Miles Valencia

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EDUCATION

University of California, Irvine (UCI) **Planned June 2027**
Doctor of Philosophy in Biology
California State University, San Bernardino (CSUSB) **July 2022**
Master of Science in Biology
Thesis: "*Early-Exercise Effects on Mice Tendon Remodeling*"
California State University, Long Beach (CSULB) **May 2018**
Bachelor of Science in Biology Education
East Los Angeles College (ELAC) **May 2015**
Associate of Arts: Natural Sciences, and Social & Behavioral Sciences - *Honors Program Certified*

RESEARCH EXPERIENCE

Dr. Manny Azizi, UCI – muscle physiology & biomechanics lab **Aug. 2022 – Present**
Graduate Researcher

- Experimentally altered tendon materials properties using genipin to systematically characterize properties of in-series muscles
- Investigating the regional variation in tendon materials properties and how this might affect the mechanical relationship between skeletal muscles and in-series tendons
- Lead a team of undergraduate researchers investigating the effects of functional control on tendon mechanical properties by comparing the tail tendons of kangaroo rats and lab rats
- Designed a custom rig equipped with an ergometer to conduct materials testing on tendon fascicles while submerged in Ringer's solution and a high-speed video camera to capture 2 orientations simultaneously

Dr. Angela Horner, CSUSB – functional morphology & biomechanics lab **July 2019 – July 2022**
Graduate Researcher

- Investigated the effects of maturation and exercise on mice tendon remodeling using a mice colony artificially selected for high-voluntary wheel running behavior called High-Runners
- Conducted a pilot study to assess the effects of different training protocols on mice tendon materials properties
- Drafted custom code in RStudio for importing, wrangling, and plotting exploratory graphs concerning mice wheel training
- Housed 2 cohorts of 60 mice consisting of normal and High-Runner linetypes, and recorded the wheel activity of 20 mice simultaneously
- Measured mice tendon morphometrics using an image processing software (ImageJ, NIH), measured forces using an ergometer and physiological data analysis software (ADInstruments LabChart), recorded high-speed videos of materials testing on tendon to visually track mechanical strain (ProCapture, XCitex), and finally, conducted data analysis using IGOR Pro
- Performed analyses using the statistical program JMP and produced data visualization using custom code in RStudio
- Collaborated with computer science researchers to design a 3D printable jump platform to quantify jump frequencies of mice in separate cages using infrared sensors and a raspberry Pi
- Wrote, revised, and completed a master's thesis titled: "Early-Exercise Effects on Mice Tendon Remodeling"

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Dr. Sandy Kawano, CSULB – Fins and Limbs Lab
Hispanic Opportunities for Graduate Access and Retention (HOGAR) Program **Mar. 2019 – July 2019**
Post-Baccalaureate Researcher

- Improved the protocols of 2 teaching labs for Comparative Animal Physiology
- Applied an array of water temperatures to marine ectotherms to show the cardiovascular responses of animals with different physiologies
- Developed a teaching lab investigating the effects of neurotransmitters on the cardiovascular system utilizing the transparent carapace of Ghost Shrimp and affordable digital microscopes
- Conducted a literature review on the physiologies of marine ectotherms and incorporated relevant studies into the teaching lab protocols
- Collaborated with team to improve the lab activity's readability for students
- Identified the Student Learning Outcomes, and verified that the lab activity achieved them
- Coauthored a teaching article about ectotherm physiology

Volunteer Researcher **June 2018 – Mar. 2019**

- Investigated the locomotor strategies of Spanish ribbed newts that primarily live in semi-aquatic conditions, so we may compare the differences in 3D kinematics with studies on terrestrial salamanders and better understand the water-to-land transition in vertebrate evolution
- Tracked 6 landmarks on the forelimb and pectoral girdle using XMALab and calculated joint angles, duty factor, and speed using custom code in RStudio
- Performed linear mixed model effects using RStudio to calculate statistical differences between the kinematic variables of the semi-aquatic and terrestrial salamanders

Undergraduate Research Assistant **Sep. 2017 – May 2018**

- Investigated the locomotor strategies utilized by African mudskippers for different environmental features, which then informed models for the water-to-land transition in vertebrate evolution
- Tracked 3-4 landmarks on amphibious fish using the DLTdv5 GUI in MATLAB; these landmarks were converted into 3D kinematics where we determined displacement, bending of the body, and the degree of fin protraction and retraction
- Coordinated animal husbandry and assisted with live animal care for the Dr. Kawano's research and teaching labs
- Conducted mock peer reviews of manuscripts with 3 lab members

Dr. Ted Stankowich, CSULB – Mammal Lab **June 2018 – Aug. 2018**
Volunteer Researcher

- Dissected cranial muscles from coyotes to measure the differences in biting forces of rural and urban coyotes by estimating the bite muscles of the jaws through anatomical dissections

PUBLICATIONS

1. **Valencia M**, Yamauchi E[U], McGowan C, Azizi M, "Tale of two tails: material properties of kangaroo rat (*Dipodomys deserti*) and lab rat (*Rattus sp.* BNx344) tail tendon fascicles" (2025*). *In prep**.
2. **Valencia M**, Monroy J, Garland T, Horner A, "Exercise effects on tendon in mice selectively bred for high running" (2024*). *In prep**.
3. **Valencia M**, "Early-Exercise Effects on Mice Tendon Remodeling" (**2022**). *Electronic Theses, Projects, and Dissertations*. 1554. https://scholarworks.lib.csusb.edu/etd/1554

[U] = Undergraduate coauthor

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TEACHING EXPERIENCE

UCI School of Biological Sciences **Sep. 2022 – Present**
Graduate Teaching Assistant
BIO SCI 100 – *Scientific Writing* (1 quarter)
- Guided discussions with students to better comprehend research hypotheses and figures

BIO SCI D170 – *Applied Human Anatomy* (4 quarter)
- Facilitated active learning strategies like jigsaw groupwork

BIO SCI E112L – *Physiology Lab* (1 quarter)
- Facilitated experiments that used BIOPAC data acquisition systems to explain physiological concepts

CSUSB College of Natural Sciences **Sep. 2019 – July 2022**
Graduate Teaching Assistant
BIOL 100 Lab – *Topics in Biology* (1 quarter)
- Tailored lectures about the scientific method and core biology concepts to the interests and applications for non-biology major undergraduates
- Guided classrooms of 24 students through exercises such as microscope slide preparation

BIOL 201 Lab – *Biology of Organisms* (1 quarter)
- Designed lectures about organismal diversity that promoted a class culture of student engagement
- Taught proper microscopy techniques including gram stains to classrooms of 24 students

BIOL 224 Lab – *Human Anatomy and Physiology II* (1 quarter)
- Produced and edited online lectures using Zoom and Camtasia
- Taught students about different organ systems (i.e. the peripheral circulatory system)

BIOL 2230 & 2240 Lab – *Human Anatomy and Physiology I & II* (4 semesters)
- Developed lectures incorporating physical and virtual models for teaching Anatomy and Physiology through a virtual classroom (i.e. AnatomyStandard.com)
- Replicated an in-person experience for students by integrating group work using tools such as zoom breakout rooms, BlackBoard discussion boards, and Google JamBoards.
- Demonstrated cat dissections while explaining musculoskeletal elements

CSULB College of Natural Sciences **Jan. 2018 – May 2018**
Laboratory Instructor's Aide
BIOL 213 Lab – *Biology: Introduction to Ecology & Physiology* (1 semester)
- Corrected and provided feedback for quizzes
- Presented two lectures on ecology and the cardiovascular system to sophomore and juniors
- Assisted and demonstrated techniques in laboratory exercises and dissections

PROFESSIONAL EXPERIENCE

Coyote Research Ambassador **Aug. 2020 – May 2021**
Office of Student Research, CSUSB
- Informed undergraduate classes about college resources that help make research accessible
- Peer mentored undergraduates to help achieve their research goals (i.e. construct a research poster)
- Co-/Hosted virtual workshops to 60+ audience members about research topics such as getting involved with research, and grant proposal writing
- Developed a workshop for preparing graduate students to be successful in their graduate programs
- Hosted faculty interviews on Instagram to increase outreach to the student population
- Participated in a search committee for a new director for the Office of Student Research

Biology and Mathematics Tutor **Oct. 2018 – Oct. 2019**
Varsity Tutors, Online Platform
- Networked with parents to gain biology and mathematics students
- Organized appointments considering tutoring locations as well as students' time restraints
- Built a strong rapport with students and parents by showing my mastery of subjects and altering my tutoring style according to the students' needs

Tutor Manager **Oct. 2016 – May 2019**
Athletic Boosters, Christian Valley High School
- Tutored 9th through 12th grade student athletes, - predominantly from African American and Latino communities
- Organized the tutoring schedule for students, parents, and tutors
- Reinforced concepts taught in class from Algebra I to Trigonometry by modeling problem-solving techniques and helping students practice with examples
- Explained scientific concepts for classes such as Biology and Physiology

English and Writing Tutor **Jan. 2014 – Jan. 2017**
Writing Center, ELAC
- Assessed the learning performance of students and then modified the curriculum accordingly to improve their educational experiences
- Guided students with their ideas to correctly answer their prompts and fostered their confidence to attempt independent progress with their writing
- Taught grammar and writing workshops to classes up to 15 students
- Assessed co-tutors' skills and provided constructive feedback to improve tutoring capabilities

MENTORING & OUTREACH

Near-Peer Mentor, UCI **July – Sep. 2024**
Integrative Movement Sciences Institute
- Mentored 4 undergraduate researchers involved with 3 independent projects
- Trained mentees on materials testing protocols including field-specific programs and equipment

Professional Development Chair, UCI **Aug. 2023 – Present**
UCI Chapter of SACNAS
- Coordinated MENTORÍA, a mentoring program designed to cultivate a sense of community among underrepresented students and empower students to reach their goals
- Connected with resource centers on campus to organize joint workshops addressing the needs of both our demographics; workshops include: Getting Involved with Research, Student Organization Panel, Applying to Graduate School, SURP Proposal Workshop, and more.

Graduate Panel on *Origin Stories*, CSUSB **Nov. 2023**
Best Student Poster Presentation Judge, SWOB **Nov. 2023**
Graduate Research Mentor, UCI **Sep. – Dec. 2023**
Transfer-to-Teaching NOYCE Scholarship Program
- Demystified research for future educators by highlighting current research in the lab
- Guiding mentees through data collection and analysis for materials testing research

Science Writing Integrated Mentoring (SWIM) Program **Sept. 2022 – Dec. 2022**
Ecology and Evolutionary Biology Department, UCI
- Guided 5 students from generating research ideas to finalizing their individual research proposals
- Revised and provided comments to improve students' research proposal drafts

Panel Discussion on *Students Accepted into Graduate Programs*, CSUSB **Apr. 2021**

- Discussed the difficulties of applying to graduate programs, and shared the lessons learned throughout my master's program and going into my PhD program

AFSA's Education Committee **Jan. 2021 – Jan. 2023**

- Collaborated with committee in organizing and coordinating projects that increase awareness of Filipino science (i.e. Kumustahans, podcasts and Youtube series highlighting Filipino researchers)

AFSA Mentorship Program, Online **Oct. 2020 – Jan. 2023**

- Shared about our Filipino identities as well as career & personal goals
- Identified application requirements for fellowships and graduate schools in the Philippines
- Coordinated 2nd-to-present iterations of program by collaborating with team about mentor-mentee pairs and organizing guest speakers for skill-building workshops

National Biomechanics Day at CSULB **Apr. 2019**

- Coordinated with the movement science and robotics labs to introduce students to biomechanics
- Engaged students in a biomechanics activity on lever systems using vertebrate skeletons
- Emphasized the overlapping areas of biorobotics, human and animal biomechanics

Jordan High School visit at CSULB **Nov. 2018**

- Presented ongoing research projects in Dr. Sandy Kawano's lab to high school seniors
- Engaged students in a biomechanics activity on lever systems using vertebrate skeletons
- Informed groups about applications of biomechanics research to the medical field

GRANTS, AWARDS, AND FELLOWSHIPS

Integrative Movement Sciences-Summer Research Institute (**$500**)	**Sep. 2024**
UCI Ecology and Evolutionary Biology Travel Award (**$500**)	**July 2024**
GAANN Research Funds (**$3000**)	**June 2024**
GAANN Fellowship (**$8631**)	**June 2024**
UCI Associated Graduate Students Travel Award (**$250**)	**Aug. 2023**
UCI DTEI Graduate Scholars Program (**$5000**)	**June 2023**
UCI Ecology and Evolutionary Biology Travel Award (**$500**)	**May 2023**
UCI EEB Department nomination for Faculty Mentor Fellowship	**Mar. 2023, 2024**
UCI Ecology and Evolutionary Biology: SWIM Mentorship (**$500**)	**Dec. 2022**
CSUSB College of Natural Sciences: Outstanding Graduate Student Award	**May 2022**
CSUSB Office of Student Research: Student Travel Award (**$819.90**)	**Jan. 2022**
SICB Broadening Participation Travel Award (**$300**)	**Jan. 2022**
Integrative Movement Sciences-Summer Research Institute (**$2000**)	**Jul. 2021**
Outstanding Graduate Student Researcher (**$500**)	**Apr. 2021**
Office of Student Research: Research Supplies Grant (**$1000**)	**Mar. 2020**
SICB Charlotte Mangum Travel Award (**$75** x2)	**Jan. 2019, 2020**
SICB Broadening Participation Travel Award (**$500** x2)	**Jan. 2019, 2020**

Cumulative funds – $24,650.90

funds awarded to undergraduate students whom I provided application revisions

UCI UROP Summer Undergraduate Research Program (**$1500** x2)	**June 2024**
UCI UROP Travel Award (**$1000**)	**Dec. 2023**
UCI UROP Research Experience Fellowship (**$1000**)	**Dec. 2023**
UCI UROP Summer Undergraduate Research Program (**$1500** x2)	**June 2023**
CSUSB Undergraduate Summer Research Program (**$2800** x3)	**June 2021**

Cumulative funds – $13,600

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PROFESSIONAL AFFILIATIONS

Society for the Advancement of Biology Education Research (SABER) **Jan. 2024 – Present**
Attended SABER West Conference in January 2024
American Physiological Society (APS) **Dec. 2022 – Present**
Attended National American Physiology Summit Conference in April 2023
Society of Integrative and Comparative Biology (SICB) **Nov. 2017 – Present**
Attended National SICB Conference in January 2018-2020, 2022-2024
Attended Southwest Regional Meetings of Organismal Biologists (SWOB) in November 2018, 2023
Association of Filipino Scientists in America (AFSA) **Oct. 2020 – Present**
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) **Aug. 2021 – Present**

INVITED TALKS AND GUEST LECTURES

Guest Lectures
UCI D170 – Applied Human Anatomy
Heart Structures and Blood Flow **May 2023**
- PowerPoint lecture incorporated with think-pair-share group activities

Muscles and Joints **May 2023**
- Short lecture followed by groupwork to understand how muscles act on joints

CSUSB Biology 4240 – Animal Physiology
Tendons **Nov. 2021**
- PowerPoint presentation explaining tendon anatomy & physiology and my master's research

Invited Talks
CSUSB Office of Student Research Undergraduate Summer Research Program **July 2021**
- Opening talk sharing my academic journey with undergraduate researchers followed by a Q&A

ABSTRACTS AND PRESENTATIONS

American Association for the Advancement of Science, Pacific Division
- Talk: "A tale of two tails: material properties of kangaroo rat and lab rat tendons" **June 2024**

Winter Ecology and Evolutionary Biology Graduate Student Symposium
- Talk: "Regional variation in tendon fascicle properties." **Mar. 2024**

SICB National Meeting
- Talk: "Regional variation in tendon fascicle properties" **Jan. 2024**
- Talk: "Effects of wheel training intensity on tendon mechanics" **Jan. 2023**
- Talk (online): **Jan. 2022**
  "Jumping ahead of aging: exercise effects on early life mice tendon remodeling"
- Poster: **Jan. 2020**
  "The effects of different exercise regimens on tendon remodeling in mice (*Mus musculus)*"
- Poster: "Comparative kinematics of the forelimb during **Jan. 2019**
  terrestrial locomotion in semi-aquatic versus terrestrial salamanders"

SICB Regional Meeting, SWOB
- Poster: "Biomechanical comparisons of forelimb **Nov. 2018**
  function in walking semi-aquatic and terrestrial salamanders"

APS National Meeting **Apr. 2023**
- Poster: "Wheel running intensity effects on mice tendon mechanics."

Society of Experimental Biology Virtual Conference **July 2021**
- Talk: "Quantification of Jump Activity in Rodent Home Cages Using Wireless IR Sensors"

CSUSB Student Research Competition - 1st place in Bio. and Agricultural Sciences **Feb. 2021**
- Talk: "Exercise training to increase stress?"

CSUSB Meeting of the Minds, San Bernardino, California **May 2020**
- Talk: "Exercise training to increase stress?"

PROFESSIONAL TRAINING

Inclusive Mentoring Certificate – Integrative Movement Sciences Institute **Sep. 2024**
- Learned about navigating mentoring relationships considering mental health, mentee understanding, healthy boundaries, and more.

Graduate Leadership – Course 203B **Jan. – Mar. 2024**
- Co-organized the Winter Ecology and Evolutionary Biology Graduate Student Symposium where students from the department present oral and poster presentations of their research
- Collaborated on future departmental projects addressing department culture, program requirements, improvements to graduate courses, and more

Using Classroom Observation Protocol Data to Document Professional Growth in your Teaching
SABER West Workshop **Jan. 2024**
- Learned about the Classroom Observation Protocol for Undergraduate STEM (COPUS) to characterize how faculty and students are spending their time in the classroom
- Practiced using COPUS method to quantify and evaluate teaching practices

Certificate in Mentoring Excellence – UCI Graduate Division **Nov. 2023**
- Learned about effective mentoring practices including topics covering mentoring philosophies, identity salience, conflict resolution, and resilience.

Certificate in Inclusive Course Design
UCI Division of Teaching Excellence and Innovation **Aug. 2023**
- Assisted in converting a 300+ student class from an in-person to hybrid format
- Discussed how to incorporate specifications grading into a course design

Certificate of Teaching Excellence
UCI Division of Teaching Excellence and Innovation **May 2023**
- Applied pedagogy approaches taught in University studies 390X within a classroom setting
- Observed 3 classes and provided constructive feedback for the presenters, and vice versa 3 times

Intro to Higher Ed Research Workshop Series
UCI Division of Teaching Excellence and Innovation **Jan. – Mar. 2023**
- Learned about qualitative and quantitative approaches to address pedagogical questions
- Developed a comprehensive plan to study how reducing prerequisites affect pre-nursing student success in Anatomy and Physiology courses at CSUSB

University Studies 390X: Developing Pedagogy – UCI **Aug. – Dec. 2022**
- Learned about a variety of teaching topics including active learning, promoting inclusivity and accessibility, assessment types and selection, instructional technologies, and more
- Applied pedagogical approaches within simulated classes and discussed feedback from observers
- Designed a course syllabus for Anatomy and Physiology

Integrative Movement Sciences – UCI Summer Research Institute **July 2021**
- Collaborated with interdisciplinary scientists tackling biomechanical questions from different organizational scales
- Addressed how optimal control modeling could predict locomotor strategies of kangaroo rats competing for food resources

Issues-X Online Teaching Workshop – CSUSB **July 2020**

- Practiced applying computer applications for implementing group activities in a virtual setting (i.e. Google JamBoards)
- Learned different ways to encourage and maintain student engagement (i.e. Breakout rooms)

Broadening Participation Meeting Mentorship Program – SICB **Jan. 2018 – 2020, 2022**

- Acknowledged academic weaknesses with mentor and discussed exercises to strengthen them
- Coordinated meetings with students and faculty from potential labs for graduate school
- Discussed plans for success such as applying for the NSF Graduate Research Fellowship Program

SKILLS & ABILITIES

- Intermediate experience with RStudio to manipulate data (package: tidyverse), conduct statistics (i.e., linear regressions and ANCOVAs), and graph results (package: ggplot2)
- Intermediate experience with quantifying animal movements using XMALab and DLTdv5 in MATLAB
- Intermediate experience with quantifying materials properties using LabChart8, ProAnalyst, and IGOR