Jackson Powell – CV, Full

Stanford School of Medicine

Contact Information

powellj@stanford.edu (850) 559-4266

Brief Personal Statement

Since I was eight, I have only wanted to be a neurosurgeon. What fascinates me most is the use of brain-computer interfaces and neuromodulation in aiding neural repair—including recovery after spinal cord injury, traumatic brain injury, stroke, and neurodegenerative diseases.

At the University of Pennsylvania, I was in the Vagelos Molecular Life Sciences program under directors Drs. Jeffery Saven and Elizabeth Rhoades. I was fortunate enough to work in the Song Lab and had the chance to lead projects centered on axon regeneration under Dr. Yuanquan Song. From Dr. Casey Halpern, I saw the remarkable intersection of technology and neurosurgery—including in treatments like deep brain stimulation. I learned about the electrical properties of circuits, from Dr. Bill Ashmanskas, and cells, from Dr. Yoichiro Mori. Finally, I learned of interfacing these two systems from Drs. Brian Litt and Iahn Cajigas.

Now, I am fortunate enough to be in the Medical Scientist Training Program at Stanford under directors Drs. Catherine Blish and Katrin Chua. **None of my success would have been possible without great mentors.**

Education

Stanford University, School of Medicine 2024 – present
Medical Scientist Training Program (link)
M.D.-Ph.D. Candidate

University of Pennsylvania 2020 – 2024
Vagelos Molecular Life Sciences Scholar (link)
B.A., Biochemistry & B.A., Biology
Notable coursework:
- Brain-Computer Interfaces (BE 5210)
- Mathematical Modeling in Biology (MATH 5681)
- Laboratory Electronics (PHYS 3364)

Honors and Awards

summa cum laude, University of Pennsylvania	2024
Founder's Award (awarded to 2 in biochemistry)	2024
Phi Beta Kappa (link)	2024
Vagelos Challenge (full tuition senior year, link)	2023
AXA Achievement Scholarship (link)	2020

Research

Google Scholar: (link); ORCiD: (link)

Interests: Brain-computer interfaces, neural regeneration, technology in neurosurgery

Ramayya Lab, Stanford School of Medicine (link) Summer, 2024

Advisor: Ashwin Ramayya, MD, PhD
EEG-based analysis of anticipation

Song Lab, Children's Hospital of Philadelphia (link) 2021 – 2024

Advisor: Yuanquan Song, PhD
Axon regeneration, glia-neuron interactions

Teaching

Teaching Assistant
University of Pennsylvania:

PHYS 3364 / 5564, Laboratory Electronics (link)	Fall, 2023
BIOL 3310, Principles of Human Physiology (link)	Fall, 2023
PHYS 3364 / 5564, Laboratory Electronics (link)	Spring, 2023

Tutoring

Philadelphia HS for Girls, Science Olympiad, weekly	Spring, 2023
Central HS, Science Olympiad, weekly	Fall, 2022

Leadership

Science Olympiad at UPenn (SOUP) (link)
Invitational competition hosting ≈ 1000 high school students

Co-President / Co-Tournament Director	2022 – 2023
Finance Director	2021 – 2022

Chiles Science Olympiad, high school team

President	2018 – 2020
Co-President, Co-Founder	2017 – 2018

Computer Science

Courses On:
C++, Python, Java, SAS, Unix

Experience With:
LaTeX, Verilog, Arduino, HTML, MatLab

Python experience with: pandas, scikit-learn, TensorFlow, PyTorch, etc.

Publications (Peer Reviewed)

J Powell, T Steinschaden, R Horowitz, Y Song. Calcium channels caught in peripheral glia's tug-of-war on axon regeneration in *Drosophila*. *Neural Regeneration Research*, Online: April 16, 2024. DOI: https://doi.org/10.4103/NRR.NRR-D-23-02049

S Trombley*, J Powell*, P Guttipatti*, A Matamoros, X Lin, T O'Harrow, T Steinschaden, L Miles, Q Wang, S Wang, J Qiu, Q Li, F Li, and Y Song. Glia instruct axon regeneration via a ternary modulation of neuronal calcium channels in *Drosophila*. *Nature Communications*, Oct. 14, 2023. DOI: https://doi.org/10.1038/s41467-023-42306-2
*Equally contributing

L Miles, J Powell, C Kozak, and Y Song. Mechanosensitive Ion Channels, Axonal Growth, and Regeneration. *The Neuroscientist*, **Cover article**, Aug. 29, 2023. DOI: https://doi.org/10.1177/10738584221088575

Submitted: Q Wang, L Miles, S Wang, H Noristani, E Monahan, J Powell, S J O'Rourke-Ibach, S Li, Y Song. Targeting and anchoring the mechanosensitive ion channel Piezo to facilitate its inhibition of axon regeneration. *Submitted to Cell Reports*.

(Non-Peer Reviewed / Opinions)

Q Ye, ..., J Powell ..., A Uzonyi. Research beneficiaries speak. *Science*, April 4, 2024. DOI: https://doi.org/10.1126/science.adp2180

K Bismuth, V Sharma, J Powell, ..., J M Dedyo. Historical introductions. *Science*, Oct. 6, 2023. DOI: https://doi.org/10.1126/science.adk8769

A B Heim, ..., J Powell, ..., A Uzonyi. AI in search of human help. *Science*, July 14, 2023. DOI: https://doi.org/10.1126/science.adi8740

G Singh, ..., J Powell, S Sarnala. The fruits of failure. *Science*, Jan. 5, 2023. DOI: https://doi.org/10.1126/science.adg1443

R Tang, ..., J Powell, S N Kirshner. When internships disappoint. *Science*, Oct. 6, 2022. DOI: https://doi.org/10.1126/science.ade6397

J Powell. Review: Harakiri. *Penn Moviegoer*, Nov. 18, 2021. (link)

(Features / Reflections)

J Powell. How Research Shaped My Career Goals. *UPenn Center for Undergraduate Research & Fellowships*, April 29, 2024. (link)

Peering beyond the haze of alien worlds, and how failures help us make new discoveries. *Science Magazine Podcast* (Jan. 12, 2023) (link)

J Powell. Puzzling Topics in Neuroscience. *UPenn Career Services*, Jan. 19, 2022. (link)

Abstracts, Posters, Talks (Presented)

J Powell, Y Song. The mechanosensitive ion channel Piezo and the growth cone interactions of a regenerating axon. *Biochemistry Poster Session*, (April 24, 2024) (pdf)

J Powell, Y Song. The mechanosensitive ion channel Piezo's role in the growth cone. *Center for Undergraduate Research & Fellowships Symposium*, (Sept. 18, 2023), (link, pdf)

J Powell. The mechanosensitive ion channel Piezo's role in the growth cone. *Vagelos Molecular Life Sciences*, **10 mins**. (June 27, 2023)

J Powell. Glial control of axon regeneration through voltage gated calcium channels. *Developmental Neuroscience*, **25 mins**. (Nov. 16, 2022)

J Powell. Glial control of axon regeneration through neuronal voltage gated calcium channels. *Vagelos Molecular Life Sciences*, **10 mins**. (July 4, 2022)

J Powell*, Kevin Bryan*, Yuanquan Song. The Novel Role of Trpml and Btv in *Drosophila* Mechanosensation and Decision Making. *Children's Hospital of Philadelphia Poster Symposium*, (May 25, 2022) (pdf)
*Equally contributing

J Powell. Glial control of neuron regeneration. *Joint CCMT Lab Meeting*, **30 mins**. (April 27, 2022)

J Powell*, A Fernandes*, A Zhai*. The Venom of the *Dolomedes triton*: functional effects on allopatric and sympatric prey items. *Young Scholars Program Symposium.* (July 26, 2019) (link, pdf)
*Equally contributing

(Not Presented) **L Ryll (presenter)**, J Powell, Q Wang, N Akizu, Y Song. Investigating the ESCRT-III complex as an executor of Piezo's inhibition of axon regeneration in *Drosophila melanogaster* larva and human neuromuscular junction organoids. *Children's Hospital of Philadelphia Poster Symposium*, (May 1, 2024); *Pathology & Laboratory Medicine Research Day*, (May 8, 2024) (pdf)

Grants / Stipends

Vagelos Molecular Life Sciences (link)	$10,000	Summer 2023
Louis H Castor, M.D., C'48 (link)	$1,000	2022
Vagelos Molecular Life Sciences (link)	$11,000	Summer 2022
Ben Art Bucks (link)	$250	2022
UPenn Career Services Summer Grant (link)	$4,500	Summer 2021
Young Scholars Program (link)	$3,000	Summer 2019

Please feel free to reach out to me with questions or ideas for collaboration (email). It would be a pleasure to hear from you.