

Kristyn A. Carter, MSc PhD

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Molecular, Cellular, and Developmental Biology
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EDUCATION

Postdoctoral researcher, Yale University, October 2021-October 2024

My postdoctoral studies are being undertaken in the lab of Associate Professor Valerie Horsley and my work focus on understanding how biomaterials can be used to mediate successful wound healing in diabetic, type I & II, mice. The techniques I use include induction of diabetes in mice, murine skin wounding, flow cytometry, cell sorting, immunofluorescent staining of wound beds and whole tissue mounts, and quantitative polymerase chain reaction (qPCR). Additional work performed during my postdoc include acting as a teaching assistant and providing curriculum support for 'Human Biology: Research methods, questions, and societal impact' and 'Biology of Humans through History, Science, and Society.'

Doctor of Philosophy (PhD) in Immunology, University of Glasgow October 2018-April 2022

My PhD focuses on understanding the underlying immune mechanisms of Dupuytren's disease. Using Dupuytren's and carpal tunnel tissue, I performed flow cytometry, immunohistochemistry, ELISA, tissue culture, RNA extraction, and real time quantitative polymerase chain reaction (RT-qPCR). I also coordinate weekly lab meetings between my lab group and three others. During my PhD, I founded the organization Minorities in Science, Technology, Engineering, Arts, and Mathematics (MiSTEAM). My organization focuses on fostering a network of support for those underrepresented in their field. I am also the postgraduate representative on the University of Glasgow Equality and Human Rights Commission (EHRC) Tackling Racism Working Group and Race Equality Group (REG).

Master of Science (MSc) in Immunology and Inflammatory Disease, University of Glasgow September 2017- September 2018

The courses I took included: molecular research skills, immunology, and inflammation, designing a research project, frontiers in cancer science, animal models of disease, in vitro models in neuroscience and neuroinflammation. I wrote an extended essay based on the science presented in the Mucosal Immunity session of the 2017 British Society of Immunology. During the summer of 2018, I studied soft tissue injury and the impact of treatment with adipose derived stem cells on the repair process of damaged tendon and ligament cells in vitro. I was also one of the class representatives for this course and I am completed the Medical, Veterinary, and Life Sciences (MVLS) Graduate award.

Bachelor of Arts (BA) in Biochemistry and Mathematics, Mount Holyoke College August 2013- May 2017

Located in Massachusetts, USA, I majored in Biochemistry and minored in Mathematics. I conducted research in Neuroscience and Mathematics and presented my work at undergraduate research symposiums.

ADDITIONAL RESEARCH EXPERIENCE

Assessing injury and repair of soft tissue, supervised by Professor Neal Millar, May 2018-August 2018

- This work was conducted under the supervision of Mr. Neal Millar for the research component of my master's thesis. My thesis assessed the healing capabilities of adipose derived stem cells (ADSC) on damaged tendon and ligament cells *in vitro*. The techniques practiced were qPCR, flow cytometry, and ELISA.

The influence of genetic diversity on rescue behavior in the polyandrous ant, *Cataglyphis Cursor*, supervised by Dr. Karen Hollis, March 2015-May 2017

- Conducted at Mount Holyoke College, in collaboration between the Department of Neuroscience and the Department of Biology, I extracted DNA from the *Cataglyphis Cursor* ant, performed PCR and gel electrophoresis to amplify the suspected gene of interest. The samples were sequenced by Cornell University's Biotechnology laboratory and returned to the Hollis lab to be assessed using Peak Scanner Software and Colony Parentage and Sibship program. The results indicated a genetic linkage between patriline, and the role performed by the ant within the colony. This work was published in February 2020 in the Journal of Experimental Biology.

Vaginal microbiome in health and disease. Supervised by Dr. Robert Akins, Ph.D., May 2016-September 2016

- Working at Wayne State University School of Medicine, USA, I plated and cultured vaginal samples on blood media containing metronidazole to evaluate the relationship between dose level and recovery from bacterial vaginosis. Using qPCR and gel electrophoresis, amplification of lactobacilli was analyzed via phylogenetic branch-inclusive primers and sequencing of amplicons generated with oligomers that block lactobacilli amplification.

America's history of exploitation of Black Americans for medical advancements. Supervised by Dr. Catherine Manegold, Ph.D., 2016-2017

- I performed a literature-intensive study of the history of medicine from the late 1800's to the early 1990's. This study ended with me writing a 10-page thesis and submitting a syllabus, to Mount Holyoke College, for a course centered around the history of medicine.

Exploring the Black Superwoman Complex. Supervised by Dr. Lucas Wilson, Ph.D., 2016- 2017

- A continuation of my Black studies, this work focused on exploring the image of Black women beginning with slavery and ending with the hip-hop movement in the 1990's. In conclusion, I wrote three essays over the course detailing my interpretation of the collection of literature and I presented my findings at Mount Holyoke College's Senior Symposium.

PUBLICATIONS

1. Akbar, M., Crowe, L. A. N., McLean, M., Garcia-Melchor, E., MacDonald, L., Carter, K., Fazzi, U. G., Martin, D., Arthur, A., Reilly, J. H., McInnes, I. B., & Millar, N. L. (2021). Translational targeting of inflammation and fibrosis in frozen shoulder: Molecular dissection of the T cell/IL-17A axis. *Proceedings of the National Academy of Sciences*, 118(39).
2. Andras, J. P., Hollis, K. L., Carter, K. A., Couldwell, G., & Nowbahari, E. (2020). Analysis of ants' rescue behavior reveals heritable specialization for first responders. *Journal of Experimental Biology*, 223(5).

AWARDS

ABRMCS conference judge fund, September 2022

- Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) travel fund of \$1,500 was awarded to selected judges Hudson River Undergraduate Mathematics Research Symposium, 2017
- Westfield State University, located in Massachusetts, USA, hosted a conference for undergraduate mathematicians to present their research in a 15-minute talk. Students were then invited to speak with professors about their work and how to apply their undergraduate work in a graduate, academic environment.

Lynk Universal Application Funding (UAF), 2016

- I applied to the Lynk foundation to fund my summer research with Dr. Akins at Wayne State University School of Medicine. I was awarded \$3,000 and in return I presented my work to first- and second-year students to encourage and advise them to apply for research funding.

Brandeis University Undergraduate Research Symposium, 2016

- Brandeis University, in Massachusetts, USA, hosted an undergraduate research symposium where students submitted their abstracts and 30 were chosen to present their work in poster session. In the neuroscience category, I received honorable mention for my work and presentation.

Worcester Polytechnic Institute Undergraduate Research Symposium, 2016

- Worcester Polytechnic Institute, in Massachusetts, USA, hosted a symposium and open house for their master's program. After being chosen to present my work at their poster session, I was awarded honorable mention in the overall science category.

Harap Fund, 2015-2017

- This is an undergraduate research fund provided by the Harap family. After applying and providing an outline for what the fund would cover, I was awarded \$300 in 2015-2016 and \$500 in 2016-2017 academic year.

ORAL PRESENTATIONS

British Society of Immunology, 2019

LEADERSHIP EXPERIENCE

Chair of Yale Black Postdoctoral Association (YBPA), 2022-2024

Chair of Gordon Research Seminar (GRS): Epithelial stem cells and their niches, 2022-2024

Yale Molecular, Cellular, and Developmental Biology DEI committee, 2022-2023

Founder of Minorities in Science, Technology, Engineering, Arts, and Mathematics (MiSTEAM), July 2020

CLINICAL EXPERIENCE

Gartnavel General Hospital, Glasgow, U.K., September 2019-January 2020

- Shadowed Mr. Neal Millar, Mr. Nasir Hussain, and Mr. Chambers perform Dupuytren's fasciectomy, carpal tunnel fasciotomy, extensor tendon repair, trapeziectomy, excision of ganglion, excision of gouty tophi, repair of ulna collateral ligament, cubital tunnel release, ulna shortening, cubital carpal tunnel release, ulna shortening, arthroscopic SLAP repair of the shoulder, and arthroscopic rotator cuff repair.

St. Joseph Mercy Oakland Hospital, Michigan, USA, 2011- 2015

- I assisted in aiding patients that were recovering from surgery and shadowed surgeons on their rounds to the patient's rooms.

Gasow Animal Hospital, Michigan, USA, June 2015-August 2015

- I shadowed Dr. James Wright and aided him in performing musculoskeletal surgery on dogs.

Summer Medical and Dental Educational Program (SMDEP), Ohio, USA, June 2014-August 2014

- After applying SMDEP, I was chosen to be one of the 20 students to live and study at Case Western University for which I was given a stipend for the duration of the program. I also shadowed surgeries, conducted research, and attended seminars.

Child Family Health International, New Delhi, India, December 2015-January 2016

- I applied to perform clinical work abroad through a US-based organization. During my time in India, I attended clinical rotations alongside Dr. Anish Patel to aid in providing medical checkups. I also spent time with Dr. Bindeshwar Pathak, the founder of Sulabh International, and immersed myself in understanding the importance of sanitation and its effects on a community's health.

TEACHING EXPERIENCE

Teaching associate, Yale University, January 2022-current

- I am a consult and teaching assistant for Human Biology: Research methods, questions, and societal impact. In addition to leading discussions relating to racism being embedded within science and medicine, I also advisor the instructors on the how to engage in productive, tactful discussion of difficult topics.

Demonstrator, University of Glasgow, October 2019-September 2021

- I taught undergraduate students for Molecular methods, Biology 1B, Biology 2X, and the Equality and diversity course. I also mark exams for the following undergraduate courses: Biology 1B, Biology 2X, and Sports science.

Teaching Assistant, Mount Holyoke College 2016-2017

- I worked in a Biochemistry laboratory where I prepared reagents for the lab sessions and ensured that each lab bench contained the proper tools to complete the experiments. Additionally, I attended lab sessions to provide support for the students and instructed them on the proper way to perform thin layer chromatography, gel electrophoresis, nuclear magnetic resonance, and gas chromatography.

MENTORSHIP EXPERIENCE

Yale University

- Carlos Hurtado-Muñoz, July 2022-August 2022
 - Yale Summer Enrichment Research Experience (SERE)

University of Glasgow

- Anna Sanders, June 2021-August 2021
 - University of Glasgow, Masters of Immunology student
- Hussain Master, January 2020-April 2020
 - University of Glasgow, School of Medicine research student
- Ellen Main, September 2019-December 2019
 - University of Glasgow, Bachelor of Science Undergraduate Research Student
- Meg Parbrook, June 2019-August 2019
 - University of Glasgow, School of Medicine summer research student
- Sophie Worsford, June 2019-August 2019
 - University of South Wales, summer exchange research student

EDITORIAL & REVIEWER EXPERIENCE

US editorial intern, Elsevier, September 2022-December 2022

- Manuscript oriented internship focused on how scientific research goes from submission to publication, and collaborate with other teams across the editorial, production, communication, and marketing departments.

Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS), abstract reviewer, September 2022-November 2022

Gordon Research Seminar, Endothelial Stem Cells and their niches Conference 2022, organizer and abstract reviewer, May 2022

Summer Biomechanics, Bioengineering, and Biotransport Conference 2022, PhD abstract presentation review, January 2022