

CHRISTINA A. DEL CARPIO

pronouns: they/them

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EDUCATION

- Ph.D. Candidate in Ecology and Evolutionary Biology 2017 – Present
 - University of California, Los Angeles (UCLA)
 - Mentor: Kirk E. Lohmueller
- B.S. Biology and Evolutionary Anthropology with Distinction 2007 – 2011
 - Duke University, Durham, NC
 - 3.428 GPA (4.0 Scale)

RESEARCH EXPERIENCE

UCLA Department of Ecology and Evolutionary Biology

- **Does UCLA's Competitive Edge Program Provide an Edge?** 2020 – Present
My goal is to identify the impact of UCLA's Competitive Edge program. Competitive Edge is a selective summer transition program for incoming doctoral students from underrepresented backgrounds. I will apply quantitative and qualitative research methods to assess how program participants progress in their PhD program vs similar students who did not participate. This work will examine what benefits students receive from the program and what program elements have the highest impact on student success.
- **Building a High Resolution Recombination Map for the North American Gray Wolf (*Canis lupus*)** 2019 – Present
My research is leveraging the through pedigree of wolves in Yellowstone National Park to generate a detailed recombination map. By applying a pedigree-based method, I will be able to map locations of recombination from directly observable events between parents and offspring. My work will provide a fine-scale recombination map for a wild population.
- **The Evolutionary Patterns of Recombination Rates in North American Gray Wolves (*Canis lupus*) and Domestic Dogs (*Canis familiaris*)** 2019 – Present
The aim of my research is to use population level genetic data to estimate the location and intensity of recombination in the gray wolf and breed dogs. Beyond generating recombination maps for these two species, I will test the hypothesis that domestication has selected for increased recombination rates in dogs relative to their wild progenitor of wolves.
- **Application of CRISPR-Cas9 Edited Cells to Evaluate Gene Function in the North American Gray Wolf (*Canis lupus*)** 2018 - 2019
I led research using immortalized cells from a North American grey wolf (*Canis lupus*) that were edited with CRISPR-Cas9 at the canine-beta-defensin-103 (*CBD103*) locus. The goal of this work was to functionally assay if a mutation in the *CBD103* gene impacts antimicrobial activity of wolf keratinocytes. I adapted a bacteria-killing assay previously used by others to challenge human keratinocytes to be used to challenge these wolf keratinocyte lines. This work provides a model for how CRISPR-Cas9 technology can be leveraged to study genotype-phenotype relationships in non-traditional model systems.

RESEARCH EXPERIENCE (CONTINUED)**Duke University Department of Evolutionary Anthropology**

- **Laboratory Manager for Tung Lab** 2016 - 2017
I planned and executed state-of-the-art molecular lab techniques for multiple projects, primarily focused on studying the genomics and epigenomics of non-human primates. A major accomplishment for which I played a lead role in wet-lab work was the development of a novel method, mSTARR-seq, to assess genome-wide effects of DNA methylation on gene regulation. Techniques used included RNA-sequencing (RNA-seq), genomic library construction, sample preparation for high-throughput sequencing, reduced representation bisulfite sequencing (RRBS), assay for transposase-accessible chromatin sequencing (ATAC-seq), transformation, transfection, and general cell culture.
- **Behavioral Thermoregulation in Two Genera: *Lemur* and *Varecia*** 2010 - 2011
I completed a senior thesis of original research focused on a comparative study of the behavioral thermoregulation of ringtailed lemurs (*Lemur catta*) and ruffed lemurs (*Varecia variegata* and *V. rubra*). I successfully secured three sources of funding for my project: Duke Deans' Summer Fellowship, a Molly Glander Award, and a Duke Undergraduate Research Support Grant. I also applied for an addition to and worked under an existing IACUC protocol. Comparative results support that these three lemur species undergo different levels of heat stress due to coat density and color as reflected in different behavioral patterns across temperature ranges. This work provides insight into how these species respond and cope with changes in temperature, which is of particular concern as we see the mounting impacts of climate change. Additionally, my findings are of interest to researchers across disciplines as lemurs represent a branch of the primate phylogeny that retains many primitive characteristics shared by an early, primate common-ancestor, potentially providing insights into human and other primate origins.

TEACHING EXPERIENCE**University of California, Los Angeles**

- **Reader for Life Sciences 110: Career Exploration in the Life Sciences** Fall 2018 and 2019
I facilitated in-class discussions by engaging with individual students about the exercises they were completing. The course size was 60 students. Additionally, I provided qualitative feedback on homework assignments such as values assessments, cover letters, and resumes.
- **TA for Ecology and Evolutionary Biology 116: Conservation Biology** Winter 2019
I led two two-hour discussion sections of 20 students (40 students total) each week. I wrote quizzes to assess if students completed the readings. I crafted discussion questions to probe student understanding of each week's topic, challenge students to apply knowledge from lecture, and spark discussion of ethical dilemmas in conservation efforts.

Duke University Department of Biology

- **Laboratory Instructor Biology 201: Introduction to Molecular Biology** Fall 2011 – Spring 2016
I taught four lab sections (total of 64 students) per semester. I collaborated with the team of instructors to create and evaluate student assessments. I performed various administrative duties focusing on course policy. I modeled lab instruction and trained graduate-student teaching-assistants. Molecular techniques I taught include: nucleic acid isolation, polymerase chain reaction (PCR), molecular cloning, gel electrophoresis, and basic local alignment search tool (BLAST).
- **Laboratory Instructor Biology 202: Introduction to Genetics and Evolution** Summer 2015
I taught lab sections twice per week and discussion section once per week (total of 18 students) for one summer session. I collaborated with the team of instructors to create and evaluate student assessments.

TEACHING EXPERIENCE (CONTINUED)**Duke Talent Identification Program (TIP)**

- **Academic Adventures Instructor for Survival of the Fittest** 2013-2017
I designed a new, one-day course for a class of 16 local gifted 5th and 6th grade students taught twice per year. The curriculum is focused on giving students a foundation in the theory of natural selection through hands-on labs.
- **Summer Studies Instructor for DNA: Unlocking the Genetic Code** 2015
I planned and led four days of instruction for a class of 16 gifted students in 7th and 8th grade. Lesson plans included interactive labs, a visit to a genetics research lab, and a collaborative activity with a Cryptography course.
- **Scholar Weekends Instructor for Ecology and Evolution** 2015
I designed a new, two-day course for class of 16 local gifted 8th – 11th grade students taught one weekend. The curriculum is focused on giving students a foundation in evolutionary principles through an ecological lens.

PUBLICATION

- Lea, A. J., Vockley, C. M., Johnston, R. A., **Del Carpio, C. A.**, Barreiro, L. B., Reddy, T. E., & Tung, J. (2018). Genome-wide quantification of the effects of DNA methylation on human gene regulation. *eLife*, 7, e37513.

PRESENTATIONS

- **Del Carpio, C.A.** (2019). Mental Health Concerns Specific to Graduate Students, How Universities Can Respond, and Resources at UCLA. 20 minute talk at UCLA EcoEvoPub Seminar Series. Los Angeles, CA. May 2, 2019.
- **Del Carpio, C. A.**, Johnston, R. A., Rheinwald J.G., Lowry W. E., Tung, J., Wayne R. K. (2019). Application of CRISPR-Cas9 Edited Cells to Evaluate Gene Function in the North American Gray Wolf (*Canis lupus*).
 - 30 minute talk at The Biomedical Big Data Training Program, The Burroughs Wellcome Fund Inter-school Training Program in Chronic Diseases, and The Genomic Analysis & Interpretation Training Program Annual Joint Research Symposium. Los Angeles, CA. May 28, 2019.
 - Poster presented at UCLA Ecology and Evolutionary Biology Research Symposium. Los Angeles, CA. May 22, 2019.
 - Poster presented at annual National Human Genome Research Institute (NHGRI) Trainee Meeting. Saint Louis, Missouri. April 10, 2019.
 - 5 minute lightning talk at UCLA Conservation Genomics Colloquium. Los Angeles, CA. December 10, 2018.
 - 20 minute talk at UCLA EcoEvoPub Seminar Series. Los Angeles, CA. October 25, 2018.
- ***Del Carpio, C. A.**, *Thurlow, L., & Azurdia, D. (2018). Dealing with Imposter Fears. 40 minute workshop at Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) UCLA chapter general body meeting. November 13, 2018.
- Lea, A. J., Vockley, C. M., Johnston, R. A., **Del Carpio, C. A.**, Barreiro, L. B., Reddy, T. E., & Tung, J. (2017). mSTARR-seq: Genome-Wide Assay for the Effect of DNA Methylation on Enhancers.
 - Poster presented at the annual Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Diversity in STEM Conference. San Antonio, TX. October 12, 2018.
 - 20 minute talk at UCLA EcoEvoPub Seminar Series. Los Angeles, CA. May 17, 2018.

PRESENTATIONS (CONTINUED)

- **Del Carpio, C. A.** (2011). A Comparative Study of Behavioral Thermoregulation in Two Genera: *Lemur* and *Varecia*. Poster presented at Visible Thinking – A Presentation of Undergraduate Research. Durham, NC. April 20, 2011.

AWARDS, GRANTS, AND FELLOWSHIPS

- **National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) Fellow (2017- 2018, 2020-2022)**
- Psi Upsilon Graduate Student Scholarship (2020-2021)
- **National Institute of Health (NIH) Genomic Analysis Training Program Training Grant (2019-2020)**
- UCLA Department of Ecology and Evolutionary Biology Departmental Research Grant (2019, 2020)
- Best graduate student poster presenter at UCLA Ecology and Evolutionary Biology Research Symposium (2019)
- Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Diversity in STEM Conference travel scholarship (2018)
- UCLA Department of Ecology and Evolutionary Biology Departmental Travel Grant (2018)
- Best graduate student presenter at UCLA SACNAS Research Slam (2018)
- Psi Upsilon Francis C. Hardie Omicron-Zeta 1918 Award (2010 – 2011)
- Molly Glander Award, “A Comparative Study of Behavioral Thermoregulation in Two Genera: *Lemur* and *Varecia*” (2010 – 2011)
- Duke Undergraduate Research Support Independent Study Grant, “A Comparative Study of Behavioral Thermoregulation in Two Genera: *Lemur* and *Varecia*” (2010)
- Duke Deans Summer Research Fellowship, “A Comparative Study of Behavioral Thermoregulation in Two Genera: *Lemur* and *Varecia*” (2010)

SERVICE

- **Mental Health Working Group Student Climate Survey:** I formed a graduate student group in my department focused on mental health. With a committee of ten students we are administering a student climate survey on issues impacting mental health. Once the survey is complete, I will work with the committee to analyze our results. We will share our results with the department and present suggested interventions to faculty to improve graduate student wellbeing. (2019 – Present)
- **Department Training on Supporting Trans and Non-Binary Students:** I collaborated with the director of the LGBTQ Center at UCLA to tailor a training session on how to support trans and non-binary students for my department. I invited other students who identify as trans and/or non-binary to attend the meeting with the director. Together we shared what specific issues we have seen in the department so that the training could target those concerns. The training will be offered in April 2021 and is mandatory for all EEB faculty and staff. (2021)
- **Psi Upsilon Graduate School Career Panel:** I proposed, co-planned, and served on a panel about applying to graduate school for members of the Psi Upsilon international fraternity. I suggested the topic and questions for the moderator to use during the discussion. The panel was hosted virtually on Zoom and was attended by ~30 members. (2021)

SERVICE (CONTINUED)

- **Department Graduate Student-Faculty Liaison:** I attend all department faculty meetings to provide faculty with a graduate student perspective as well as raise any concerns the graduate student body wants to share with faculty. I document key discussions in faculty meetings that relate to graduate education and share a summary with the entire graduate student body to keep them informed. In faculty meetings I have advocated for the extension of non-resident tuition waivers for international students delayed by COVID-19, more career programming for paths outside of academia, and improved financial and programming support for masters degree students. (2020-2021)
- **Department Anti-Racism Task Force on Graduate Education:** I was selected as one of four students to serve on this task force. The primary purpose of this group is to address issues of systemic racism raised by Black students in our department. By the end of Winter 2021, we will complete a white paper on concrete actions to address the specific concerns raised. (2020-2021)
- **Científico Latino Fellowship Application Mentor:** I provided detailed feedback on NSF GRFP fellowship applications for two students from underrepresented backgrounds. One mentee was a post-baccalaureate student while the other was a current PhD student. (2020)
- **UCLA Equity, Diversity, and Inclusion Orientation:** During the 2019 graduate student orientation, I served as a panelist on the topic of Womxn in STEM. The panel was attended by ~45 students. In 2020, I served on a virtual panel about graduate student experiences as an LGBTQ+ person of color. This panel was attended by ~25 students. (2019, 2020)
- **Psi Upsilon Alumni Weekend Career Panel:** I participated in a panel focused on potential careers after graduate school. The goal of our discussion was to provide undergraduates with a perspective on the realities of graduate school and aid in deciding if students want to pursue graduate school. It was attended by three undergraduates in the Duke chapter of the Psi Upsilon fraternity. The panel was conducted over Zoom and recorded for students unable to attend. (2020)
- **SACNAS Graduate Student Panel:** I served as a panelist in a program focused on life as a graduate student. The program was aimed at providing undergraduates with student perspectives to aid in their decision-making process of whether or not to apply to graduate school. The panel was attended by ~30 students. (2020)
- **UCLA Ecology and Evolutionary Biology Graduate Student Orientation:** I created and gave a presentation on how to access mental health care through university Counseling and Psychological Services and seeking treatment off campus with UCLA student health insurance. (2019, 2020)
- **Homeless LGBTQ+ Youth Brunch:** Twice I participated in three hours of food preparation for a free brunch at the Hollywood LGBT center for ~30 homeless LGBTQ+ youth. (2019)
- **UCLA Historically Black Colleges and University (HBCU) Initiatives:** I worked one-on-one for an hour with an undergraduate student from an HBCU conducting research at UCLA for the summer. I edited and provide suggestions for an abstract about the student's research. Additionally, I assisted the student in designing a poster for a research symposium. (2019)
- **SACNAS Lunch with Graduate Students:** I coordinated an event where three undergraduates and three graduate students were provided a lunch and given an intimate setting to have meaningful conversation. Attendees discussed experiences relating to graduate school, including unspoken rules of grad school culture, funding navigation, and resources for undocumented students. (2019)
- **Louis Stokes Alliances for Minority Participation (LSAMP):** I was a panelist for a program hosted at UCLA for undergraduate student members of LSAMP who are interested in pursuing a graduate degree in biology. (2018, 2019)

SERVICE (CONTINUED)

- **Duke Admissions Office:** I was an alumni interviewer, in which I met with prospective Duke Undergraduates and provided the admissions office with written evaluations. (2013 – 2019)
- **SACNAS Mentor Match:** I instituted a program to match undergraduates with a graduate student mentor to get feedback on graduate school applications. A total of seven undergraduates participated and more than 20 graduate students were recruited as potential mentors. (2018)
- **Explore Your Universe Science Festival:** I led a module that taught students of all ages about density through the creation of water bottle lava lamps, which students were able to keep. Over 200 students participated in this module. (2018)
- **SACNAS Early Academic Outreach Program Day:** I led a module on the physics of roller coasters. Students from local high schools completed the activity by constructing marble roller coasters (2018).
- **AWISE STEM Day:** I organized and ran a booth about DNA including a 10min DNA extraction from fruit. Attendees were approximately 200 female students from local middle schools. (2018)
- **ExploraVision:** I was a mentor for a team of four local high school students entering the Toshiba ExploraVision competition. I advised students on limitations and possible future improvements in CRISPR/Cas9 technologies. (2018)
- **Engineer in Training Day:** I was a facilitator for a module on the neuroscience of optical illusions for students interested in STEM careers from four local high schools. (2017)
- **Duke Lemur Center:** I was a tour guide for the world's largest lemur collection, providing visitors from around the world with an educational introduction to prosimian primates and the center's research and conservation efforts. I gave one tour (2 hours) per week. (2014 – 2017)