

Juan Manuel Vazquez

PhD Candidate at the University of Chicago, Department of Human Genetics

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EDUCATION

University of Chicago, Ph.D. Human Genetics Present

Laboratory of: Vincent J Lynch, Department of Human Genetics

Dissertation title: *The Role of Gene Duplicates in Resolving Peto's Paradox in Elephants and Bats*

Committee Members: Marcelo Nobrega, Joseph Thornton, Yang Li, Vincent J Lynch

University of Rochester, B.S. Biology, Molecular Genetics 2015

University of Rochester, B.A. Chemistry 2015

RESEARCH EXPERIENCE

Graduate Research Assistant, Vincent J Lynch, University of Chicago Fall 2016-Present

Studying Peto's Paradox and the duplication of tumor suppressor genes in large, long-lived species such as the African Elephant (*Loxodonta africana*), the Bowhead Whale (*Balaena mysticetus*), and the Little Brown Bat (*Myotis lucifugus*). The project involves searching for tumor suppressor homologues in other genomes using a custom Reciprocal Best-Hit BLAT pipeline I designed and programmed, followed by functional characterization of functional duplicates *in cellula*.

Mentored various undergraduate and graduate students rotating in the lab. As students all worked on subsets of my project, a major mentorship component was frequent informal journal clubs of papers related to our work. Additionally, students were all taught both basic skills like cell culture, and advanced skills like qPCR, Western blotting, and flow cytometry.

Rotation, Alex Ruthenberg, University of Chicago Summer 2016

Worked on transferring an Internally Calibrated ChIP (ICeChip) methodology to *C. elegans* to study H3K4me3 patterns at the onset of sexual maturity.

Research Assistant, Vera Gorbunova and Andrei Seluanov, University of Rochester January 2014 - May 2015

Analyzed the oxidative stress tolerance across various rodent species by culturing cells in high and low oxygen condition, using statistical analysis of growth rates to determine tolerance. Studied the effects of MEF SIRT6-KO cells in cancer cultures compared to wild-type MEF, and the role of the ADP-ribosylation function of SIRT6 in tumorigenesis. Created self-assembly hydrogels using hyaluronic acid derived from naked mole rat cells, and experimented with their use in maintaining 3D cell cultures, especially in the context of cancer and pluripotent stem cells. Studied the role played by RHAMM in the cancer resistance of the naked mole rat (*heterocephalus glaber*).

PUBLICATIONS

Journal Articles

Vazquez JM, Sulak M, Chigurupati S, Lynch VJ (2018). "A Zombie LIF, Gene in Elephants Is Upregulated by TP53 to Induce Apoptosis in, Response to DNA Damage." *Cell Reports*, 24(7), 1765-1776.

Patrick A, Seluanov M, Hwang C, Tam J, Khan T, Morgenstern A, Wiener L, **Vazquez JM**, Zafar H, Wen R, Muratkalyeva M, Doerig K, Zagorulya M, Cole L, Catalano S, Ladd A, Coppi A, Coşkun Y, Tian, X, Ablueva J, Nevo E, Gladyshev V, Zhang Z, Vijg J, Seluanov A, Gorbunova V (2016). "Sensitivity of primary fibroblasts in culture, to atmospheric oxygen does not correlate with species lifespan.", *Aging*, 8 (5), 841-847.

TEACHING EXPERIENCE

Teaching Assistant, BIOS 20235 Biological Systems, University of Chicago Winter 2019

The second part of the introductory Biology course series for advanced students, focusing on developmental, ecology, and evolutionary biology. In addition to grading and organizing the course, TAs guided discussion sections for students to discuss weekly papers in a collaborative setting.

8th Grade Teacher, Ideal Student Workshop and Test Prep, Swift Elementary School 02-05/2019

Taught a weekly 1-hour class on executive life skills, study skills, and practice for taking standardized tests such as the NWEA-MAP exam. Classes were a combination of experiential, game-based learning; group work; and interactive lectures.

Teaching Assistant, BIOS 21306 Human Genetics and Evolution, University of Chicago Winter 2017

Undergraduate course focusing on historic and modern advances in our understanding of human genetics at various scales. In addition to keeping attendance and organizing the course, he taught a lesson on classic and modern techniques for sequencing DNA & RNA; detecting epigenetic modifications in the genome; and on detecting signatures of selection in the genome.

Tutor, Educational Endeavors 2015-Present

Over 450 hours spent teaching and tutoring students at the high school and undergraduate level. Tutored in all subjects ranging from STEM fields (Biology, Physical Sciences, Math, Forensics), to language arts (English, Spanish, French) and social sciences (History, Economics) at regular, AP, and collegiate levels. Additionally, helped run and participated in various tutoring workshops with students from the Daniel Murphy Scholarship Fund and LINK Unlimited.

Teaching Assistant, BIOS 21306 Human Genetics and Evolution, University of Chicago Winter 2017

Undergraduate course focusing on historic and modern advances in our understanding of human genetics at various scales. In addition to keeping attendance and organizing the course, he taught a lesson on classic and modern techniques for sequencing DNA & RNA; detecting epigenetic modifications in the genome; and on detecting signatures of selection in the genome.

Teaching Assistant, CHM 210H Honors Organic Chemistry Lab, University of Rochester Spring 2013

Assisted in the instruction of the lab lecture, lead workshop-style discussions to create the experimental procedures for the labs with students. Oversaw and administered the proper functioning of the lab. Aided and taught students, as well as assessed them for quality work and analytic skills in lab work and in lab reports.

Teaching Assistant, CHM 173Q Freshman Organic Chemistry Lab, University of Rochester Fall 2012

Oversaw an organic chemistry lab of 16 freshmen students, grading reports and ensuring the proper functioning of the lab. Ran weekly workshops and lectures for students to design their experiments for the week.

PUBLIC MEDIA

Guest on Science Friday: Flatow, Ira. "How A 'Zombie Gene' Helped Elephants Evolve Protection From Cancer." Audio blog post. Science Friday. NPR, 08/17/2018. <https://www.sciencefriday.com/segments/how-a-zombie-gene-helped-elephants-evolve-protection-from-cancer/>.

FUNDING

2019 *Diversity and Inclusion Small Projects Grant*, University of Chicago. The Biological Sciences Division of the University of Chicago offers \$2000 grants for competitive proposals that will enhance diversity and inclusion in the Division.

2018 *Diversity and Inclusion Pilot Program Grant*, University of Chicago. The Office of Diversity and Inclusion at the University of Chicago provides opportunities for members of the university to submit proposals for projects of various scales. The Pilot Program scale provides \$5000 for a large-scale project that will promote the goals of the Office of Diversity and Inclusion on campus.

2018-2019 *Yale Ciencia Academy Fellowship*. The YCA Fellowship provides outstanding students in the Biological Sciences with professional development and scientific outreach training in a year-long program. The program requires the completion of a scientific outreach program that is designed by the Fellow, and executed in groups throughout the year.

2011-2015 *Dean's Scholarship*, University of Rochester. Winners of Dean's Scholarships have demonstrated both academic achievement and the potential to make unique contributions to Rochester student life. The Dean's Scholarship is a reward for students' hard work in high school and a statement of our trust in their continued success here on campus.

2012-2014 *Howard Bryant Memorial Scholarship*, University of Rochester. The Fund was established in 2004 to honor Howard's legacy of caring and support by providing aid to students interested in pursuing a career in Sciences or Engineering. Two students are picked to receive the scholarship each year, beginning in their sophomore year for two years.

AWARDS

2018 *SACNAS Chapter Award for Professional Development*. Awarded by the Society for the Advancement of Chicanos and Native Americans in Science in recognition of the UChicago SACNAS Chapter's exceptional work in organizing and executing the first-ever Midwest Regional SACNAS Conference.

SCHOLARLY AND PROFESSIONAL AFFILIATIONS

Corresponding Chair, *Gordon Research Seminar on the Biology of Aging* 2017-2019

Along with Co-Chair Victor Bustos, working to organize and fundraise for the 2019 GRS on the Biology of Aging. Responsibilities include securing keynote speakers and funding for the conference, curating abstracts for speakers and abstracts, and general planning of various details of the conference.

President, *Society for the Advancement of Chicanos and Native Americans in Science, University of Chicago*
2018-Present

Organized various monthly professional development workshops catering to undergraduates, graduates, and post-docs. Coordinated outreach between Chicago-area SACNAS Chapters. Leading the team of organizers for the 2019 Midwest Regional SACNAS Conference in Chicago.

Treasurer, *Society for the Advancement of Chicanos and Native Americans in Science, University of Chicago*
2017-2018

Helped run various workshops catering to a primarily undergraduate audience. Helped raise over \$16,000 in funds for the first-ever Midwest Regional SACNAS Conference. As part of a team, helped organize and execute the first-ever Midwest Regional SACNAS Conference in Chicago.

Student Representative for Human Genetics, *University of Chicago* 2017-2018

Planned and ran various events for Human Genetics students. Assisted with recruitment activities and planning. Assisted with the planning and running of the Molecular Biosciences Retreat.

PROFESSIONAL ACTIVITIES

Committee Member, Biological Sciences Division Diversity & Inclusion Representative Selection Committee 2017-2018

Part of a 4-person committee tasked with designing the procedures for selecting a student representative for the nascent Diversity and Inclusion Committee.

Panelist, "How to Succeed in Grad School", Summer Graduate Research Program, University of Chicago August 2018

Panel focused on the experiences of panelists as underrepresented minorities in STEM, and how they navigated life through their PhDs. Panelists shared their advice and stories about how they overcame various obstacles in academia.

OUTREACH ACTIVITIES

Invited student, Discover UChicago, University of Chicago October 2018

The *Discover UChicago* program provides undergraduates with an opportunity to come to the University for a week and learn about campus life and research. At the program's conclusion, current students come to give attendees general advice about professional skills, applying to graduate programs, and selecting mentors and programs.

Volunteer, Science Works, Museum of Science and Industry Fall 2016-2018

Science Works is an event hosted by the Museum of Science and Industry of Chicago that showcases real-life scientists and science to the general public. Alongside other Human Genetics personnel, the team organized and participated in a variety of scientific demonstrations.

Volunteer, Stand Up for Science, Field Museum Spring 2018

Organized and participated in various demonstrations, and generally spoke about science to members of the general public at the Field Museum.

CERTIFICATES AND MINI-COURSES

Successfully Managing Your Team of Scientists, University of Chicago myCHOICE program Summer 2018

16-hour workshop introducing concepts in team management in industry and academia. Attendees were able to apply knowledge from each session in practical exercises under various scenarios.

Introduction to Effective Teaching in STEM, University of Chicago myCHOICE program Spring 2018

Attendees honed their teaching skills through lectures and practical exercises in this evidence-based pedagogy course.

Beyond the Bench: The Business of Running a Lab, University of Chicago myCHOICE program Fall 2017

A rotating panel of primary investigators and heads of facilities at the University of Chicago taught students every week about the behind-the-scenes work that went into starting and running their labs.

ADDITIONAL SKILLS

- Fluent in English, Spanish, and French
- Proficient in Python, R, and Unix environments
- Experienced with Flow Cytometry, Confocal Microscopy, RNA-seq, ICeChIP, and various other cutting-edge techniques in molecular and cell biology.