DIANA KING

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EDUCATION

University of Pennsylvania, Philadelphia, PA
August 2024 – present
Neuroscience

Johns Hopkins University, Baltimore, MD
September 2018 – May 2022
Neuroscience B.S. Minor: Psychology
Faculty honors (Dean's List), Departmental Honors (Neuroscience), Nu Rho Psi member (National Honor Society in Neuroscience)

RESEARCH EXPERIENCE

National Institutes of Health, Clinical Center, Bethesda, MD
Post Baccalaureate Research Fellow, July 2022 – July 2024

- Investigated the molecular mechanisms of pain and development of non-opioid analgesic therapies.
- Used RNAscope alongside multiplex immunohistochemistry to demonstrate expression of the putative analgesic target, Adenosine A3 receptor, in microglia but not neurons, as has been previously suggested from rodent studies.
- Worked directly with Advanced Cell Diagnostics to optimize a custom 6-plex TSA amplified hybridization to validate analgesic targets in the human dorsal root ganglion.
- Assisted in designing and testing a novel apparatus and protocol used for photobleaching autofluorescence in healthy and pathological (Alzheimer's Disease) human tissues, greatly improving the accuracy of resulting data,
- Implemented the Dirichlet Process Mixture Model, a non-parametric clustering algorithm, to approximate cell types in the human DRG by clustering fluorescent signal intensity.
- Used RNAscope alongside the Dirichlet Process Mixture Model to characterize human tissue specific expression of *WNK1* splice variants that are disrupted in the inherited painless neuropathy disorder, HSAN2A.
- Mentor high school and college students in lab techniques, data analysis, and poster creation/presentation.

Johns Hopkins University, Baltimore, MD
Woodrow Wilson Fellow, January 2019 – May 2022
Grant awarded for independent project investigating the effects of reduced reelin expression in the entorhinal cortex of aged rats in the context of age-related cognitive decline.

- Developed an analogous Go/No Go task to test response inhibition in Schizophrenia mouse models.
- Used DREADDs in the dorsal Anterior Cingulate Cortex of the mouse to measure sustained visuospatial attention in a five-choice serial reaction time task.
- Validated the Neuronal Pentraxin Receptor (NPTX2) as a biomarker for cognitive decline in male and female rats based on memory performance in the Morris Water Maze.
- Demonstrated that reelin expression is reduced in layer II of the lateral but not the medial entorhinal cortex of both male and female aged, impaired rats.

GRANTS

National Training Grant
August 2024 – May 2026

University Undergraduate Research Fellowship (previously named Woodrow Wilson Fellowship)
May 2019 – April 2022

- One of 15 students awarded $10,000 for an independent research project.
- Independently created, presented, and maintained a multi-year budget to support a research project.
- Orally presented the project at the National Conference for Undergraduate Research and as a poster at the Johns Hopkins DREAMS symposium.

PUBLICATIONS

Webler RD, **King DM,** Balderston NL, Siddiqi SH (2025). Using causal network mapping to clarify pre-clinical brain stimulation results: A reverse-translation approach. Neuropsychopharmacology..

King DM*, Sapio MR*, Maric D, Shah SR, Talbot TL, Manalo AP, Nara P, Ma W, Ghetti A, Ramsden CE, Iadarola MJ, Mannes AJ (2025). Efficient removal of naturally-occurring lipofuscin autofluorescence in human nervous tissue using high-intensity white light. The Journal of Pain. *equal contribution

Staedtler ES, Sapio MR, **King DM**, Maric D, Ghetti A, Mannes AJ, Iadarola MJ (2024). Differential expression of transcripts for the μ-opioid receptor in human nociceptive neurons indicates functionally distinct populations. Cell Reports Medicine.

Sapio MR, Staedtler ES, **King DM**, Maric D, Jahanipour J, Ghetti A, Jacobson KA, Mannes AJ, Iadarola MJ (2024). Analgesic candidate adenosine A3 receptors are expressed by perineuronal peripheral macrophages in dorsal root ganglion and spinal cord microglia in humans. PAIN.

Sapio MR, **King DM**, Staedtler ES, Maric D, Jahanipour J, Kurochkina NA, Manalo AP, Ghetti A, Mannes AJ, Iadarola MJ (2023). Expression pattern analysis and characterization of the hereditary sensory and autonomic neuropathy 2A (HSAN2A) gene With no Lysine Kinase (WNK1) in human dorsal root ganglion. Experimental Neurology.

PRESENTATIONS

Oral Presentations

King D., Sapio M., Staedtler E., Maric D., Jahanipour J., Ghetti A., Jacobson K., Iadarola M., Mannes A. (April 2024). *Molecular-cellular analysis of macrophage-like perineural cells in human dorsal root ganglion tissue.* Oral presentation given at the Annual Meeting of the US Association for the Study of Pain, Seattle, WA. (by invitation)

King D., Branch A., Gallagher M. (April 2022). *Reelin as a medial temporal lobe marker of age-related cognitive decline in male and female rats*. Oral presentation given at the Annual Meeting of the National Conference on Undergraduate Research.

Poster Presentations

King D., Sapio M., Staedtler E., Maric D., Jahanipour J., Ghetti A., Jacobson K., Iadarola M., Mannes A. (May 2024). *Molecular-cellular analysis of macrophage-like perineural cells in human dorsal root ganglion tissue.* Poster presented at the NIH Post Baccalaureate Poster Day, Bethesda, MD.

King D., Sapio M., Staedtler E., Maric D., Jahanipour J., Ghetti A., Jacobson K., Iadarola M., Mannes A. (April 2024). *Molecular-cellular analysis of macrophage-like perineural cells in human dorsal root ganglion tissue.* Poster presented at the Annual Meeting of the US Association for the Study of Pain, Seattle, WA.

King D., Sapio M., Maric D., Ghetti A., Ramsden C., Iadarola M., Mannes A. (November 2023). *Prototyping high intensity light for fluorescence-compatible removal of lipofuscin-derived autofluorescence in human nervous tissue.* Poster presented at the Annual Meeting of the Society for Neuroscience, Washington D.C.

King D., Sapio M., Maric D., Ghetti A., Ramsden C., Iadarola M., Mannes A. (September 2023). *Efficient removal of naturally occurring lipofuscin-derived autofluorescence in human nervous tissue using high intensity white light.* Poster presented at the NIH Research Festival, Bethesda, MD.

King D., Sapio M., Maric D., Ghetti A., Iadarola M., Mannes A. (April 2023). *Efficient removal of naturally occurring autofluorescence from human dorsal root ganglion tissue using high intensity white light.* Poster presented at the NIH Post Baccalaureate Poster Day, Bethesda, MD.

King D., Sapio M., Maric D., Ghetti A., Iadarola M., Mannes A. (April 2023). *Efficient removal of naturally occurring autofluorescence from human dorsal root ganglion tissue using high intensity white light.* Poster presented at the Annual Meeting of the US Association for the Study of Pain, Durham, NC.

King D., Branch A., Gallagher M. (May 2022). *Reelin as a medial temporal lobe marker of age-related cognitive decline in male and female rats*. Poster presented at the Johns Hopkins University DREAMS Symposium. Baltimore, MD.

VOLUNTEER AND CLINICAL EXPERIENCE

Johns Hopkins Bayview Hospital, Department of Neurosurgery

Medical shadowing student, January 2019 -March 2020

- Shadowed Dr. Judy Huang (Vice Chair of Neurosurgery at Johns Hopkins Hospital) in clinics and surgeries (including Chiari decompression, shunt replacement, skull reconstruction, AVM removal).
- Shadowed the corresponding clinics and follow ups to patient's surgery.

Kennedy Krieger Institute, Therapeutic Recreation Department
Student volunteer, June 2019 – March 2020

- Engaged with neurologically impaired patients (1 – 15 years old) to help improve social, problem solving, and dexterity skills.
- Played (board games, sports etc.) with patients, monitored more risk-prone patients (young children and heavily mentally impaired), assisted with homework assignments and generally socialized.

TEACHING AND MENTORING EXPERIENCE

National Institutes of Health, National Center for Complementary and Integrative Health, Bethesda, MD
Assistant lecturer, January 2023 – June 2024

- Presented one lecture introducing clinical and research approaches to pain including its measurement, treatment, and quantification.
- Assist lecturers in topic and speaker introductions, moderating audience discussion/questions, and lecture preparation.

Streamline Tutors
SAT tutor, March 2019 – March 2020

- Met with and maintained consistent communication with parents of students
- Tutored SAT curriculum on weekly or biweekly basis
- Average student improvement of between 200-250 points from baseline