

Assistant Professor, Columbia University
Department of Neuroscience
Zuckerman Mind Brain Behavior Institute
3227 Broadway, L6-005, New York, NY, 10027, USA

Phone 212.853.0285
Email yasmine.shamayleh@columbia.edu
Web <https://el-shamayleh.zi.columbia.edu>

AREAS OF EXPERTISE

- I. Neural mechanisms of visual shape processing in primates
- II. Optogenetic manipulations of neural activity in primates

EDUCATION

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| New York University New York, NY
PhD – Neural Science | 2003–2009 |
| University of Pennsylvania Philadelphia, PA
BA – Biological Basis of Behavior; Magna Cum Laude | 1999–2003 |

POSITIONS

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| Columbia University New York, NY
Assistant Professor – Department of Neuroscience and Zuckerman Institute | 2019– |
| University of Washington Seattle, WA
Postdoctoral Fellow – Department of Physiology & Biophysics
Laboratory of Gregory D. Horwitz, PhD | 2014–2019 |
| University of Washington Seattle, WA
Postdoctoral Fellow – Department of Biological Structure
Laboratory of Anitha Pasupathy, PhD | 2010–2014 |
| New York University New York, NY
Postdoctoral Fellow – Center for Neural Science
Laboratory of J. Anthony Movshon, PhD | 2009–2010 |
| New York University New York, NY
Doctoral Candidate – Center for Neural Science
Laboratory of J. Anthony Movshon, PhD | 2004–2009 |

HONORS & AWARDS

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| National Science Foundation CAREER Award | 2022 |
| Kavli-Grossman Scholar at Columbia University | 2021 |
| National Eye Institute Early Career Scientist Travel Award | 2019 |
| McKnight Foundation for Neuroscience Allison Doupe Postdoctoral Fellow | 2018 |
| University of Washington Postdoctoral Mentoring Award Nominee | 2014 |
| Computational and Systems Neuroscience Meeting ‘Spotlight Presentation’ | 2009 |
| New York University Graduate School Teaching Fellow | 2006–2008 |
| New York University Dean’s Dissertation Writing Award in the Natural/Life Sciences | 2008 |
| New York University Dean’s Outstanding Teaching Award in the Natural/Life Sciences | 2006 |
| New York University Graduate School of Arts & Sciences Travel Award | 2005 |
| University of Pennsylvania Summer Undergraduate Research Fellowship | 2002 |

INVITED SEMINARS & WORKSHOPS

Columbia University, Zuckerman Institute "Giving Day"	2020
National Institutes of Health / National Institute of Mental Health, Bethesda, MD	2018
National Institutes of Health / National Eye Institute, Bethesda, MD	2018
Columbia University, Department of Neuroscience, New York, NY	2018
International Brain Research Organization Middle East & North Africa Conference, Jordan	2017
University of Washington, Physiology & Biophysics Postdoctoral Seminar Series, Seattle, WA	2017
Université Paris Descartes, Neurobridges Workshop, Paris, France	2015
University of Washington, Physiology & Biophysics Postdoctoral Seminar Series, Seattle, WA	2015
University of Washington, Computational Neuroscience Symposium, Seattle, WA	2011
State University of New York, College of Optometry, New York, NY	2010
University of Texas at Austin, Center for Perceptual Systems, Austin, TX	2009
Johns Hopkins University, Mind/Brain Institute, Baltimore, MD	2009
University of Washington, Department of Biological Structure, Seattle, WA	2009

TEACHING AT COLUMBIA

Seminar in Visual & Oculomotor Neurophysiology (NBHVG6020; Ferrera)	2019
Nanocourse on Presentation Skills for Neuroscience (GR7020 ; Hengst)	2021
Introduction to Neuroscience (NSBV 10001; White)	2022

SERVICE AT COLUMBIA

PhD Program in Neurobiology & Behavior (NBB)

Faculty Advisor for New Student Orientation ("Bootcamp")	2021
Bootcamp talk	2020, 2021
Admissions Committee Member (Systems Track)	2019–
Thesis committee member (Michael Cohanpour; Gottlieb lab)	2019–
Thesis committee member (Naveen Sendhilnathan; Goldberg lab)	2019–2021

Zuckerman Mind Brain Behavior Institute

"Innovation Scholars" committee member	2021–
Columbia Neuroscience Seminar Selection committee	2020–
Faculty Advisor for the "Postdoctoral Program"	2020–
Academic Bootcamp for Postdocs (Giving an effective chalk talk)	2020

Department of Neuroscience

Faculty Mentoring Committee Member (co-chair)	2021–
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Other

Biomedical Engineering Rising Stars Workshop (Giving an effective chalk talk)	2020
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SERVICE BEYOND COLUMBIA

New York University Leon Levy Symposium Panel (Starting a research lab)	2021
New York University Career Panel for Postdocs (Career paths for STEM PhDs)	2021
University of Washington Career Panel for Postdocs (Giving an effective chalk talk)	2020
University of Washington Career Panel for Postdocs (Top myths about getting a scientific job)	2020

Cerebral Cortex	2013–
eLife	2020–
Journal of Neurophysiology	2012–
Journal of Neuroscience	2012–
Journal of Vision	2017–
Nature Communications	2018–
Nature Communications Biology	2020–
PLOS Computational Biology	2015–
PLOS ONE	2010–
PNAS	2021–

PUBLICATIONS

Jeurissen D, Shushruth S, **EI-Shamayleh Y**, Horwitz GD, Shadlen MN [2021]. Deficits in decision-making induced by parietal cortex inactivation are compensated at two time scales. *Neuron*, in press.

De A, **EI-Shamayleh Y**, Horwitz GD [2020]. Fast and Reversible Neural Inactivation in Macaque Cortex by Optogenetic Stimulation of GABAergic neurons. *eLife*, 9:e52658.

EI-Shamayleh Y, Horwitz GD [2019]. Primate optogenetics: progress and prognosis. *PNAS*, 116(52): 26195-2620.

Fetsch CR, Odean NN, Jeurissen D, **EI-Shamayleh Y**, Horwitz GD, Shadlen MN [2018]. Focal optogenetic suppression in macaque area MT biases direction discrimination and decision confidence, but only transiently. *eLife*, 7:e36523

Pasupathy A, **EI-Shamayleh Y**, Popovkina DV [2018]. Visual shape and object perception. In *Oxford Research Encyclopedia of Neuroscience*. Ed. S. Murray Sherman. New York: Oxford University Press. 10.1093/acrefore/9780190264086.013.75.

EI-Shamayleh Y, Kojima Y, Soetedjo R, Horwitz GD [2017]. Selective optogenetic control of Purkinje cells in monkey cerebellum. *Neuron*, 95: 51-62.

Fyall AM*, **EI-Shamayleh Y***, Choi H, Shea-Brown E, Pasupathy A [2017]. Dynamic representation of partially occluded objects in primate prefrontal and visual cortex. *eLIFE*, 6:e25784. *Authors contributed equally.

Mendoza SM*, **EI-Shamayleh Y***, Horwitz GD [2017]. AAV-mediated delivery of optogenetic constructs to the macaque brain triggers humoral immune responses. *Journal of Neurophysiology*, 117[5]:2004-2013. *Authors contributed equally.

Galvan A, Stauffer WR, Acker L, **EI-Shamayleh Y**, Inoue K, Ohayon S, Schmid MC [2017]. Nonhuman Primate Optogenetics: Recent Advances and Future Directions. *Journal of Neuroscience*, 37[45]:10894-10903.

EI-Shamayleh Y, Ni AM, Horwitz GD [2016]. Strategies for targeting primate neural circuits with viral vectors. *Journal of Neurophysiology*, 116[1]:122–34.

EI-Shamayleh Y, Pasupathy A [2016]. Contour curvature as an invariant code for objects in visual area V4. *Journal of Neuroscience*, 36[20]:5532-5543.

Kumbhani RD, **EI-Shamayleh Y**, Movshon JA [2015]. Temporal and spatial limits of pattern motion sensitivity in macaque MT neurons. *Journal of Neurophysiology*, 113[7]:1977-88.

Kosai Y*, **EI-Shamayleh Y***, Fyall A, Pasupathy A [2014]. The role of visual area V4 in the discrimination of partially occluded shapes. *Journal of Neuroscience*, 34[25]:8570-8584. *Authors contributed equally.

EI-Shamayleh Y, Kumbhani RD, Dhruv NT, Movshon JA [2013]. Visual response properties of V1 neurons projecting to V2 in macaque. *Journal of Neuroscience*, 33[42]:16594-605.

EI-Shamayleh Y, Movshon JA [2011]. Neuronal responses to texture-defined form in macaque visual area V2. *Journal of Neuroscience*, 31[23]:8543-55.

EI-Shamayleh Y, Movshon JA, Kiorpes L [2010]. Development of sensitivity to visual texture modulation in macaque monkeys. *Journal of Vision*, 10[11]:11.

EI-Shamayleh Y, Kiorpes L, Kohn A, Movshon JA [2010]. Visual motion processing by neurons in area MT of macaque monkeys with experimental amblyopia. *Journal of Neuroscience*, 30[36]:12198-209.

GRANTS & AWARDS

NSF CAREER 145241 (EI-Shamayleh)

02/01/2022 – 01/31/2027

CAREER: Neural basis of visual shape perception

The goal of this project is to elucidate how the primate cerebral cortex supports the perception of visual shape. The experiments will probe the organization of shape-preferring neurons across cortical layers and the causal role of these neurons in perceptual judgements of visual shape. The project includes several educational activities for disseminating core research concepts to the general public, with a focus on pre-college (K–12) students living in predominantly low-income neighborhoods of New York City.

Role: Principal Investigator

1 R01EY032190-01 (EI-Shamayleh)

01/01/2020 – 08/31/2025

NIH/NEI

Cortical circuit mechanisms of visual shape processing

The goal of this project is to gain mechanistic insights into how the primate cerebral cortex processes visual shape information. The research leverages cutting edge cell type-specific optogenetic manipulations to reveal the contributions of specific neural pathways and cell types in the representation of object shape.

Role: Principal Investigator

Grossman-Kavli Scholar Award (EI-Shamayleh)

07/01/2021 – 06/01/2024

Kavli Institute & Grossman Center for Statistics of the Mind

This award provides general funding for my laboratory and promotes collaborations between experimentalists and theorists at Columbia University.

Role: Principal Investigator

1 R01 NS113113-01 (Shadlen)

07/15/2019 – 03/31/2024

NIH/NINDS/BRAIN

Computational and circuit mechanisms of decision making

The goal of this project is to leverage emerging tools to measure and manipulate neural activity in order to characterize interactions between populations of neurons and to open new areas of computational and mechanistic interrogation of circuit interactions in the service of decision-making and cognitive control.

Role: Co-Investigator