

JOSÉ M. DEL RÍO PANTOJA
Harvard Chemical Biology PhD Candidate
Email: jdelriopantoja@g.harvard.edu
Website: www.delriopantoja.com

EDUCATION

Harvard University <i>Ph.D. Chemical Biology</i>	2018 – Present
Pennsylvania State University <i>B.S. Biochemistry and Molecular Biology</i>	2014 – 2018

RESEARCH & PROFESSIONAL APPOINTMENTS

Mostoslavsky Laboratory, Massachusetts General Hospital <i>Graduate Research Assistant</i>	Jan 2022-Present
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- Areas of investigation: assay development, cancer biology, chromatin biology, post-translational modifications, proteomics, biochemistry, cell biology, bioinformatics, DNA repair, and metabolism
- Project: I am interested in developing technology to identify proteins from human sample that have additional amino acids than encoded at their DNA sequence. I am also studying the functional role of this unique post-translational modification, especially when protein have extra glutamic acids, and establishing their disease relevance.

Kadoch Laboratory, Dana-Farber Cancer Institute <i>Rotation PhD Student</i>	Apr 2019 – Dec 2021
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- Areas of investigation: chromatin biology, genomics, biochemistry, and cancer biology.
- Projects: I studied the genome-wide impact of small molecule-mediated inhibition of the mSWI/SNF chromatin remodeler. I also explored the role of actin-like proteins in chromatin remodeling by leveraging cancer- and intellectual disability-associated point mutations.

Karmacharya & Haggarty Laboratories, Massachusetts General Hospital <i>Rotation PhD Student</i>	Sep 2018 – Apr 2019
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- Areas of investigation: neurobiology, stem cell biology, neuropsychiatric disorders, organoids, bioinformatics, chromatin, immunofluorescence.
- Projects: I studied the role of activity-regulated cytoskeleton-associated protein in neuropsychiatric disorder models.

Koide Laboratory, NYU Langone Health <i>Summer Research Assistant</i>	Jun 2017 – Aug 2017
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- Areas of investigation: protein engineering, protein-protein interactions, structural biology, and molecular cloning.
- Project: I located the binding interface between a synthetic antibody and protein implicated in the maintenance of tumor microenvironment in pancreatic cancer.

Boal Laboratory, Pennsylvania State University <i>Undergraduate Research Assistant</i>	Jan 2016 – May 2018
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- Areas of investigation: molecular biology, crystallography, protein purification, organic chemistry, kinetic studies, and structural biology
- Projects: I studied the arrow-pushing mechanism of two enzymes, FtmOx1 & VioC, by crystalizing them with substrate analogues and exploring the kinetics of their WT and mutant forms.

HONORS & AWARDS

Bok Award for Excellence in Graduate Student Teaching of Harvard Undergraduates	2025
Certificate of Distinction in Teaching of Undergraduates in Harvard College	2022-2025
Epigenomes Journal Conference Fellowship	2023
Ruth L. Kirschstein National Research Service Award (F31 Individual NRSA) Award Recipient	2021
Ford Foundation Fellowship Honorable Mention	2020
National Science Foundation Graduate Research Fellowship Program Honorable Mention	2020
Harvard Graduate School of Arts and Sciences Prize Fellowship	2018

Riegel Family Trustee Scholarship	2017
Student Leader Scholarship	2016 & 2017
Edmund J. Elder Trustee Scholarship	2015 & 2016
First Place Winner of Policy Speech Class Competition	2016
First Place Winner of Engineering Design Class Competition	2015

SCHOLARLY PRODUCTIVITY

Publications

- **Del Rio Pantoja JM**, Mostoslavsky R (2025). Post-translational incorporation of amino acids to proteins and its therapeutic opportunities in human disease. *Molecular Cell*. Invited Review – In Preparation
- Clarke TL, Cho HM, Ceppi I, Gao B, Yadav T, Silveira GG, Boon R, Martinez-Pastor B, Amoh NYA, Machin B, Bernasocchi T, Ashfaq D, Mendez J, Kamaliyan Z, **Del Rio Pantoja J**, Sardi Rogines G, Crowley BT, McGinn DE, Giunta V, Tran O, Zackai EH, Lan L, Zou L, Emanuel BS, McDonald-McGinn DM, Cejka P, & Mostoslavsky R. (2025). ZNF280A links DNA double-strand break repair to human 22q11.2 distal deletion syndrome. *Nature Cell Biology*. 27(6):1006-1020.
- Dunham NP, **Del Rio Pantoja JM**, Zhang B, Rajakovich LJ, Allen BD, Krebs C, Boal AK, & Bollinger JM Jr. (2019). Hydrogen Donation but not Abstraction by a Tyrosine (Y68) during Endoperoxide Installation by Verruculogen Synthase (FtmOx1). *Journal of the American Chemical Society*. 57(46):6479-6488.
- Dunham NP, Mitchell AJ, **Del Rio Pantoja JM**, Krebs C, Bollinger JM Jr, & Boal AK. (2018). α -Amine Desaturation of d-Arginine by the Iron(II)- and 2-(Oxo)glutarate-Dependent L-Arginine 3-Hydroxylase, VioC. *Biochemistry*. 141(25):9964-9979.

Undergraduate Thesis

- **Del Río Pantoja JM**, Dunham NP, Boal AK (2018). Structural and Mechanistic Studies of Endoperoxide Formation by the Non-heme Fe(II) and 2-oxo-glutarate-dependent Dioxygenase FtmOx1.

Invited Talks, Lectures, and Presentations

Wow That's Very Fascinating! Biochemistry and Proteomics	August 2025
<u>Location</u> : Simches Research Center, Mass General Cancer Center	
<u>Relevance</u> : I was the only graduate student scholar invited to introduce the department to the basics of proteomics and the protocols available in the department.	
When Proteins Have Additional Amino Acids: Detecting Glutamylolation in Human Malignancy	January 2025
<u>Location</u> : MGH at Navy Yard, Mass General Cancer Center	
<u>Relevance</u> : Cancer department-wide presentation about my findings related to my primary research work.	
An Integrated Introduction to the Life Sciences: Genetics, Genomics & Evolution Lecture	March 2023-2025
<u>Location</u> : Science Center, Harvard University	
<u>Relevance</u> : I facilitated an entire lecture on Microbiome, Linkage, Epigenetics & Cancer for 200+ students.	
An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology & Cell Biology Lecture	August 2023-2025
<u>Location</u> : Harvard Science Center, Harvard University	
<u>Relevance</u> : I facilitated an entire lecture on drug discovery for 100+ students.	
Uncovering novel metabolo-epigenetic mechanisms in mammalian hibernation and human malignancy	2022
<u>Location</u> : Simches Research Center, Mass General Hospital	
<u>Relevance</u> : Center for Regenerative Medicine Department-wide presentation	

Posters

- Dynamic histone modifications link robust metabolic shifts during mammalian torpor. 2023
Conference: Epigenetics Society (ES) International Meeting: Epigenetics of Disease and Development
Location: Rome, Italy
- Mapping Structural Landscape of Galectin-9 to Determine Antibody Binding Sites. 2017
Conference: Leadership Alliance National Symposium
Location: Hartford, Connecticut

TEACHING & MENTORING EXPERIENCES

Undergraduate Mentees Supervised

Aug 2022-Present

- Taught a Harvard undergrad on his first wet-laboratory experience and established him with the protocol and lab space
- Supervised his own, independent research project regarding post-translational amino acid addition in cancer
- Wrote warrants with my mentee, which awarded him the Yun Fellowship and the Herchel Smith Harvard Fellowship (he became one of the few freshmen to have ever been awarded with this fellowship)

Teaching Assistant

Aug-Dec 2021-Present

Course: Introduction to Chemistry, Molecular Biology, and Cell Biology (LS1A)

Institution: Harvard College, Cambridge, MA

- Designed and led undergraduate discussion sections, reviewing weekly topics and problem sets
- Served as a lab teaching fellow, guiding students through weekly laboratory experiments
- Offered feedback to students in the form of verbal corrections and grading formal assessments.

Teaching Fellow

Jun-Aug 2022-2025

Course: Organic Chemistry Laboratory (CHEMS17 & CHEMS20)

Institution: Harvard College, Cambridge, MA

- Supervised college-level Organic Chemistry 1 students throughout their laboratories, which covered techniques ranging from distillation, extractions, and column chromatography to organic synthesis.
- Facilitated discussions on organic chemistry concepts
- Offered feedback to students in the form of verbal corrections and grading formal assessments.

Teaching Fellow

Jan-May 2022-2025

Course: Introduction Genetics, Genomics, and Evolution (LS1B)

Institution: Harvard College, Cambridge, MA

- Designed and led undergraduate discussion sections, reviewing weekly topics and problem sets
- Served as a lab teaching fellow, guiding students through weekly laboratory experiments
- Offered feedback to students in the form of verbal corrections and grading formal assessments.

Head Teaching Assistant

Jan-May 2023-2024

Course: Life Sciences 1b Genetics, Genomics & Evolution (LS1B)

Institution: Harvard College, Cambridge, MA

- Supported the development of course material and other administrative tasks
- Wrote exam and problem set questions
- Facilitated and lead sessions for other teaching fellows to improve their facilitation skills

Head Teaching Assistant

Jun-Aug 2024

Course: Organic Chemistry Laboratory (CHEMS17 and CHEMS20)

Institution: Harvard College, Cambridge, MA

- Oversaw the entire lab component of the summer organic chemistry course
- Supported the development of course material and other administrative tasks
- Managed difficult situations where students weren't following lab safety rules

Head Teaching Assistant

Aug-Dec 2022-2023

Course: Introduction to Chemistry, Molecular Biology, and Cell Biology (LS1A)

Institution: Harvard College, Cambridge, MA

- Supported the development of course material (exams and problem sets) and other administrative tasks
- Designed and led review sections for the students in the course that were performing below the mean performance in the 200+-student course

Teaching Fellow

Jan 2022-May 2022

Course: Organic Chemistry of Life (CHEM27)

Institution: Harvard College, Cambridge, MA

- Designed and facilitated practice problem-based discussion sections that went over the topics covered in lecture each week
- Assisted students and offered feedback on their learning progress through one-on-one meetings, office hours, problem set and exam grading, and after-section exchanges

Teacher/Mentor

Jan 2020

Course: Wintersession Biochemistry Bootcamp**Institution:** Wellesley College, Wellesley, MA

- Mentored and guided underrepresented minority freshmen students through a weeklong bootcamp about protein purification, teaching them techniques such as cloning, SDS-PAGE, and column chromatography
- Facilitated a lecture on protein folding, sources, and purification

Guided Study Group Leader

Jan 2017 – May 2018

Course: Organic Chemistry**Institution:** Penn State Learning, Pennsylvania State University, University Park, PA

- Lead 1.5hr review sessions twice a week for an average of 80 students per session
- Organized and taught exam reviews, which often filled rooms with 150-200 students

Learning Assistant

Aug 2016 – Dec 2016

Course: Biochemistry & Molecular Biology Seminar**Institution:** Pennsylvania State University, University Park, PA

- Guided a group of Biochemistry and Molecular Biology, Biotechnology, and Microbiology freshmen
- Instructed and facilitated discussions on basic science concepts during lecture

Learning Assistant.

Aug 2016 – Dec 2016

Course: Organic Chemistry 1**Institution:** Pennsylvania State University, University Park, PA

- Independently ran two 55-minutes long review sessions per week for an average of 35 students per session.
- Lead workshops once a month, where the most challenging concepts discussed at the time were dissected

Learning Assistant

Aug 2015 – Dec 2015

Course: General Chemistry 1, University Park, PA**Institution:** Pennsylvania State University

- Facilitated in-class discussions in a lecture room with an average of 300 students
- Assisted students with problem sets during small group discussions

LEADERSHIP, SERVICE & OUTREACH**Ad Hoc Reviewer**

2023-Present

- Co-reviewed papers with my thesis advisor for the journals Cell, Aging Cell, Nature Cancer, EMBO, Nature Communications, Scientific Reports
- Wrote the draft of the review sent to the journals as part of the review process

Diversity and Inclusion Fellow, Graduate School of Arts and Sciences of Harvard University

Oct 2019 – Sept 2021

- Supported the efforts of the Office of Diversity and Minority Affairs (ODMA) within the Graduate School of Arts and Sciences (GSAS) at Harvard
- Developed and facilitated of two workshops on identity, culture, and community
- Supported student affinity groups serving historically underrepresented identities

The Health Professions Recruitment & Exposure Program, Harvard Medical School

Aug 2018 – Jan 2020

Co-Director of Diversity Leadership Team

Jun 2019 – Jan 2020

Mentor

Nov 2018 – Mar 2019

- Assisted high school students coming from disadvantaged backgrounds and interested in STEM professions with their professional development and college and scholarship application process
- Oversaw diversity and inclusion matters within the program
- Partnered with Harvard School of Education to facilitate training to volunteers on power dynamics, privilege and inclusive pedagogy

Alpha Epsilon Delta, Beta Chapter, Pennsylvania State University

Aug 2015 – May 2018

President

Apr 2017 – May 2018

Vice-President

Apr 2016 – Apr 2017

- Oversaw all events and programs organized by the club
- Created the honor society's website (www.aedpsu.com), Peer Mentoring Program, and Penn State's first student-run Physician Shadowing Program
- Coordinated the organizations' fundraising efforts for Penn State's student-run philanthropy, THON

TECHNICAL SKILLS & COMPUTATIONAL SKILLS

Laboratory Techniques: Assay development, genome editing of mammalian cells, 2D tissue culture, RNA and DNA (genomic and plasmid) extraction and library preparation for sequencing (RNA-seq, ATAC-seq, CUT&RUN, CUT&Tag, and ChIP-seq), protein quantification, immunoblotting, silver staining, coimmunoprecipitation (co-IP), chromatin immunoprecipitation (ChIP), RT-PCR, preparation of proteins for mass spectrometry (MS), bacterial and mammalian cell purification of proteins and protein complexes, chromatin remodeling complex nucleosome remodeling assays (restriction enzyme activity assay (REAA)) and ATPase activity determination, glycerol/sucrose based density sedimentation.

Laboratory Equipment: Liquid Chromatography-Mass Spectrometry, Microscopy (for cell culture, confocal immunofluorescence), NextSeq500 (for Next Gen Sequencing), ultrasonicator (for chromatin shearing, tissue homogenization), Automated electrophoresis for DNA/RNA qc (Tapestation, Bioanalyzer), fast-protein and high-performance liquid chromatography systems (FPLC and HPLC), thermal cycler for PCR, UV-Vis spectrophotometer, micropipettes.

Software: Thermo Fisher FreeStyle and Xcalibur, PyMol, Jupyter Notebook/Python, Geneious, Search Engine Comet, Gene Conservation Analysis, Microsoft Office Suite, Adobe Creative Suite.

Languages: Bilingual in Spanish and English, and elementary proficiency in French
