Daniel C. Brock

2021- 2022 MD/PhD applicant

Interests: Genomics and bioinformatics in aging and disease

cGPA = 3.81, sGPA = 3.78

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

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Education

**B.S. Biochemistry with Honors, B.S. Molecular, Cellular, and Developmental Biology, Minor in Chemistry | University of Washington, 2019**

Research

**Postbaccalaureate IRTA Fellow | National Eye Institute | Swaroop Lab | May 2020 – Present**

* Uncovering the role of diet in the epigenetic aging process in the retina. What is the molecular mechanism of aging when mice are exposed to different diets composed of substantially different nutritional contents?

**Postbaccalaureate CRTA Fellow | National Cancer Institute | Kaplan Lab | Sep 2019 – April 2020**

* Genetically engineering mesenchymal stem cells with hyaluronidase to target the dense stroma of pancreatic cancer. Do mesenchymal stem cells overexpressing hyaluronidase target the tumor microenvironment and do they ameliorate drug resistance seen in pancreatic cancer?
* Developed a mouse model for metastatic osteosarcoma antibody blocking therapy. Does dual blockade of PDGFRα and CD47 limit metastatic progression of osteosarcoma?

**Undergraduate Research | University of Washington | Brockerhoff Lab | Aug 2017 – July 2019**

* Measuring calcium flux in the retinal mitochondria. How do cone photoreceptors regulate their mitochondrial calcium transporters to maintain calcium homeostasis?
* Tracking circadian gene expression changes in zebrafish cones. Does mitochondrial biogenesis in cones follow a circadian rhythm, or is it dependent on light exposure?

**Summer Research Intern | Fred Hutchinson Cancer Research Center | May 2016 – Nov 2016**

* Monitoring the mental and physical health of acute myeloid leukemia patients undergoing chemotherapy. How does chemotherapy impact the cognitive and physical health of AML patients?

Publications

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. Increasing Ca2+ in photoreceptor mitochondria alters metabolites, accelerates photoresponse recovery, and reveals adaptations to mitochondrial stress. *Cell Death Differ* (2019). <https://doi.org/10.1038/s41418-019-0398-2>

Michelle, G.M., **Brock, D.C**., Cleghorn, W.M., Kuch, K.A., Ge, W., Tsantilas, K.A., Rutter, K.M., Parker, E.D., Hurley, J.B., Brockerhoff, S.E. Mitochondrial dynamics support nightly energy demands in photoreceptors. *Procedings of the National Academy of Sciences* (2020). <https://doi.org/10.1073/pnas.2007827117>

Shadowing

**NIH Clinical Center (70 hours) | October 2019 – Present**

* Pediatric oncologist (12 hours), pulmonologist (12 hours), radiologist (28 hours), Ophthalmologist (20 hours).

Volunteering

**COVID-19 Response (50 hours) | Maskeraid, JHU, and Silver Spring Village | April 2020 – Present**

* Mask and PPE production with Maskeraid, an NIH postbac-led initiative, and at Johns Hopkins University. Delivered groceries and prescriptions to the elderly at Silver Spring Village.

**Undergraduate Research Leader (60 hours) | University of Washington | Sep 2018 – June 2019**

* Spoke with freshmen and community college transfer students about how to get involved in research. Reviewed abstracts, designed flyers, and set up Mary Gates Hall for the University of Washington undergraduate research symposium.

**Hospital Volunteer (250 hours) | University of Washington Medical Center | Jan 2016 – May 2017**

* Volunteered at the University of Washington Medical Center where responsibilities included transporting patients, stocking hospital supplies, and delivering gifts.

Awards and Honors

**2018-2019 Levinson Scholar | University of Washington**

**Undergraduate Research Travel Award | University of Washington | 2019**

**Distinguished Research in Biochemistry Award | University of Washington | 2019**

**Cum Laude | University of Washington | 2019**