

Sameer Aryal

CONTACT INFORMATION	Stanley Center for Psychiatric Research Broad Institute of MIT and Harvard 75 Ames St Cambridge, MA 02142	<i>Phone:</i> (413) 347-9726 <i>E-mail:</i> sameer.aryal@gmail.com <i>LinkedIn:</i> https://www.linkedin.com/in/sameer-aryal-nyu/ <i>Website:</i> www.sameeraryal.com
RESEARCH INTERESTS	Genome-scale neurogenetics; high-throughput examination of the mechanisms of gene expression in neural systems.	
EDUCATION	New York University , New York, NY Doctor of Philosophy, Basic Medical Science, August 2013 - May 2020 <ul style="list-style-type: none">• Dissertation: “Molecular and computational examination of <i>de novo</i> protein synthesis in fragile X syndrome”• Advisor: Eric Klann, Ph.D.• Cumulative GPA: 3.97/4.0 Williams College , Williamstown, MA Bachelor of Arts, Biology (honors) and Economics, September 2008 - June 2012 <ul style="list-style-type: none">• Dissertation: “The role of DopR neuronal circuits in regulating endogenous arousal in <i>D. melanogaster</i>”• Advisor: Tim Lebestky, Ph.D.• Cumulative GPA: 3.57/4.0; Biology: 3.63; Economics: 3.67	
RESEARCH EXPERIENCE	Broad Institute of MIT and Harvard , Cambridge, MA <i>Postdoctoral Associate</i> Oct 2020 - present I am examining molecular and functional alterations in the synapses of multiple mouse models of schizophrenia, bipolar disorder, and autism spectrum disorders using molecular, genomic, and computational approaches. I am advised by Morgan Sheng, M.D., Ph.D. New York University Center for Neural Science , New York, NY <i>Graduate Research Assistant</i> June 2014 - June 2020 Developed, implemented, and analyzed the results of various molecular and genome-wide assays, including ribosome profiling (Ribo-Seq) and translating ribosome affinity purification (Trap-Seq), to quantitatively determine the mechanistic basis of elevated mRNA translation in the brain of a mouse model of fragile X syndrome. Also developed a novel assay to measure the rate of ribosome translocation in primary neurons. A*STAR-Duke-NUS Neuroscience Research Partnership , Singapore <i>Research Assistant</i> Aug 2012 - May 2013 Wrote MATLAB scripts to analyze <i>D. melanogaster</i> motion-tracking datasets. Also authored a MATLAB library to visualize biological data via ‘estimation plots,’ which emphasize effect sizes rather than p-values. Won the Singapore International Pre-Graduate Award (SIPGA) to carry out this research in the Adam Claridge-Chang laboratory. Williams College , Williamstown, MA <i>Honors Student</i> Sept 2011 - May 2012 Investigated which neuronal circuits regulate arousal, and how they are connected, in the <i>D. melanogaster</i> brain. Conditionally activated specific circuits in the fly brain by expressing the temperature-gated	

Transient Receptor Potential A1 (trpA1) channels in different subsets of neurons and then monitored the flies' behavioral phenotypes through sleep and locomotor assays.

PUBLICATIONS

1. **Aryal, S.**, Longo, F., Klann, E. Genetic removal of p70 S6K1 corrects coding sequence length-dependent alterations in mRNA translation in fragile X syndrome mice. *Proceedings of the National Academy of Sciences of the United States of America*. 2021.
2. Longo F., Mancini M., Ibraheem P.L., **Aryal S.**, Mesini C., Patel J.C., Penhos E., Rahman N., Donohue M., Santini E., Rice M.E., Klann E. Cell-type-specific disruption of PERK-eIF2 α signaling in dopaminergic neurons alters motor and cognitive function. *Molecular Psychiatry*. 2021.
3. Ho, J., Tumkaya, T., **Aryal, S.**, Choi, H., Claridge-Chang, A. Moving beyond P values: data analysis with estimation graphics. *Nature Methods*. 2019.
4. Bowling, H., Bhattacharya, A., Zhang, G., [et al., including **Aryal, S.**], Klann, E. Altered steady state and activity-dependent de novo protein expression in fragile X syndrome. *Nature Communications*. 2019.
5. **Aryal, S.**, Klann, E. Turning up translation in fragile X syndrome. *Science*. 2018.
6. Mohammad, F., **Aryal, S.**, Ho, J., Stewart, J.C., Norman, N.A., Tan, T.L., Eisaka, A., Claridge-Chang, A. Ancient anxiety pathways influence Drosophila defence behaviors. *Current Biology*. 2016.

PAPERS IN PREPARATION

1. **Aryal S.**, Bonanno K., Song B., Mani D.R., Keshishian H., Carr S., Sheng M., Dejanovic B. Prefrontal cortex synaptic proteome changes in schizophrenia and bipolar disorder.
2. Longo F., **Aryal S.**, Anastasiades P., Baimel C., Maltese M., Albanese F., Zhu J., Santini E., Tritsch N., Carter A., Klann E. Selective disruption of cortico-striatal circuitry results in repetitive and perseverative behaviors in fragile X syndrome model mice.

HONORS AND AWARDS

- Awarded a *registration and travel scholarship* to attend the 2017 Summer Institute in Statistics for Big Data at University of Washington, Seattle. *April 2017*
- Inducted into *Sigma Xi* Scientific Research Society. *June 2012*
- Awarded *Robert L Gaudino Fellowship* at Williams College, MA to conduct independent Economics research on healthcare access in rural Nepal. *January 2010*
- Awarded *Brilliance in Nepal* by the British Council in Kathmandu for securing the highest marks in University of Cambridge Advanced-Level Biology examinations in entire Nepal in the May/June 2007 session. *April 2008*
- Graduated *valedictorian* from Budhanilkantha School, the national school of Nepal. *May 2007*

CONFERENCE
PRESENTATIONS

- *Invited speaker*, Nanosymposium on “Neurodevelopmental Disorders - Mechanisms.” Society for Neuroscience Annual Meeting. 2017.
- *Invited speaker*, Annual Molecular Pharmacology Retreat. Sackler Institute at NYU School of Medicine. 2017.
- Presented posters describing my graduate research at:
 - Society for Neuroscience Annual Meeting. 2015, 2016, and 2018.
 - Molecular and Cellular Cognition Society Annual Meeting. 2015, 2016, and 2018.
 - Brains and Behavior: Order and Disorder in the Nervous System. Cold Spring Harbor Laboratories Symposium in Quantitative Biology. 2018.
 - RNA Therapeutics: From Base Pairs to Bedsides Symposium. 2018.

ADDITIONAL
QUALIFICATIONS

- *Intern* at the Office of Industrial Liaison, NYU Langone Health. Created a business plan for an NYU-developed technology by researching the technology, identifying its competitive advantages, analyzing the market for the technology, and describing the business model for the company. *July - Nov 2017*
- *Graduate Teaching Assistant* to Dr. Angus Wilson in the seminar “Introduction to Research” at the Sackler Institute at NYU School of Medicine. *Fall 2017*
- *Peer tutor* for beginner and intermediate Macroeconomics and Econometrics at Williams College, MA. *2010-2012*

SKILLS

- Programming languages: Python, R, MATLAB, Shell scripting (Bash), SQL.
- Applications: Git, \LaTeX ; common database, spreadsheet, and presentation software.
- Environments: High Performance Computing (SGE/Slurm), Unix/Linux, Windows.
- Laboratory techniques : primary neuron culture, transgene delivery with AAV and lentiviral vectors, in vivo pharmacology in mice, nucleic acid isolation, high-throughput library preparations, qPCR, immuno-precipitation, western blotting, immuno-fluorescence, confocal microscopy, immunological assay development.