

# Benjamin Lipkin

Curriculum Vitae

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## Contact:

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## Education:

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2016 – 2020	University of Michigan, Ann Arbor, MI  Degree: B.Sc. Neuroscience, High Honors Concentration: Computation & Cognition Thesis: Decoding object color binding using multivariate pattern analysis. Advisor: Dr. David Brang, PhD.
2012 – 2016	Bronx High School of Science, Bronx, NY

## Research:

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2020 – Present	Fedorenko Lab, MIT, Cambridge, MA (full-time)  Worked on a wide variety of projects using neuroimaging, corpus analysis, and computational modeling to investigate the neural representations and computations underlying language and other hierarchically structured processing in the human brain and in SOTA deep learning models. Developed software along these goals using primarily Python, MATLAB, and R, among other tools.
2018 – 2020	Brang Lab, University of Michigan, Ann Arbor, MI (part-time + summer)  Processed and analyzed intraoperative Electrocorticographic (ECoG) data from epilepsy and tumor patients to investigate articulation network dynamics and organization. Collected and analyzed fMRI data to assess predictive coding of visual information. Assisted in the creation, development, and maintenance of laboratory signal processing, statistical inference, and machine learning pipelines in MATLAB and Python.
2016 – 2018	Becker Lab, University of Michigan, Ann Arbor, MI (part-time + summer)  Carried out behavioral experiments in rats investigating estradiol-mediated modulation of basal ganglia dopamine circuitry during psychostimulant

drug administration. Assisted in animal surgery, immunohistochemistry, and statistical data analysis.

2014 – 2015

Kandel Lab, Columbia University, New York, NY (summer)

Used SDS-PAGE to screen compounds for their effects on the aggregation of RNA binding protein TIA-1 in vitro and in COS-7 cells. Analyzed FRET data to investigate stress granule formation.

### Manuscripts:

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- 2021 **Lipkin B\***, Srikant S\*, Ivanova A, Fedorenko E. (in prep.). BrainCode: An investigation of human and artificial neural representations of computer programs. <https://github.com/benlipkin/braincode>
- 2021 Regev T\*, **Lipkin B\***, Boebinger D, Paunov A, Norman-Haignere S, Kanwisher N, Fedorenko E. (in prep.). Preserved functional organization of human auditory cortex in individuals missing temporal lobe from birth.
- 2021 **Lipkin B\***, Affourtit J\*, Small H, Mineroff Z, Nieto-Castañón A, Fedorenko E. (in prep.). In defense of individual-level functional neural markers: Evidence from large-scale fMRI datasets of functional ‘localizers’ for the language and the Multiple Demand networks.
- 2021 Malik-Moraleda S, Cucu T, **Lipkin B**, Fedorenko, E. (under review). The domain-general Multiple Demand system is more active in bilinguals than monolinguals during executive processing.
- 2021 Aabedi A\*, **Lipkin B\***, Kaur J, Kakaizada S, Reihl S, Young JS, Lee AT, Krishna S, Chang EF, Brang D, Hervey-Jumper SL. (under review). Functional alterations in cortical processing of speech in glioma-infiltrated cortex. <https://www.biorxiv.org/content/10.1101/2021.05.14.444263v1>
- 2021 Aabedi A, **Lipkin B**, Young JS, Krishna S, Kakaizada S, Kaur J, Berger M, Brang D, Hervey-Jumper SL. (2021). Spectro-temporal encoding of speech responses in glioma-infiltrated cortex. *Journal of Neurosurgery*, 132(2).

### Talks:

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- 2020 Aabedi A, **Lipkin B**, Valdivia C. The neural encoding of speech errors in patients with perisylvian brain tumors. Berkeley Phonetics and Phonology Forum, Berkeley, CA.

### Posters:

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- 2019 **Lipkin B**, Plass J, Kakaizada S, Valdivia C, Sagher O, Hervey-Jumper SL, Brang D. Electrocorticographic recordings enable intraoperative language network mapping. Society for Neuroscience, Chicago, IL
- 2019 **Lipkin B**, Denney CJ, Plass J, Weissman DH, Sagher O, Hervey-Jumper SL, Brang D. Electrocorticographic recordings enable intraoperative

	language network mapping. MCubed Research Conference, University of Michigan, Ann Arbor, MI.
2018	Quigley JA, <b>Lipkin B</b> , Lalani LK, Becker JB. G-protein coupled estradiol receptor 1 activation regulates drug preference and dopamine release in male rats. Society for Neuroscience, San Diego, CA.
2018	Quigley JA, Lalani LK, <b>Lipkin B</b> , Becker JB. Effects of ICI 182,780 on preference for cocaine in male rats. International Behavioral Neuroscience Society, Boca Raton, FL.

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#### **Awards:**

2016 – 2020	University Honors.
2019	MCubed Scholars Research Fellowship.
2016	New York City Science & Engineering Fair Finalist.

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#### **Volunteer:**

2018	FEMMES Workshop Volunteer. University of Michigan, Ann Arbor, MI.
2017	Laboratory Tour Volunteer. University of Michigan, Ann Arbor, MI.
2016	Patient Care Volunteer. Eisenhower Center for TBI, Ann Arbor, MI.

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#### **Affiliations:**

2020 – Present	Society for the Neurobiology of Language (SNL).
2019 – Present	Cognitive Neuroscience Society (CNS).
2018 – Present	Society for Neuroscience (SfN).

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#### **Relevant Coursework & Technical Experience:**

Mathematics	Vector Calculus, Linear Algebra, Differential Equations, Probability
Computer Science	Data Structures & Algorithms, Software Engineering, Machine Learning
Engineering	Dynamic Systems & Control, Signal Processing, Convex Optimization
Languages	Python, MATLAB, R, Bash/Zsh, Julia, C++, HTML/CSS, SQL
Key Software	PyTorch, Tensorflow, Scikit-Learn, EEGLAB, SPM, Freesurfer

## References:

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