

Noah Chaim Freedman

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ACADEMICS & EXAMINATIONS

May 2021–Present

MD PhD Student in University of Pittsburgh & Carnegie Mellon University Medical Scientist Training Program

- Prospective Graduate Department: Program in Neural Computation (CMU)

September 2015–May 2019

University of Pittsburgh Department of Bioengineering, B.S., B.Phil

- Bachelor of Philosophy
 - Honors Thesis: Advancing Squarewave Voltammetry at PEDOT/fCNT Carbon Fiber Microelectrodes for In Vivo Basal Dopamine Detection
 - ~10 students in each graduating class. Designed personalized curriculum with the Honors College and defended research thesis covering work in the Neural Tissue Engineering Lab
- Bioengineering concentration: Signal Processing and Neural Engineering
- Minor: Chemistry
- Cumulative GPA: 3.79

PROFESSIONAL & RESEARCH EXPERIENCE

May 2019–2021

Postgraduate Research Associate

Yale School of Medicine Department of Neurology, Blumenfeld Lab, Dr. Hal Blumenfeld, M.D., Ph.D

- Investigating neural dynamics underlying conscious sensory perception of tactile and auditory stimuli via
 - devising perceptual decision tasks for epilepsy patients undergoing intracranial EEG recordings
 - developing algorithms and statistical approaches to connect brain activity and behavior
- Publications
 - Kwon H, Kronemer SI, Christison-Lagay KL, Ding JZ, **Freedman NC**, Blumenfeld H. “Early Cortical Signals in Visual Stimulus Detection.” *NeuroImage*. 2021.
 - Gusso M, Christison-Lagay KL, Zuckerman D, Chandrasekaran G, Kronemer S, Ding J, **Freedman NC**, Nohana P, Blumenfeld H. “More than a feeling: scalp EEG and eye correlates of conscious tactile perception.” (submitted to *Cortex*)

April 2017–May 2019

Undergraduate Research Associate

University of Pittsburgh, Neural Tissue Engineering Laboratory, Dr. X. Tracy Cui, Ph.D.

- Developed a microelectrode system for real-time measurements of absolute dopamine concentration in the rat striatum, comprising my Bachelor of Philosophy Honor’s Thesis
- Publications
 - Taylor IM, Patel NA, **Freedman NC**, Castagnola E, Cui XT. “Direct *In Vivo* Electrochemical Detection of Resting Dopamine Using Poly(3,4-ethylenedioxythiophene)/Carbon Nanotube Functionalized Microelectrodes.” *Analytical Chemistry*. 2019.
 - Freedman NC, Cui XT. “*In vivo* dopamine sensors for basic neuroscience and biomedical research: a review” *Ingenium* 2019, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA.
- Presentations
 - Freedman NC. “Advancing Squarewave Voltammetry at PEDOT/fCNT Carbon Fiber Microelectrodes for In Vivo Basal Dopamine Detection.” Bachelor of Philosophy Honor’s Thesis Defense, University of Pittsburgh, Pittsburgh, PA, April 16th, 2019.

- Freedman NC, Taylor IM, Cui XT. "Sensitive and selective polymer nanocomposite for resting-level dopamine detection at carbon fiber microelectrodes." Podium Presentation, Biomedical Engineering Society Annual Conference, Atlanta, GA. October 20th, 2018.
- Freedman NC, Taylor IM, Cui XT. "Sensitive and selective polymer nanocomposite for dopamine detection at carbon fiber microelectrodes." BioE Day Spotlight Presentation, University of Pittsburgh Department of Bioengineering, Pittsburgh, PA April 5th, 2018.
- Freedman NC, Taylor IM, Cui XT. "PEDOT/fCNT for resting-level dopamine detection at carbon fiber electrodes with square wave voltammetry." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL March 28th, 2018.

May 2016–May 2019

Undergraduate Research Associate

University of Pittsburgh, Program in Cognitive Affective Neuroscience, Dr. Greg Siegle, Ph.D.

- Developed a MATLAB and C++ software platform with a graphical interface to facilitate psychophysiology data collection. With a computer and commercially available devices, researchers may easily run experiments outside of their lab using this technology
- Designed software for running cognitive tasks and contributed to early developments of Purrr, a device for regulating stress in real-time via vibrational stimulation dependent on real-time physiological signals. Purrr has been commercialized through the Apollo company

May 2018

Johns Hopkins Neurosurgery Clinical and Research Fellowship, Dr. Chetan Bettegowda, M.D., Ph.D

- Clinical observation of neurosurgical procedures at Johns Hopkins Hospital and volunteer research in Hunterian Neurosurgical Laboratory comprising chemotherapeutic treatment regimes for nervous system tumors and novel ventriculoperitoneal shunt designs for hydrocephalus

January 2018–May 2018

Spatio-Temporal Approaches for Characterizing Cross-Subject Frequency-Domain EEG Correlations

Jointly mentored by Dr. Greg Siegle, Ph.D and Dr. Prahlad G Menon Ph.D.

- Analyzed similarities in brain activity as measured by scalp EEG in pairs of subjects performing meditation-based depression therapy

August 2015–June 2016

Undergraduate Research Associate

University of Pittsburgh, Orthopedic Robotics Laboratory, Dr. Richard Debski, Ph.D.

- Designed LabView operating software for the Shoulder Testing Apparatus R4 robot which performs mechanical analysis of cadaver shoulder samples via simulated muscle contraction

AWARDS AND RECOGNITIONS

University of Pittsburgh Full Academic Scholarship (2015–2019)

University of Pittsburgh Dean's Award (2019)

University of Pittsburgh Dean's Honors List (2017–2019)

University of Pittsburgh Bioengineering Outstanding Student Award (2019)

University of Pittsburgh Swanson School of Engineering Summer Research Fellowship (2018)

- Highly selective research fellowship to conduct summer research in the Neural Tissue Engineering lab under Dr. Tracy Cui's mentorship

University of Pittsburgh Biomedical Engineering Day Spotlight Presentation (2018)

- Selected as one of 4 presenters among 400 graduate and undergraduate students to showcase honors thesis research in the Neural Tissue Engineering Lab during our annual Biomedical Engineering Day

University of Pittsburgh Senior Design Expo 1st Place Best Overall Project Award (2016)

- In collaboration with emergency medicine personnel at the University of Pittsburgh, developed the EMS Backboard Pad for backboarding procedures to mitigate risk of ulcer development and improve patient comfort
- Design Expo: an annual event showcasing final design projects for all Swanson School of Engineering senior students. Seniors have 1 year to construct a meaningful project that is evaluated alongside projects of their peers

LEADERSHIP

Musical Generations branch of MusiCare (August 2021–Present)

- Providing social musical activities to nursing homes in the Pittsburgh area
- Part of the University of Pittsburgh Medical School MusiCare club

Musical Generations (Undergraduate Club), Founder and President (October 2017–May 2019)

- Providing social musical activities to nursing homes in the Pittsburgh area
- Music- and service-oriented undergraduates visited nursing homes on a monthly basis for cooperative musical practice and performance with elderly residents

Biological Signals and Systems, Undergraduate TA (August–December 2018)

- Weekly office hours and weekly personal help sessions to help students understand fundamental concepts in the mathematical analysis of biological signals

University of Pittsburgh Outdoors Club, Climbing Chair (January 2017–2018)

The Art of Making: Hands-On Systems Design and Engineering, Undergraduate TA (December 2016–May 2017)

- This course fosters skills in design thinking, prototyping, technical fabrication, user outreach during the product design process, and human-centered design. Final design projects are presented at two University of Pittsburgh conferences including the Swanson School of Engineering Senior Design Expo
- Guided students during their final projects, helped with hands-on exercises and fabrication workshops, maintained and actively remodeled our maker-space, and provided input on course structure and content

VOLUNTEER EXPERIENCE

Musical Generations (October 2017–December 2018)

- Ran weekly to monthly 1-hour music therapy sessions at the Schenley Gardens assisted living facility. During these sessions, students from the University of Pittsburgh play music with the elderly residents

University of Pittsburgh Shadyside Hospital Medical Center Palliative Care (May–August 2017)

- Provided support to patients and families in the UPMC Palliative Care unit in this hospital by visiting their rooms, bring them water and food, spending time with them to talk or by just being present
- Participated in weekly meetings with physicians and other Palliative care workers to discuss ongoing and upcoming cases and how to best address their care

Son-Rise Program Facilitator (May 2012–June 2016)

- Conducted weekly 2-hour sessions with a young girl diagnosed with severe ASD to encourage development of motor skills, speech, reading, writing, emotional expression, communication, and social awareness
- Collaborated with developmental therapists, occupational therapists, speech pathologists and Son-Rise coordinators to continuously develop a specialized educational and developmental program for Sarah based on the Son-Rise framework <https://autismtreatmentcenter.org/>