

Daniel Pollak

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Education

BS, Neuroscience. GPA: 3.8, Dean's List.

University of Massachusetts, Amherst, Commonwealth Honors College, 2019.

Thesis: "Broad and narrow-spiking neurons in the zebra finch caudomedial nidopallium."

Minored in Computer Science.

Honors and Awards

Commonwealth Honors College Honors Research Grant	2017, 2018
Provided funds to print custom printed circuit boards for microdrive and miscellaneous expenses for electrophysiology	
Commonwealth Honors College Research Assistant Fellowship	2016
Small stipend to for working in lab	
Excellence in Medical Research, Westchester Science and Engineering Fair	2014, 2015
Intel Science Talent Search feeder competition	

Research experience

2018 Summer Research Fellow, Backyard Brains

Python, electromyography, writing publications and blog posts, animal handling, behavioral experimentation, illustration

<https://github.com/BackyardBrains/MantisShrimpEMG> (code); www.danpollak.com/BYB (explainers)

Advisor: Dr. Gregory Gage

Developed low-cost EMG setup in mantis shrimp and other arthropods and investigated mechanisms of power-amplification in mantis shrimp and crickets. Published work in Journal of Neuroscience Education (JUNE).

University of Massachusetts, Amherst, Research Assistant. 2015-2019

Circuit board design, electrode fabrication, animal handling and surgery, histology, Phy/Kilosort spike sorting, MATLAB, Python, Igor Pro, soldering and electronics

Advisor: Dr. Luke Ramage-Healey

www.github.com/zeebie15

Developed a lightweight and inexpensive microdrive design for deployment in zebra finches. Deployed microdrives in several subjects and collected neural data from awake behaving animals during audition from the caudomedial nidopallium. Developed automated Phy/Kilosort driver for spike sorting.

Developed data analysis pipeline in MATLAB and Igor Pro for analyzing and visualizing patch clamp data from marmosets.

Rose F. Kennedy Center, Albert Einstein College of Medicine, Research assistant. 2013 – 2015

Animal handling and surgery, optogenetics, electrophysiology, MATLAB, manual spike sorting, anesthesia

Advisor: Dr. Kamran Khodakhah

Investigated putative cerebral-mesolimbic circuit likely involved in autism and/or schizophrenia. Administered delivery of viral vector and implantation of head fixing apparatus and carried out recorded extracellular activity with optogenetics in anesthetized and head-restrained awake mice. Performed spike sorting in Plexon Offline Spike Sorter, analyzed data in MATLAB.

Urology, Albert Einstein College of Medicine, Internship. 2012

Histology

Advisor: Dr. Margaret Tuvell

Performed histological analysis for model of overactive bladder in rodents. Fluorescent visualization and counting of nanoparticles.

Publications

Gervais, N. J., Remage-Healey, L., Starrett, J. R., Pollak, D. J., Mong, J. A., & Lacreuse, A. (2018). Adverse effects of aromatase inhibition on the brain and behavior in a non-human primate. *The Journal of Neuroscience*, 39(12), 1–11. <https://doi.org/10.1523/JNEUROSCI.0353-18.2018>

An Optogenetic Investigation of Cerebellum-VTA Pathway Inputs to the Prefrontal Cortex and Nucleus Accumbens. Presented for Intel Science Talent Search and the Siemens Competition.

Time Course of Hydrogel Nanoparticles for Gene Therapy to Treat Overactive Bladder. Presented research for Westchester Science and Engineering Competition.

Relevant Classwork and Projects

Internet of Things (IoT) and mobile computing

ESP8266-based device integrates data from RFID, accelerometer, Google Calendar API, and a smartphone application to make a smart backpack that alerts user of forgotten items inferred from one's schedule. <https://github.com/hamdanspam/Bapabackup>

Android app and associated Arduino scripts communicate Lightblue Bean-based smartwatch and Android phone via Bluetooth low energy (BLE). <https://github.com/hamdanspam/Beantalker>

Interactive game of life simulator. <https://github.com/hamdanspam/Fraya>

Artificial Intelligence

Search

Adversarial search with minimax algorithm for tic-tac-toe

A* search for 15-puzzle

Supervised Learning

Decision tree learning for party classification of congresspeople from voting data

Naïve Bayes classification of party of congresspeople from voting data

Naïve Bayes classification of good/bad movie reviews from IMDB data

Unsupervised Learning

Hierarchical and k-means clustering algorithms for party classification of congresspeople from voting data