

ACS FELLOW NAME, DEGREE (working toward or received):

Isaiah Michael Waiters, B.S. in Nutritional Science, Howard University.

Certificate in Cancer Studies, Case Western Reserve University, expected May 2026

NAME OF SPONSORING INSTITUTION: Case Western Reserve University

FELLOWS MENTOR(S):

Jason Mears, PhD, Professor, Pharmacology, Case Western Reserve University
Associate Director for Training and Education, Case Comprehensive Cancer Center
Member, Molecular Oncology Program, Case Comprehensive Cancer Center

DESCRIPTION OF THE FELLOWS' RESEARCH PROJECT AND PROGRESS:

During my fellowship, I worked to elucidate the molecular mechanisms that regulate mitochondrial fission through the dynamin-related protein DRP1. My work specifically examines how disease-associated mutations in DRP1 alter its oligomerization, enzymatic activity, and structure–function relationships relevant to mitochondrial dynamics in cancer and metabolic disease. The project is significant because dysregulated mitochondrial fission is increasingly recognized as a contributor to tumor progression and therapeutic resistance.

Key milestones achieved include generating and characterizing mutant DRP1 constructs, optimizing protein expression and purification workflows, and applying biochemical and biophysical assays to assess oligomeric state, nucleotide-dependent assembly, and GTPase activity. I have also integrated imaging and functional assays to connect molecular phenotypes with mitochondrial behavior. Currently, I am completing comparative analyses across multiple DRP1 mutants and refining experiments to link biochemical defects with functional outcomes. Before finishing the program, I plan to finalize data collection, contribute to manuscript preparation, and help position the project for publication.

CAREER DEVELOPMENT ACTIVITIES (E.G., INDIVIDUALIZED COURSEWORK OR WORKSHOPS

ATTENDED): My Individual Development Plan (IDP) served as a framework to guide my scientific training and career choices throughout the fellowship. I frequently revised my IDP with my mentor to evaluate my progress toward specific milestones, including technical, research, and communication skills, and aligning them with my long-term goal of becoming a physician-scientist. As a consequence of this process, I elected to pursue advanced training in protein biochemistry, mitochondrial biology, and experimental design, while also incorporating career development activities, including MCAT preparation, physician shadowing, and participating in national training programs. The IDP helped me to prioritize conference presentations, leadership roles within the ACS postbaccalaureate network, and enrollment in specialized cancer-focused coursework.

During my fellowship, I participated in a range of career development activities. These included graduate- and cancer-focused coursework at Case Western Reserve University, research seminars in the Case Comprehensive Cancer Center, and national workshops such as the Jackson Laboratory/ACS Cancer Course, where I was selected as a Rising Star Speaker. I also attended journal clubs, scientific writing workshops, grant-focused seminars, and lunches with national cancer experts.

I completed the Kaplan MCAT Preparatory course that included a multi-month curriculum with content review, practice exams, and strategy sessions. Through this preparation, my performance improved from 486 (12thile) to 504 (62ndile), improving my medical school applications. Additional activities included meetings with leaders of MD and MD/PhD training programs, interview preparation sessions, and leadership roles within the ACS postbaccalaureate community at both the local and national levels.

During the fellowship, I served as a mentor through multiple outreach and training initiatives. I was a STEM Outreach Leader in the Youth Engaged in Science (YES) Program, where I mentored high school students from underrepresented backgrounds through hands-on cancer research activities and discussed various careers in STEM. I was also an informal mentor to junior trainees within the laboratory and supported peer mentoring efforts across the ACS postbaccalaureate network.

PUBS/MANUSCRIPTS CO-AUTHORED: (See instructions for more information):

I am a co-author on a manuscript that has been conditionally accepted for publication, pending revisions. It is titled "*The Identification of DRP1 Patient Mutations that Limit Interactions with MFF.*" My specific contributions included the generation and purification of mutant proteins, the execution of biochemical and biophysical assays, and data analysis.

I am working on a second manuscript that will describe the structural and functional consequences of closely spaced threonine mutations in DRP1. This work builds directly on my fellowship research and will further reveal how subtle alterations in DRP1 regulate mitochondrial fission.

CONFERENCE PRESENTATIONS: (See instructions for more information):

I presented my work at multiple local and national conferences, including poster presentations at the Case Comprehensive Cancer Center Annual Retreat (October 2025, Cleveland, OH), the Annual CMRT Symposium (November 2025, Cleveland, OH), and ABRCMS (November 2025, San Antonio, TX), where I received a poster award. I also delivered an oral presentation at the ACS Post-baccalaureate Annual Trainee Meeting (September 2025, Atlanta, GA) where I won a people's choice award and was selected as a Rising Star Speaker at Jackson Laboratory Annual Short Course on Experimental Models of Human Cancer (August 2025, Bar Harbor, ME).

HONORS, AWARDS, FELLOWSHIPS, AND ANY OTHER SUPPORT RECEIVED DURING THE PERIOD OF TRAINING:

Honors and awards during my training include a Poster Award at ABRCMS (2025), a Presentation Award at the ACS Post-baccalaureate Annual Trainee Meeting (2025), selection as a trainee for the Jackson Laboratory Annual Short Course on Experimental Models of Human Cancer (2025), and recognition as a Featured Scholar in Think: The Magazine of Case Western Reserve University (2025). I was also accepted to the United States Army Health Professions Scholarship Program (2026).