

Daniel C. Brock

2021-2022 MD/PhD Applicant

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720-425-0917

AAMC ID: 15075724

Interests: Genetics, bioinformatics, neurodegeneration, mitochondria, aging, nutrition, and precision medicine.



Education and Test Scores

University of Washington, Seattle, WA

B.S. with Honors and Distinction

Biochemistry, Molecular Cellular & Developmental Biology

cGPA: 3.80, sGPA: 3.78

MCAT: 524 (132, 129, 132, 131)

Aug/2015 – Jul/2019

Research Positions

Swaroop Lab, *Retinal Development Genetics & Therapy Section, NEI-NIH*, Bethesda, MD

Postbac IRTA Fellow. Uncovering the role of diet in the epigenetic and transcriptomic aging process in the retina.

Kaplan Lab, *Pediatric Oncology Branch, NCI-NIH*, Bethesda, MD

Postbac CRTA Fellow. Genetically engineering mesenchymal stem cells with extracellular matrix remodeling enzymes to target the tumor microenvironment of pancreatic cancer.

Brockerhoff Lab, *Department of Biochemistry, University of Washington*, Seattle, WA

Undergraduate Research Assistant. Measuring calcium flux in the retinal photoreceptor mitochondria. Tracking circadian gene expression changes in zebrafish cone photoreceptors.

Apr/2020 – Present

Sep/2019 – Apr/2020

Aug/2017 – Jul/2019

Clinical Experience

Shadowing: Clinical Center, NIH, Bethesda, MD

Henry Masur, MD – infectious diseases: 15 hours

Rosandra Kaplan, MD – pediatric oncology: 12 hours

Les Folio, MD – Radiology: 32 hours

Emily Chew, MD – Ophthalmology (virtual): 21 hours

Sorrer Lab, *Clinical Research Division, Fred Hutch*, Seattle, WA

Summer Volunteer Intern. Monitoring the mental and physical health of elderly acute myeloid leukemia patients. 700 hours

University of Washington Medical Center, Seattle, WA

Helped transport patients between various units, delivered gifts, and stocked hospital supplies. 252 hours

Oct 2019 – Present

May/2016 – Nov/2016

Dec/2015 – May/2017

Publications

1. Smith, A. J., Advani, J., **Brock, D. C.**, Nellissery, J., Gumerson, J. D., Dong, L., Aravind, L., Kennedy, B., & Swaroop, A. (Under revision). DJ-1 like protein GATD3A repairs glyoxal glycation damage preventing AGE accumulation in mitochondria. Currently under revision in *Cell Reports*.
2. Giarmarco, M. M., **Brock, D. C.**, Robbins, B. M., Cleghorn, W. M., Tsantilas, K. A., Kuch, K. C., Ge, W., Rutter, K. M., Parker, E. D., Hurley, J. B., & Brockerhoff, S. E. (Nov 2020). Daily mitochondrial dynamics in cone photoreceptors. *Proceedings of the National Academy of Sciences of the United States of America*, 117(46), 28816–28827. <https://doi.org/10.1073/pnas.2007827117>
3. Hutto, R. A., Bisbach, C. M., Abbas, F., **Brock, D. C.**, Cleghorn, W. M., Parker, E. D., Bauer, B. H., Ge, W., Vinberg, F., Hurley, J. B., & Brockerhoff, S. E. (Aug 2019). Increasing Ca²⁺ in photoreceptor mitochondria alters metabolites, accelerates photoresponse recovery, and reveals adaptations to mitochondrial stress. *Cell Death & Differentiation*, 27(3), 1067–1085. <https://doi.org/10.1038/s41418-019-0398-2>

Presentations

1. **Brock, D.C.**, Smith, A. J., Advani, J., Nellissery, J., Gumerson, J., Swaroop, A. *Function of the Novel Mitochondrial Deglycase Enzyme GATD3A in the Mouse Retina*. Virtual poster presented at the Association for Research in Vision and Ophthalmology (ARVO), (April 2021).
2. **Brock, D.C.**, Smith, A. J., Advani, J., Nellissery, J., Gumerson, J., Swaroop, A. *Function of the Novel Mitochondrial Deglycase Enzyme GATD3A in the Mouse Retina*. Virtual poster presented at Postbac Poster Day at the NIH, Bethesda, MD (April 2021).
3. **Brock, D. C.** *A Multi-Omics Study of how Dietary Choices Modulate the Epigenome of Aging Mouse Retinas*. Virtual talk given at the Postbac Seminar Series at the NIH, Bethesda, MD (Feb 2021).
4. **Brock, D. C.**, Sowder, M. E., Ju, W., Kaplan, R. N. *Understanding Common Signaling Axes in Osteosarcoma to Target Tumor Cells and the Microenvironment*. Virtual poster presented at Postbac Poster Day at the NIH, Bethesda, MD (April 2020).
5. Giarmarco, M. M., **Brock, D. C.**, Cleghorn, W. M., Tsantilas, K. A., Rutter, K. M., Robbins, B. M., Kuch, K. C., Ge, W., Evans, A., Parker, E., Hurley, H. B., Brockerhoff, S. E. *A day in the life of a photoreceptor: Mitochondrial dynamics support daily energy demands*. Poster presented at the University of Washington Biochemistry Retreat, Bainbridge Island, WA (Sep 2019).
6. **Brock, D. C.**, Giarmarco, M. M., Cleghorn, W. M., Tsantilas, K. A., Kuch, K. C., Ge, W., Brockerhoff, S. E. *Circadian Mitochondrial Dynamics in Zebrafish Cone Photoreceptors*. Poster presented at the University of Washington Undergraduate Research Symposium, Seattle, WA (May 2019).
7. **Brock, D. C.**, Giarmarco, M. M., Cleghorn, W. M., Tsantilas, K. A., Ge, W., Brockerhoff, S. E. *Mitochondrial Biogenesis in Zebrafish Cone Photoreceptors*. Poster presented at the Association for Research in Vision and Ophthalmology (ARVO), Vancouver, BC (April 2019).

8. **Brock, D. C.**, Hutto, R. A., Bisbach, C. M., Brockerhoff, S. E. *Ca²⁺ Regulation in the Retinal Mitochondria*. Poster presented at the University of Washington Undergraduate Research Symposium, Seattle, WA (May 2018).

Volunteering and Community Service

Silver Spring Village , Silver Spring, MD	May/2020 – Present
Delivered food and prescriptions to elderly during the pandemic	
Maskeraid and Johns Hopkins University , Baltimore, MD	Apr/2020 – Present
Emergency PPE manufacturing and delivery	
Montgomery Parks , Bethesda, MD	Jan/2020 – Present
Maintained local trails and parks in Montgomery County	
Washington Trails Association , Seattle, WA	Jul/2016 – Sep/2018
Maintained Blanca Lake Trail in the Cascade Mountains	

Leadership

Postbac Committee , Bethesda, MD	Mar/2021 - Present
Chair	
University of Washington Pre-Physician Scientist Club , Seattle, WA	Jul/2020 – Present
Founder and Alumni Leader	
NIH Bike Club, NIH Hiking Club, NIH Movie Club , Bethesda, MD	May/2020 – Present
Founder and President	
NIH Postbac Seminar Series , Bethesda, MD	
Co-chair	
University of Washington Undergraduate Research Leader , Seattle, WA	Sep/2018 – Jun/2019

Grants and Awards

Office of Dietary Supplements Grant (\$100k), coauthored a research grant with a postdoc in the Swaroop Lab.	Oct/2020 – Present
Cum Laude , University of Washington	Jun/2019
Distinguished Research in Biochemistry Award , University of Washington	Jun/2019
Undergraduate Research Travel Award (\$500), University of Washington, recipient and first author	Apr/2019
Levinson Scholarship (\$7000), University of Washington, recipient and first author	Sep/2018 – Jun/2019