# PARSA NILCHIAN

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*Curriculum Vitae*

## EDUCATION

**Weill Cornell Medical College, New York, NY** Exp. Aug. 2029
*Doctor of Medicine and Doctor of Philosophy*

**University of Oxford, Oxford, UK** Sep. 2022
*Master of Science in Neuroscience*

- **Clarendon Scholar**
- Lincoln College
- Thesis 1: *The spatial dynamics of beta-activity in the Parkinsonian subthalamic nucleus*
- Thesis 2: *The neural mechanisms behind the formation of state cells in the frontal cortex*

**Florida International University, Miami, FL** Apr. 2021
*Bachelor of Science in Biochemistry and Bachelor of Arts in Natural and Applied Science*

- Honors Thesis: *DMN activation and increased RTV in ADHD: A Novel Approach to Detect Inattentio*n
- Honors College Student
- **Cumulative G.P.A. 4.0/4.0 (*Summa Cum Laude)***

## RESEARCH EXPERIENCE

**Memorial Sloan Kettering Cancer Center, New York, NY** Since June 2023
*Summer Research Fellow*

- Applied graph theory to fMRI data from brain tumor patients to study functional reorganization in the language system.
- Analyzed fMRI and clinical data with Python.
- Drafted a manuscript of findings to be submitted to Nature Neuroscience.

**Weill Cornell Medical College, New York, NY** Since Nov. 2022
*Research Assistant in The Epilepsy lab*
Research Advisors: Dr. Theodore Schwartz, Dr. Dimitris Mathios

- Performed 3D reconstruction of brain tumors for a study focusing on the outcomes of endoscopic transorbital skull base surgery
- Assisted in data collection for a project studying the complications associated with shunt replacement surgery.

**University of Oxford, Oxford, UK** Jan. 2022 — Jan. 2023
*Research Assistant in the Bogacz and Behrens Labs*
Research Advisors: Dr. Rafal Bogacz, Dr. Timothy Behrens

- Built an algorithm to detect traveling waves in the Parkinsonian subthalamic nucleus.
- Developed probabilistic cost landscapes identifying beta wave source locations in the subthalamic nucleus.
- Investigated the neural mechanisms behind abstraction in the orbitofrontal cortex of mice.
- Examined how state cells change their tuning to abstract task structures in early learning.

**Novartis Pharmaceuticals, Cambridge, MA** June 2021— Aug. 2021
*Research Assistant at the Novartis Institutes for BioMedical Research (NIBR)*
Research Advisors: Dr. Shuai Chen, Dr. Eric Martin

- Performed Profile-QSAR, a virtual screening algorithm, to predict the activity of over 2 million compounds in novel assays.
- Refined machine learning algorithms and filtering parameters to maximize Random Forest Model and Partial Least Square Model's predictive accuracy.

**National Institutes of Health, Bethesda, MD** June 2021— Aug. 2021
*Intern at the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)*
Advisor: Dr. Robert Walker

- Obtained training on the fundamentals of clinical research procedures.
- Studied the molecular mechanisms behind addiction by participating in weekly journal clubs.

**Florida International University, Miami, FL** Aug. 2020 — Aug. 2021
*Research Assistant at the Raptis Laboratory*
Research Advisor: Dr. Raphael Raptis

- Prepared a report emphasizing lignin's potential as an abundant biopolymer and alternative energy source.
- Synthesized halogenated pyrazoles using N-Halosuccinimides and qualitatively analyzed the products using proton nuclear magnetic resonance (NMR).

**Massachusetts Institute of Technology, Cambridge, MA** May 2020 — Aug 2022
*Research Assistant at the Wilson Laboratory*
Research Advisors: Dr. Matthew Wilson, Dr. Honi Sanders

- Examined the animal-to-animal variability in hippocampal remapping behavior using electrophysiological data.
- Constructed general linear models to investigate the heterogeneity in animals' remapping behavior.
- Published findings as a first-author in the Journal of Neuroscience.

**Massachusetts Institute of Technology, Cambridge, MA** June 2019 — Aug. 2019
*Research Assistant at the Wilson Laboratory*
Research Advisors: Dr. Matthew Wilson, Dr. Honi Sanders

- Collected electrophysiological data and trained mice in an experiment to perform a forced-alteration T-maze task.
- Assisted in tetrode implant surgeries and built calcium imaging sensors.
- Analyzed electrophysiological data with Python, reproduced a previous study's findings, and conducted novel analyses to explore the characteristics of hippocampal remapping. Prepared a 15-page report summarizing the findings and presented them at the MSRP conference.

**Florida International University, The Honors College, Miami, FL** Aug. 2018 — Apr. 2020
*Advanced Research and Creativity through Honors (ARCH) Scholar*
Research Advisor: Dr. Jose Rodriguez

- Obtained training in the stepwise process of developing and submitting a research proposal for committee approval. Submitted an independent research proposal and obtained funding for the upcoming academic year.
- Completed a 10000-word Psychology Honors Research Thesis and received the ARCH Thesis Award.

**Massachusetts Institute of Technology, Cambridge, MA** Jan. 2018 & Jan. 2021
*Quantitative Methods Workshop (QMW) in Biology Participant*

- Obtained intensive training in using programming tools, such as Python and MATLAB, to analyze scientific data, enhancing the quality and productivity of future research experiences.
- Analyzed fMRI and DNA sequencing data with MATLAB to manifest these analyses for future research projects.
- Returned to the workshop as a teaching assistant to help students with MATLAB exercises.

**Florida International University, Miami, FL** Aug. 2017 — Aug. 2020
*Research Assistant at the Memory and Development Laboratory*
Research Advisor: Dr. Aaron Mattfeld

- Tested an independent hypothesis on the relationship between default mode network activation and reaction time variability (RTV) in ADHD and advanced the frequency of fMRI data collection for the RTV study.
- Examined fMRI data from over 40 research participants with neuroimaging software.
- Developed Python scripts for fMRI data analysis and conducted statistical analyses in a Jupyter Notebook.
- Developed hypotheses on the association between preterm birth and increased RTV in ADHD, obtained funding through the Honors College, and led a team of research assistants to collect the survey data.

## CLINICAL VOLUNTEERING

**NewYork-Presbyterian Hospital/Weill Cornell Medical Center, New York, NY** Since Aug. 2022
*Volunteer for Eye2Eye and Heart2Heart*

- Traveled to disadvantaged communities in NYC and provided eye and cardiovascular screening to patients free of charge.
- Referred patients with serious conditions to the Weill Cornell Community Clinic and other healthcare providers.
- Educated patients on the importance of diet, exercise, and preventative medicine for cardiovascular health.

**Weill Cornell Community Clinic (WCCC) New York, NY** Since Aug. 2022
*Volunteer*

- Worked with attending physicians and upperclassmen medical students to provide care for uninsured patients.
- Led a research project to assess the impact of digital pharmacy reimbursements on disadvantaged groups.

**Nicklaus Children's Hospital, Miami, FL** Aug. 2019 — Mar. 2020
*Team Leader and Volunteer*

- Played board games and engaged in conversations with children suffering from various medical conditions to make their stay at the hospital more pleasurable.
- Looked out for children to relieve pressure from medical staff and parents, allowing them to rest.
- Cleaned toys and cooperated with the Volunteer Department to develop an administrative plan to increase the efficiency of volunteers.

**Memorial Regional Hospital, Hollywood, FL** Apr. 2017 — June 2018
*Emergency Room Volunteer*

- Registered more than 30 patients per shift and measured their height and weight to relieve time pressure from medical faculty members.
- Escorted patients to their rooms and provided them with conversational support in applicable cases.
- Observed the interaction between nurses, doctors, and patients to obtain an impression of working environments in hospitals and learn the essential steps of emergency medicine.

## LEADERSHIP AND NON-CLINICAL VOLUNTEERING

**Weill Cornell Medical College, New York, NY** Since Nov. 2022
*President of WCMC's American Association of Neurological Surgeons (AANS) chapter*

- Established the Neurosurgery Publishing and group and organized neurosurgery-oriented events for the medical student body.

*Student representative for the Longitudinal Science Curriculum Committee (LSCC)*

- Attended monthly meetings and represented student perspectives in science-related areas of the curriculum.
- Coordinated with faculty to identify and improve the longitudinal science curriculum.

*Treasurer of the Pre-Operation student organization*
- Managed the semesterly budget and reimbursed costs associated with the outreach events.

*Neurosurgery Diversity, Equity, and Inclusion Summer Program (PRIMES-light)*
- Advised high school students from underrepresented backgrounds on career paths towards neurosurgery.

*Weill Cornell Community Clinic (WCCC) Research and QI associate and board member*
- Led a research project on the impacts of a newly implemented digital reimbursement paradigm.
- Submitted an abstract to Society of General and Internal Medicine (SGIM) regional meeting.

**Clarendon Scholars Association, Oxford, UK** Nov. 2021— Aug. 2021
*Treasurer and Executive officer*
- Managed over $50,000 in funds and ran the organization's daily business matters.
- Held executive meetings, developed the organization's goals, and directed board members.

**Feeding South Florida, Miami, FL** Dec. 2020 — June 2021
*Volunteer*
- Coordinated with a team of volunteers to distribute meals and groceries to Palm Beach County residents fighting hunger in South Florida.
- Transported cardboard, plastic bags, and containers to the appropriate disposal locations to keep the food delivery site clean.

**Florida International University, The Faculty Senate, Miami, FL** Aug. 2020 — June 2021
*Student Representative on the Faculty Senate Environmental Committee (FSEC)*
- Coordinated with FSEC members to advance environmental resolutions concerning pesticide use and bird safety on FIU's main campus.
- Advocated for the replacement of single-use plastics and held a presentation for the FSEC and FIU's CFO, highlighting the necessity of paper bags.
- Shared progress and upcoming goals with the Honors College.

**Mass General Brigham Center for COVID Innovation (MGBCCI), Boston, MA** Mar. 2020 — May 2020
*Volunteer*
- Compiled data on personal protective equipment (PPE) shortages in Barnstable and Berkshire County in Massachusetts to facilitate the distribution of PPE preventing shortages during the pandemic's peak.
- Contacted hospital administrators and visited government websites to identify PPE products in need (e.g., N95 masks) at specific health facilities in the two counties above.
- Reported twice a week to a supervisor.

**Florida International University, The Honors College, Miami, FL** Aug. 2019 — June 2021
*Founder and President of the Green Campus Initiative (GCI*)
- Recruited a team of 10 students and developed a plan to reduce the use of plastic bags on FIU's MMC campus.
- Presented an action plan on how to replace plastic bags with environmentally friendly alternatives to the Faculty Senate Environmental Committee. **Drafted and passed a resolution titled "Reducing the use of single-use plastics on campus" through FIU's Faculty Senate Environmental Committee (FSEC).**
- Coordinated with FSEC members to advance the resolutions' implementation university-wide.

**Florida International University, Miami, FL** June 2018 — Jan. 2020
*Secretary of the FIU Chapter of the American Chemical Society (ACS)*
- Raised funds for the ACS's FIU chapter by selling laboratory equipment to chemistry students.
- Planned and implemented ACS community outreach events to raise awareness of the significance of chemistry, motivating teenagers to pursue a career in the chemical sciences.

**Florida International University, The Honors College, Miami, FL** May 2018 — Jan 2020
*Co-founder and Secretary of Help Your Peers Excel (H.Y.P.E)*

- Developed a peer mentorship and career workshop program, supporting disadvantaged first-year students.
- Coordinated with Honors students and faculty to establish H.Y.P.E. as a social student organization by developing the organizational structure and framing its constitution.
- Served as Secretary in e-board meetings & organized events, connecting H.Y.P.E. mentors and mentees.

**Florida International University, Miami, FL** Jan. 2018 — Jan 2020
*General and Organic Chemistry Tutor*

- Provided students with instructions on homework to illustrate challenging concepts of selected assignments.
- Elaborated on the crucial concepts of organic chemistry to prepare students facing difficulties for examinations.

## CERTIFICATIONS

- Cert. of Achievement, MITX: 3.032.1x: Mechanical Behavior of Materials Part I — Jan. 2021
- Cert. of Achievement, HarvardX: MCB80.3x Fundamentals of Neuroscience Part III — July 2019
- Cert. of Achievement, HarvardX: MCB80.2x Fundamentals of Neuroscience Part II — Jan. 2019
- Cert. of Achievement, HarvardX: MCB80.1x Fundamentals of Neuroscience Part I — Jan. 2019
- Cert. of Achievement, MITX 6.00.1x Introduction to Computer Science and Programming — Mar. 2018
- Cert. of Achievement, MRI Safety Training Level-1 — Oct. 2017

## HONORS, AWARDS, AND FELLOWSHIPS

- 1st place poster presentation, 2023 Northeast Medical Student Neuroscience Symposium at Hofstra — Dec. 2023
- **Memorial Sloan Kettering Summer Research Fellowship** — **June 2023**
- **Lincoln College Graduate Research Fund** — **May 2022**
- **Clarendon Scholarship** — **Aug. 2021**
- **Lincoln College Kingsgate Master's Award** — **Aug. 2021**
- **Novartis Institute of BioMedical Research (NIBR) Summer Fellowship** — **June 2021**
- National Institute of Arthritis & Musculoskeletal & Skin Diseases (NIAMS) Summer Fellowship — June 2021
- **Outstanding Senior Leadership Award** — April 2021
- Phi Beta Kappa — April 2021
- MV Real Estate First-Generation Scholarship — Feb. 2021
- Harvey L. Young Family Foundation Scholarship — Aug. 2020
- **Scholar Award for Academic Achievement and Research** — Apr. 2020
- Navarro Family Foundation First Generation Scholarship Endowment — Mar. 2020
- American Chemical Society Commendable Award 2018-19 — Feb. 2020
- **ABRCMS 2019 Presentation Award in Neuroscience** — **Nov. 2019**
- ABRCMS Travel Scholarship — Nov. 2019
- Manuel and Mercedes Mosteiro Scholarship — Aug. 2019, Aug. 2020
- **Annual Honors College Research Award** — Aug. 2019
- **Honors College Dean's Advisory Board Scholarship** — Oct. 2018, Aug. 2019, Aug 2020
- MIT CBMM Summer Research Program in Neuroscience (MSRP-CBMM) — June 2019
- ARCH Thesis Stipend — Apr. 2019
- Dr. E. George Simms Research Scholarship — Feb. 2019
- **Ronald E. McNair Research Fellowship** — Feb. 2019
- First-Generation College Student Scholarship — Jan. 2019
- **Honors College ARCH Research Scholarship** — Jan. 2019
- Student Government Association Residential Scholarship — Apr. 2018
- Dean's List and Honors College Dean's List — Dec. 2017-Apr.2021

***Bold = significant research awards***

# SELECTED PRESENTATIONS AND ABSTRACTS

**Nilchian, P.,** El-Gaby M., Dupret, D. & T. Behren (2023). Mechanisms of context-dependent learning in the mouse frontal cortex, **Accepted to the Society for Neuroscience (SFN) 2023 Annual Meeting. Poster Presentation.**

**Nilchian, P.,** Purkayashtha, S., Thomas, G., Curtis, K., Roszowska, N., Benitez, E., Merlinsky, T., Batavia, A., Nicol, C. & P. Charney (2023). Impacts of systems of digital pharmacy reimbursements in a student-run free clinic, Society for General and Internal Medicine (SGIM) Northeast Regional conference 2023. Oral Presentation.

**Nilchian, P.,** Jenabi, M., Pasquini, L., Peck, K. & A. Holodny (2023). Functional reorganization of the language network in patients with a left-sided brain tumor. Weill Cornell Medical Student Research Day, Oral and Poster presentation.

**Nilchian, P.,** Jenabi, M., Pasquini, L., Peck, K. & A. Holodny (2023). A graph theoretical description of language network reorganization in patients with a left-sided lesion, 2023 Northeast Medical Student Research Symposium at Hofstra, Abstract.

**Nilchian, P.,** Duchet, B., Averna, A., Tinkhauser, G. & R. Bogazc (2023). A model for identifying traveling waves in the subthalamic nucleus of patients with Parkinson's Disease, 2023 Northeast Medical Student Research Symposium at Hofstra, Abstract.

Kush, S., Maxin,A., Kehne, T., **Nilchian, P.**, Gulek, B.,. McGrath, L., Grabowski, T., & M. Levitt (2023). Smartphone Pupillometry Use in Neurodegenerative Disease: A Clinical Pilot Study, **American Academy of Neurology, Abstract.**

Martin E., Pikusa, M., Zhu, X., **Nilchian, P.** & E. Di Lascio, (2022) Recent extensions of Profile-QSAR: beyond successful IC50 models for 9,000 assays, ACS Fall Session 2022.

**Nilchian, P**. (2022). Animal-to-Animal Variability in Partial Hippocampal Remapping. **Federation of European Neurosciences Conference (FENS),** Poster presentation.

**Nilchian, P**. (2021). Animal-to-Animal Variability in Hippocampal Remapping. **The 20th Annual New England Science Symposium (NESS 2021)**, Poster Presentation.

**Nilchian, P**. (2021). Structured Heterogeneity Across Animals in Remapping Behavior. **2021 National Conference for Undergraduate Research**, Oral Presentation.

**Nilchian, P**. (2021). Animal-to-Animal Variability in Hippocampal Remapping. *2021 Undergraduate Research Conference FIU (URFIU), Poster Presentation.*

**Nilchian, P**. (2021). Structured variability across animals in remapping behavior. ***2021 Florida Undergraduate Research Conference,*** *Poster Presentation.*

Sanders, H. & **Nilchian, P**. (2021). Animal-to-Animal Variability in Hippocampal Remapping Behavior. ***2021 Society for Neuroscience Global Connectome,*** *Virtual Poster Presentation.*

**Nilchian, P**. (2020). Structured Heterogeneity in remapping behavior across animals. ***2020 ABRCMS Research Conference,*** *Virtual Poster Presentation.*

**Nilchian, P. (**2020). DMN and DAN activation are stable during periods of increased and stable RTV. *2020 FIU Conference for Undergraduate Research,* Miami, FL, Virtual Poster Presentation.

**Nilchian, P**. (2020). Structured Heterogeneity in remapping behavior across animals. *2020 MIT MSRP Summer Research Conference**, Cambridge, MA, Oral presentation.*

**Nilchian, P**. (2019). Quantification of hippocampal remapping: How do we measure change? ***2019 ABRCMS Research Conference****. Anaheim, CA, Poster Presentation.* ***(Presentation Award in Neuroscience)***

**Nilchian, P**. (2019). Quantification of hippocampal remapping: How do we measure change? ***2019 McNair Scholar Research Conference****. Miami, FL, Oral Presentation.* ***(2nd Place).***

**Nilchian, P**. (2019). Characteristics of hippocampal remapping in repeated and different environments. *2019 McNair Scholar Research Conference. Miami, FL, Poster Presentation.*

**Nilchian, P**. (2019). Characteristics of hippocampal remapping in repeated and different environments. *2019 McNair Symposium. Miami, FL, Poster Presentation.*

**Nilchian, P**. (2019). Characteristics of hippocampal remapping in repeated and different environments. *2019 MIT MSRP Summer Research Conference.* Cambridge, MA, *Poster Presentation.*

**Nilchian, P**. (2019). Characteristics of hippocampal remapping in repeated and different environments. *The Wilson Laboratory Meeting, Oral Presentation*

**Nilchian, P**. (2019). Hippocampal remapping in repeated environments may be bimodal. *MIT Center for Brains, Minds, and Machines Oral Presentation Session*. Cambridge, MA, Oral Presentation.

**Nilchian, P**. (2019). Increased Reaction Time Variability in ADHD: A Novel Approach to Detect Inattention. ***National Conference of Undergraduate Research 2019 (NCUR)***. Kennesaw, GA, Poster Presentation.

**Nilchian, P.** (2019). Increased Reaction Time Variability in ADHD: A Novel Approach to Detect Inattention. *FIU Conference for Undergraduate Research*. Miami, FL, Poster Presentation.

**Nilchian, P.**, Mitchel, K., & Spencer, A. (2018). Help Your Peers Excel: A Proposal for an Innovative Honors Program at FIU. *FIU Honors Innovation Conference 2018*. Miami, FL, Poster Presentation.

# PUBLICATIONS

**Completed:**

Chavez-Herrera, VR., Desai, R., Gel, G., **Nilchian, P.** & T. Schwartz (2024). Endonasal endoscopic surgery for pituitary adenomas, Clinical Neurology and Neurosurgery, 237, 2024.

Mathios, D., Bobeff, E., Longo, D., **Nilchian, P.,** Estin, J., Schwartz, A., Austria, Q., et al., (2023) The lateral transorbital approach to the medial sphenoid wing, anterior clinoid, middle fossa, cavernous sinus, and Meckel's cave: Target-based classification and intermediate-term ocular outcomes. ***Journal of Neurosurgery*** (in press, published online DOI:10.3171/2023.6.JNS23678).

**Nilchian, P.,** Wilson, M., & H. Sanders (2022). Animal-to-Animal Variability in Partial Hippocampal Remapping*,* ***The Journal of Neuroscience****, 42 (26),* 5268-5280.

**Nilchian, P**. (2019). DMN activation may not be related to increased RTV in ADHD. *Proceedings of the National Conference of Undergraduate Research 2019*. 280-291. http://www.ncurproceedings.org/ojs/index.php/NCUR2019/article/view/2858/1466.

**Nilchian, P**. (2019). Increased Reaction Time Variability in ADHD: A Novel Approach to Detect Inattention. *Journal of Student Research 2019*. https://www.jofsr.org/index.php/path/article/view/660. Poster and Abstract Publication.

**Submitted or in progress for submission:**

Saha, A., Gibbs, H., Peck, K., Yildirim, O., **Nilchian, P.,** Karimi, S., Lis, E., Kosovic, V., & A. Holodny (2023), Dynamic Contrast-Enhanced MRI for the Diagnosis and Treatment Assessment of Spinal Metastases, *American Journal of Neuroradiology*, under review, submitted on 07/09/2023.

Winston, G., **Nilchian P.,** Greenfield, J. & D. Jones, A., Intrathecal Baclofen Pump for Severe Dystonia in a Patient with Juvenile Huntington's Disease: A Case Report (2023), *Movement Disorders*, under review, submitted on 10/22/2023.

**Nilchian, P.,** Jenabi, M., Peck, K., Pasquini, L. & A. Holodny (2023). Functional reorganization of the language network in patients with left-sided brain tumors, in preparation for the *Nature Neuroscience*.

**Nilchian, P.,** Duchet, B., Tinkhauser, G., Averna, A. & R. Bogacz (2023). The spatial dynamics of beta activity in the parkinsonian subthalamic nucleus, in preparation for *Progress in Neurobiology*.

**Nilchian, P.,** Purkayashtha, S., Thomas, G., Curtis, K., Roszowska, N., Benitez, E., Merlinsky, T., Batavia, A., Nicol, C. & P. Charney (2023). Impacts of systems of digital pharmacy reimbursements in a student-run free clinic, in preparation for the Journal of Community Health.

Babu, C., Cardenas, U., **Nilchian, P.,** Lewis, C., An, A. & T. Schwartz (2023). A comparative analysis of peritoneal trocar and laparoscopic distal ventriculoperitoneal shunt placement: A single institutional review, in preparation for the *Journal of Neurosurgery*.

# PATENTS

UK-IP 21186: Duchet, B., Tinkhauser, G., **Nilchian, P.,** Averna, A. & R. Bogacz (2022). Method for optimization of DBS, University of Oxford, Pending.

# SKILLS

### *Computer and data analysis*

- **Data analysis with Python and MATLAB:** **Full proficiency**
- Microsoft Office PowerPoint, Excel, and Word: Full proficiency
- Electrophysiological data processing with OpenEphys, Phy, Kilosort: Full proficiency
- Parametric and non-parametric hypothesis testing: Full proficiency
- Overleaf and LATEX Full proficiency
- fMRI and neuroimaging software (FreeSurfer, AFNI, CONN): Intermediate proficiency
- R, Bash, and ChemDraw: Intermediate proficiency

### *Laboratory*

- Chromatography, extraction, fractional and simple distillation, vacuum filtration: Full proficiency
- Gel electrophoresis, DNA extraction, PCR, cell cultures, dissection, organic synthesis: Intermediate proficiency
- Mass Spectrometry, Infrared Spectroscopy, Proton NMR, crystallization: Intermediate proficiency

### *Language*

- German, Persian, and English: Native proficiency
- Spanish: Intermediate proficiency
- French: Elementary proficiency