

Stanford



Neal Amin

Bio

BIO

Dr. Amin is a physician-scientist researcher in the Department of Psychiatry at Stanford University. Dr. Amin received a Bachelor of Arts from Columbia College, Columbia University, and earned MD and PhD degrees in the MSTP at the University of California, San Diego. With his graduate mentor Samuel L. Pfaff, PhD, at the Salk Institute for Biological Studies in La Jolla, CA, he uncovered post-transcriptional, RNA regulatory pathways that are remarkably cell type-specific in motor neurons and are essential for mammalian life (Amin et al, Science 2015; Amin et al, Neuron 2021). He completed psychiatry residency training in the Research Track at Stanford University and postdoctoral studies with Sergiu P. Pasca at Stanford University where he developed human stem cell-derived brain organoid technology, enabling the ability to model the immense neurocellular diversity of the human brain and factors affecting stem cell-derived neuronal maturation (Amin and Pasca, Neuron, 2018; Amin*, Kelley* et al, bioRxiv, 2024; Onesto*, Amin* et al, bioRxiv, 2024). The Amin Lab at Stanford University investigates RNA regulatory mechanisms affecting human brain development and the emergence of neuropathology towards the development of novel therapeutics. His work is funded by the NINDS/NIH, Deeda Blair Research Initiative, and the Brain and Behavior Research Foundation. Dr. Amin's research leverages his unique background as a board-certified, practicing Stanford physician and researcher with 20 years of bench research experience spanning mouse genetics, human neuropathology, advanced stem cell models of the brain, and cell type-specific RNA processing pathways.

ACADEMIC APPOINTMENTS

- Member, Wu Tsai Neurosciences Institute

PROFESSIONAL EDUCATION

- Board Certification, American Board of Psychiatry and Neurology , Psychiatry
- Residency, Stanford University , Psychiatry
- PhD, UC San Diego , Biomedical Sciences
- MD, UC San Diego
- BA, Columbia University, Columbia College

Publications

PUBLICATIONS

- **Midline Assembloids Reveal Regulators of Human Axon Guidance.** *bioRxiv : the preprint server for biology*
Onesto, M. M., Amin, N. D., Pan, C., Chen, X., Reis, N., Valencia, A. M., Hudacova, Z., McQueen, J. P., Tessier-Lavigne, M., Pa#ca, S. P. 2024
- **Single-cell transcriptomic landscape of the developing human spinal cord.** *Nature neuroscience*
Andersen, J., Thom, N., Shadrach, J. L., Chen, X., Onesto, M. M., Amin, N. D., Yoon, S. J., Li, L., Greenleaf, W. J., Müller, F., Pa#ca, A. M., Kaltschmidt, J. A., Pa#ca, et al

2023

- **Generating human neural diversity with a multiplexed morphogen screen in organoids** *bioRxiv*
Amin, N. D., Kelley, K. W., Hao, J., Narazaki, G., Li, T., McQueen, P., Kulkarni, S., Pavlov, S., Pasca, S. P.
2023
- **Motor neurons use push-pull signals to direct vascular remodeling critical for their connectivity** *NEURON*
Martins, L. F., Brambilla, I., Motta, A., de Pretis, S., Bhat, G., Badaloni, A., Malpighi, C., Amin, N. D., Imai, F., Almeida, R. D., Yoshida, Y., Pfaff, S. L., Bonanomi, et al
2022; 110 (24): 4090-+
- **Modulating miR-218 in Human Motor Neurons Using Assembloids**
Amin, N., Kulkarni, S., Pasca, S.
WILEY.2022: S168
- **Maturation and circuit integration of transplanted human cortical organoids.** *Nature*
Revah, O., Gore, F., Kelley, K. W., Andersen, J., Sakai, N., Chen, X., Li, M. Y., Birey, F., Yang, X., Saw, N. L., Baker, S. W., Amin, N. D., Kulkarni, et al
2022; 610 (7931): 319-326
- **Mouse embryo models built from stem cells take shape in a dish.** *Nature*
Amin, N. D., Pasca, S. P.
2022; 610 (7930): 39-40
- **Detecting microRNA-mediated gene regulatory effects in murine neuronal subpopulations.** *STAR protocols*
Amin, N. D., Senturk, G., Hayashi, M., Driscoll, S. P., Pfaff, S. L.
2022; 3 (1): 101130
- **A hidden threshold in motor neuron gene networks revealed by modulation of miR-218 dose.** *Neuron*
Amin, N. D., Senturk, G., Costaguta, G., Driscoll, S., O'Leary, B., Bonanomi, D., Pfaff, S. L.
2021
- **Conserved genetic signatures parcellate cardinal spinal neuron classes into local and projection subsets.** *Science (New York, N.Y.)*
Osseward, P. J., Amin, N. D., Moore, J. D., Temple, B. A., Barriga, B. K., Bachmann, L. C., Beltran, F., Gullo, M., Clark, R. C., Driscoll, S. P., Pfaff, S. L., Hayashi, M.
2021; 372 (6540): 385-393
- **Neuronal defects in a human cellular model of 22q11.2 deletion syndrome.** *Nature medicine*
Khan, T. A., Revah, O. n., Gordon, A. n., Yoon, S. J., Krawisz, A. K., Goold, C. n., Sun, Y. n., Kim, C. H., Tian, Y. n., Li, M. Y., Schaepe, J. M., Ikeda, K. n., Amin, et al
2020
- **Generation of Functional Human 3D Cortico-Motor Assembloids.** *Cell*
Andersen, J. n., Revah, O. n., Miura, Y. n., Thom, N. n., Amin, N. D., Kelley, K. W., Singh, M. n., Chen, X. n., Thete, M. V., Walczak, E. M., Vogel, H. n., Fan, H. C., Pasca, et al
2020
- **Building Models of Brain Disorders with Three-Dimensional Organoids** *NEURON*
Amin, N. D., Pasca, S. P.
2018; 100 (2): 389-405
- **Speed and segmentation control mechanisms characterized in rhythmically-active circuits created from spinal neurons produced from genetically-tagged embryonic stem cells** *ELIFE*
Sternfeld, M. J., Hinckley, C. A., Moore, N. J., Pankratz, M. T., Hilde, K. L., Driscoll, S. P., Hayashi, M., Amin, N. D., Bonanomi, D., Gifford, W. D., Sharma, K., Goulding, M., Pfaff, et al
2017; 6
- **Loss of motoneuron-specific microRNA-218 causes systemic neuromuscular failure** *SCIENCE*
Amin, N. D., Bai, G., Klug, J. R., Bonanomi, D., Pankratz, M. T., Gifford, W. D., Hinckley, C. A., Sternfeld, M. J., Driscoll, S. P., Dominguez, B., Lee, K., Jin, X., Pfaff, et al
2015; 350 (6267): 1525-1529

- **Chemical scaffolds with structural similarities to siderophores of nonribosomal peptide-polyketide origin as novel antimicrobials against *Mycobacterium tuberculosis* and *Yersinia pestis*** *BIOORGANIC & MEDICINAL CHEMISTRY LETTERS*

Ferreras, J. A., Gupta, A., Amin, N. D., Basu, A., Sinha, B. N., Worgall, S., Jayaprakash, V., Quadri, L. N.
2011; 21 (21): 6533–37