, Samantha M. Golomb, Erin N. Howe, Siyuan Zhang. Maximizing the Anti-tumor Potential of Immune Checkpoint Blockade through Modulation of Myeloid-specific CXCL16 and STAT1 Signaling. bioRxiv 2022.03.28.485781; doi: https://doi.org/10.1101/2022.03.28.485781

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, Alzheimer's Dement. 2021. DOI: 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, Research Square; 2021. DOI: 10.21203/rs.3.rs-744907/v1.

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, 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.

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

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

US Patent 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"