

Juan Pablo Giraldo

Assistant Professor
University of California, Riverside
Senior Investigator
NSF Center of Sustainable Nanotechnology

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Faculty Member Affiliations | Botany and Plant Sciences | Material Science and Engineering |
Microbiology | Cell Molecular and Developmental Biology

APPOINTMENTS

University of California, Riverside	Assistant Professor	2015-Present
Massachusetts Institute of Technology	NSF Postdoctoral Research Fellow Chemical Engineering Department	2011-2014

EDUCATION

Ph.D. Biology Harvard University Advisor: Noel Michele Holbrook	2005-2011 Cambridge, MA
B.S. Biology , with honors B.S. Physics , with honors University of Los Andes	2002 2001 Bogotá, Colombia
Minor, Modern and Contemporary Humanities Minor, French language and culture University of Los Andes	2002 2001 Bogotá, Colombia

SELECTED AWARDS AND HONORS

NSF CBET Environmental and Biological Interactions with Nanomaterials	\$250,000	2019-2022
USDA NIFA - AFRI	\$103,866	2019-2021
NSF Center for Sustainable Nanotechnology	\$452,925	2018-Present
NSF MCB Cell Dynamics and Function Cluster	\$299,195	2018-2021
University of California-Riverside Delfino Award	\$12,000	2019-2020
University of California-Riverside Collaborative Seed Grant	\$75,000	2016-2017
NSF Postdoctoral Fellowship in Biology	\$189,000	2011-2014
Sustainability Science Program Fellowship, Harvard University	\$25,000	2010-2011
Smithsonian Pre-doctoral Fellowship	\$17,000	2008-2009
Outstanding paper in Landscape Ecology by Laurance <i>et al.</i> , PNAS, 2006. The International Association of Landscape Ecologists		2006

PEER-REVIEWED PUBLICATIONS

*Denotes equal contribution

† Denotes corresponding author

29. Hu P, An J, Faulkner MM, Wu H, Li Z, Tian X, **Giraldo JP**[†]. Nanoparticle charge and size control foliar delivery efficiency to plant cells and organelles. *ACS Nano* (2020). <https://doi.org/10.1021/acsnano.9b09178>
28. Hofmann T, Lowry GV, Ghoshal S, Tufenkji N, Brambilla D, Dutcher JR, Gilbertson L, **Giraldo JP**, Kinsella JM, Landry MP, Lovell W, Naccache R, Paret ML, Pedersen JA, Unrine JM, White JC, Wilkinson KJ. 2020. Technology readiness and overcoming barriers to sustainably implement nanotechnology-enabled plant agriculture. *Nature Food* 1, 416–425 (2020). <https://doi.org/10.1038/s43016-020-0110-1>
27. Santana I, Wu H, Hu P, **Giraldo JP**[†]. Targeted delivery of nanomaterials with their cargoes in plants enabled by biorecognition motifs. *Nature Communications* 11, 2045 (2020). <https://doi.org/10.1038/s41467-020-15731-w>
26. An J, Hu P, Li F, Wu H, Shen Y, White J, Tian X, Li Z, **Giraldo JP**[†]. Molecular mechanisms of plant salinity stress tolerance improvement by seed priming with cerium oxide nanoparticles. *Environmental Science Nano* (2020). <https://doi.org/10.1039/D0EN00387E>
25. Wu H*, NiBler R*, Morris V, Herrmann N, Hu P, Jeon SJ, Kruss S[†], **Giraldo JP**[†]. 2020. Monitoring plant health with near infrared fluorescent H₂O₂ nanosensors. 2020. *Nano Letters* 20, 4, 2432–2442 (2020). <https://doi.org/10.1021/acs.nanolett.9b05159>
24. Selvaggio G, Preiss H, Chizhik A, NiBler R, Mann F, Lv Z, Oswald T, Spreinat A, Erpenbeck L, Grosshans J, Giraldo JP, Kruss S[†]. Exfoliated near infrared fluorescent nanosheets with ultra-high photostability and brightness for biological imaging. 2019. *Nature Communications* 11, 1495 (2020). <https://doi.org/10.1038/s41467-020-15299-5>
23. Spielman-Sun E, Avellan A, Bland G, Tappero R, Acerbo A, Unrine J, **Giraldo JP**, Lowry G[†]. Engineering nanoparticle surface charge influences uptake, translocation, and leaf distribution in vascular plants with contrasting anatomy. *Environmental Science Nano* (6): 2508-2519 (2019). <https://doi.org/10.1039/C9EN00626E>
22. Wang JW, Grandio EG, Newkirk GM, Demirer GS, Butrus S, **Giraldo JP**[†], and Landry M[†]. Nanoparticle-mediated genetic engineering of plants. *Molecular Plant* (12): 1037-1040 (2019). <https://doi.org/10.1016/j.molp.2019.06.010>
21. **Giraldo JP**[†], Wu H, Newkirk GM, Kruss S. 2019. Nanobiotechnology approaches for engineering smart plant sensors. *Nature Nanotechnology* (14): 541-553 (2019). <https://doi.org/10.1038/s41565-019-0470-6>

20. Djanaguiraman M, Nair R, **Giraldo JP**, Prasad PVV[†]. Cerium oxide nanoparticles decrease drought induced oxidative damage in sorghum leading to higher photosynthesis and grain yield. *ACS Omega* 3 (10): 14406-14416 (2018). <https://doi.org/10.1021/acsomega.8b01894>

19. Kwak SY, **Giraldo JP**, Lew TTS, Wong MH, Liu P, Jung Y, Koman VB, McGee MK, Olsen BD, Strano MS[†]. Polymethacrylamide and carbon composites that grow, strengthen and self-repair using ambient carbon dioxide fixation. *Advanced Materials* 30 (46): 1804037 (2018). <https://doi.org/10.1002/adma.201804037>

18. Wu H, Zhang X, **Giraldo JP**, Shabala S[†]. It is not all about sodium: revealing tissue specificity and signalling roles of potassium in plant responses to salt stress. *Plant and Soil* (431): 1-17 (2018). <https://doi.org/10.1007/s11104-018-3770-y>

17. Li JM*, Wu H*, Santana I, Falghren M, **Giraldo JP**[†]. Standoff optical glucose sensing in photosynthetic organisms by quantum dot fluorescent probe. *ACS Applied Materials and Interfaces* 10 (34): 28279-28289 (2018). <https://doi.org/10.1021/acsaami.8b07179>

16. Newkirk G*, Wu H*, Santana I, **Giraldo JP**[†]. Catalytic scavenging of plant reactive oxygen species *in vivo* by anionic sub-10 nm cerium oxide nanoparticles. *JOVE* (138): e58373 (2018). doi:10.3791/58373

15. Wu H, Shabala L, Shabala S, **Giraldo JP**[†]. Hydroxyl radical scavenging by cerium oxide nanoparticles improves Arabidopsis salinity tolerance by enhancing leaf mesophyll K⁺ retention. *Environmental Science Nano* (5): 1567-1583 (2018). <https://doi.org/10.1039/C8EN00323H>

Selected as one of the top 10% of papers published in *Environmental Science: Nano*

14. Kwak SY, **Giraldo JP**, Wong MH, Koman V, Lew TT, Ell J, Weidman M, Sinclair R, Landry M, Tisdale W, Strano MS[†]. A Nanobionic Light Emitting Plant. *Nano Letters* (17): 7951-7961 (2017). <https://doi.org/10.1021/acs.nanolett.7b04369>

13. Wu H, Tito N, **Giraldo JP**[†]. Anionic cerium oxide nanoparticles protect plant photosynthesis from abiotic stress by scavenging reactive oxygen species. *ACS Nano* (11): 11283-11297 (2017). <https://doi.org/10.1021/acsnano.7b05723>

Highlighted in Nature Nanotechnology News. 2018. J. White and J. Gardea-Torresdey (13), 627-629

12. Koman VB, Lew TTS, Wong MH, Kwak SY, **Giraldo JP**, Strano MS[†]. Persistent Drought Monitoring Using a Microfluidic-Printed Electro-Mechanical Sensor of Stomata *in planta*. *Lab on a Chip* (17): 4015-4024 (2017). <https://doi.org/10.1039/C7LC00930E>

11. Wu H, Santana I, Dansie J, **Giraldo JP**[†]. 2017. In vivo Delivery of Nanoparticles into Plant Leaves. *Current Protocols in Chemical Biology* (9): 269-284 (2017). <https://doi.org/10.1002/cpch.29>

10. Wong MH*, **Giraldo JP***, Kwak SY, Sinclair R, Koman V, Strano MS. Nitroaromatic Detection and Infrared Communication in Wild-Type Plants using Plant Nanobionics. *Nature Materials* (16): 264-274 (2016). <https://doi.org/10.1038/nmat4771>

Highlighted in Nature News. 2016. (539), 8

9. Wong MH, Misra R, **Giraldo JP**, Kwak SY, Son YW, Laundry MP, Swan JW, Blankschtein D, Strano MS[†]. Lipid Exchange Envelope Penetration (LEEP) of Nanoparticles for Plant Engineering: a Universal Localization Mechanism. *Nano Letters* 16 (2): 1161-1172 (2016). <https://doi.org/10.1021/acs.nanolett.5b04467>

8. **Giraldo JP***, Landry MP*, Kwak SY, Jain RM, Wong MH, Ben-Naim M, Strano MS[†]. A ratiometric sensor from single chirality carbon nanotubes: Application to in vivo monitoring. *Small* (11): 3973-3984 (2015). <https://doi.org/10.1002/sml.201403276>

7. **Giraldo JP**, Landry MP, Faltermeier SM, McNicholas TP, Iverson MN, Boghossian AA, Reuel NF, Hilmer AJ, Sen F, Brew JA, Strano MS[†]. Plant nanobionics approach to augment photosynthesis and biochemical sensing. *Nature Materials* (13): 400-408 (2014). <https://doi.org/10.1038/nmat3890>

Highlighted in Nature Materials News. 2014. G. Scholes and E. Sargent (13), 329-331

6. **Giraldo JP***, Wheeler JK, Huggett BA, Holbrook NM. The role of leaf hydraulic conductance dynamics on the timing of leaf senescence. *Functional Plant Biology* 41 (1): 37-47 (2013). <https://doi.org/10.1071/FP13033>

5. Boghossian AA, Sen F, Gibbons BM, Sen S, Faltermeier SM, **Giraldo JP**, Zhang CT, Zhang J, Strano MS[†]. Application of nanoparticle antioxidants to enable hyperstable chloroplasts for solar energy harvesting. *Advanced Energy Materials* 3 (7): 881-893 (2013). <https://doi.org/10.1002/aenm.201201014>

4. Zhang YJ, Meinzer FC, Hao GY, Scholz FG, Bucci SJ, Takahashi FSC, Villalobos-Vega R, **Giraldo JP**, Cao KF, Hoffmann WA, Goldstein G[†]. 2009. Size-dependent mortality in a neotropical savanna tree: the role of height related adjustments in hydraulic architecture and carbon allocation. *Plant Cell and Environment* 32 (10): 1456-1466 (2009). <https://doi.org/10.1111/j.1365-3040.2009.02012.x>

3. Kursar TA[†], Engelbrecht BMJ, Burke A, Tyree MT, El Omari B, **Giraldo JP**. Tolerance to low leaf water status of tropical tree seedlings is related to drought performance and distribution. *Functional Ecology* 23 (1): 93-102 (2009). <https://doi.org/10.1111/j.1365-2435.2008.01483.x>

2. Laurance W, Nascimiento H, Andrade A, Ribeiro JE, **Giraldo JP**, Lovejoy T, Condit R, Laurance S[†]. Rapid decay of tree-community composition in Amazonian forest fragments. *Proceedings of the National Academy of Sciences*. 103 (50): 19010-19014 (2006). <https://doi.org/10.1073/pnas.0609048103>

1. **Giraldo JP***. 2003. Change in vegetation cover of the tropical rain forest of National Natural Park Tinigua, Colombia. *Pérez Arbelaezja*, Journal of the Bogota Botanical Garden, Colombia. 14: 9-24.

MANUSCRIPTS IN REVIEW/SUBMITTED

30. Zhou H, Wu H, Zhang F, Su Y, Guan W, Xie Y, **Giraldo JP**[†], Shen W[†]. Enhanced nitric oxide production enables cerium oxide nanoparticle improvement of rice salt tolerance. *ACS Nano* (submitted)

BOOK CHAPTERS

Giraldo JP and NM Holbrook. 2011. Physiological mechanisms underlying the seasonality of leaf senescence and renewal in seasonally dry tropical forests trees. *Seasonally Dry Tropical Forests: Ecology and Conservation*. R. Dirzo, H. Young, H. Mooney and G. Ceballos. Washington DC, Island Press: 129-140.

NON-PEER REVIEWED ARTICLES

Strano MS and **Giraldo JP**. 2015. Plant nanobionics: Turning plants into technology. *Physics World*.

Giraldo JP. 2011. Linking leaf senescence to ecosystem productivity: physiological mechanisms and ecological processes. CID Working Paper No. 51, Harvard University Center for International Development. Cambridge, MA.

Giraldo JP. 2007. Brazilian Cerrados: Vanishing biodiversity. *REVISTA, Harvard Review of Latin America*. 6 (2): 60

PATENTS

Giraldo JP, Hu P, Santana I, Newkirk G. Plant chloroplast and mitochondria genetic engineering enabled by foliar sprayed nanoparticles. US provisional patent. Filed December 11, 2017

Giraldo JP, Honghong Wu, Nicholas Tito. Nanoceria Augmentation of Plant Photosynthesis Under Abiotic Stress. U.S. provisional patent 62/353,747. Filed June 23, 2016

Strano MS, **Giraldo JP**, Kwak S, Wong MH. Method for self-powered detection of nitroaromatics using a wildtype plant. U.S. provisional patent 62/262,892. Filed December 3, 2015.

Strano MS, Kwak S, **Giraldo JP**, Wong MH. Nanobionic light emitting plants. U.S. provisional patent 62/251,071. Filed November 4, 2015.

Giraldo JP, Strano MS, Landry MP. Ratiometric and multiplexing sensors from single chirality carbon nanotubes. U.S. Patent 62/052,767. Filed September 19, 2014.

Giraldo JP, Strano MS, Landry MP, Faltermeier SM. 2011. Nanobionic engineering of organelles and photosynthetic organisms. U.S. Patent 61/903,520. Filed November 13, 2013.

Giraldo JP, Strano MS, Landry MP, Faltermeier SM. 2011. Nanobionic engineering of organelles and photosynthetic organisms. International patent PCT/US2014/050127. Filed August 7, 2014.

SELECTED PRESENTATIONS

- 2020 **Gordon Research Conference on Bioanalytical Sensors (Invited)**. “Nanobiotechnology approaches to engineer smart plant sensors” Newport, RI. (Postponed due to pandemic)
- 2020 **5th International Symposium on Environmental Impact and Application of Engineered Nanoparticles (Invited)**. “Understanding and engineering plant function with nanotechnology”. Wuxi, China. (Canceled due to pandemic)
- 2020 **Santa Clara University, Biology seminar (Invited)**. “Studying and engineering plant function with nanotechnology” Santa Clara, CA.
- 2019 **University of California Davis, Plant Biology graduate seminar (Invited)**. “Studying and engineering plant function with nanotechnology” Davis, CA.
- 2019 **Sustainable Nanotechnology conference (Invited)**. “Turning plants into environmental sensing technology through nanoscale engineering” San Diego, CA.
- 2019 **Sustainable Nanotechnology conference (Invited)**. “Controlled nanomaterials for a nano-enabled sustainable agriculture” San Diego, CA.
- 2019 **International Congress on Photobiology (Invited)**. “Nanobiotechnology approaches for understanding and engineering the role of plant ROS” Barcelona, Spain.
- 2019 **Gordon Research Conference on Environmental Nanotechnology (Invited)**. “Turning plants into technology through nanobioengineering” Newry, ME
- 2019 **American Society of Chemistry meeting (Invited)**. “Improving plant stress tolerance through chloroplast nanobiotechnology” Orlando, FL
- 2019 **University of Kentucky, Plant and Soil Sciences Department (Invited)**. “Improving plant stress tolerance through chloroplast nanobiotechnology” Lexington, KY
- 2019 **Plant and Animal Genome (Invited)**. “Targeted chloroplast bioengineering by nanomaterials *in planta*” San Diego, CA
- 2018 **QUEEN II (Invited)**. “Targeted foliar delivery of nanomaterials for improving crop productivity and reducing human exposure” U.S labor department, DC
- 2018 **University of California, Riverside - IIGB symposium (Invited)**. “Targeted chloroplast bioengineering by nanomaterials in planta” Riverside, CA
- 2018 **Nano 2018 (Keynote speaker)**. “Targeted foliar delivery of nanoparticles to organelles for engineering plant stress tolerance” Duke University, NC
- 2018 **Gordon Research Conference on Nano-Enabled Technologies to Improve Efficiency, Quality, and Health in Food and Agriculture (Invited)**. “Targeted delivery of nanoparticles to organelles for understanding and engineering plant abiotic stress tolerance” Holyoke, MA
- 2018 **Stanford Bioengineering Department (Invited)** “Turning Plants into Technology through Chloroplast Nanobioengineering” Palo Alto, CA
- 2017 **International Tropical Agriculture Conference (Invited)** “A Nanobiotechnology Approach to Protect Plants from Abiotic Stress” Brisbane, Australia
- 2017 **Nanjing Agricultural University (Invited)** “Studying and Augmenting Plant Abiotic Stress Tolerance using Nanomaterials” Nanjing, China
- 2017 **Association of Plant Biology Meeting (Invited)** “A nanobiotechnology approach to study and protect plant photosynthesis from abiotic stress” Honolulu, HI.

2017 **University of California, Riverside Mechanical Engineering Department (Invited)** “A plant nanobiotechnology approach to study and augment photosynthesis and biochemical sensing” Riverside, CA.

2017 **University of California, Riverside Center for Plant Cell Biology (Invited)** “Biochemical detection and infrared communication from wild-type plants using plant nanobionics” Riverside, CA.

2016 **China Agricultural University (Invited)** “Plant Nanobionics: Augmenting Plant Photosynthesis and Biochemical Sensing with Nanotechnology” Beijing, China.

2016 **Los Alamos National Laboratory Frontiers Geosciences Seminar (Invited)** “Plant Nanobiotechnology: Augmenting Plant Function with Nanomaterials. Los Alamos, NM.

2016 **University of California, Riverside Chemistry Department (Invited)** “Engineering and Monitoring Plant Function with Nanomaterials” Riverside, CA

2016 **University of California, Los Angeles Ecology and Evolutionary Biology Department (Invited)** “A Nanobiotechnology Approach to Study and Engineer Plant Photosynthesis and Chemical Sensing” Los Angeles, CA.

2015 **University of California, Riverside Center for Plant Cell Biology (Invited)** “Engineering Chloroplast Light Reactions of Photosynthesis with Nanomaterials” Riverside, CA.

2015 **International Congress of Plant Molecular Biology (Invited)** “Augmenting Plant Photosynthesis and Free Radical Sensing with Nanomaterials” Iguazu falls, Brazil.

2014 **Common Scientific and Industrial Research Organization (CSIRO) (Invited)** “Nanobionic Approach to Augment Plant Function and Biochemical Sensing” Canberra, Australia.

2014 **University of California, Riverside Botany and Plant Sciences Department (Invited)** “A Nanobionic Approach to Enhance Plant Photosynthesis and Biochemical Sensing” Riverside, CA.

2013 **American Institute of Chemical Engineers** “A Plant Nanobionic Approach to Enhance Solar Energy Conversion of Extracted Chloroplasts Using Spontaneously Assembled Nanoparticles” San Francisco, CA.

2013 **International Congress on Photosynthesis** “A Plant Nanobionic Approach to Enhance Photosynthesis of Extracted Chloroplasts using Spontaneously Assembled Nanoparticles. St. Louis, MO.

2012 **Photosynthesis Gordon Conference** “Can Inorganic or Organic-Based Nanomaterials Enable Hyperstable Chloroplasts for Solar Energy Harnessing?” Poster presentation. Davidson College, NC.

2012 **Eni S.p.A. (Invited)** “Bio-Photoelectrochemical Cell Enabled by Single Walled Carbon Nanotubes” Milan, Italy.

2011 **Massachusetts Institute of Technology** “The Plant Vascular System as a Signaling System Regulating the Onset of Leaf Senescence” Cambridge, USA.

2010 **Association of Plant Biology Meeting** “Leaf Hydraulic Regulation of the Timing of Leaf senescence in Tomato (*Solanum lycopersicum*)” Poster presentation. Montreal, Canada.

2009 **Harvard University Herbaria Seminar (Invited)** “How Evergreen Plants Control Leaf Longevity: The Role of Leaf Hydraulic Conductance in Regulating Leaf Senescence” Cambridge, MA.

2004 **Association of Tropical Biology and Conservation Meeting** “Quantifying Desiccation Tolerance and Drought Performance of Tropical Seedlings for Predicting Plant Distributions” Miami, FL.

2004 **Smithsonian Tropical Research Institute Annual Symposium** “Quantifying Desiccation Tolerance and Drought Performance of Tropical Seedlings for Predicting Plant Distributions” Panama City, Panama.

TEACHING

Instructor, University of California, Riverside

Plant Physiology 2016-2019
Nanobiotechnology 2016-2020

Invited lecturer, Massachusetts Institute of Technology

Engineering Nanotechnology 2013

Teaching Fellow, Harvard University

Biology of Plants 2010
Foundations of Biological Diversity 2009
Ecology: Populations, communities and ecosystems 2007

Teaching Assistant, University of Los Andes

Physics laboratory IV (optics and quantum mechanics) 2002-2003
Physics laboratory I (Newtonian mechanics) 2003
Biophysics laboratory I (mechanics, fluids and thermodynamics for biologists) 2003
Physics laboratory II (waves, fluids and thermodynamics) 2001-2002
Biophysics laboratory II (optics, electricity and magnetism for biologists) 2001

MENTORING

University of California, Riverside

Postdoctoral researchers (4): Dr. Suji Jeon (2019-Present), Dr. Peiguang Hu (2017-Present), Dr. Honghong Wu (2015-2019), Dr. Jinming Li (2016-2017)

Graduate students (4): Christopher Castillo (2020-Present), Jing An (2017-Present), Gregory Newkirk, (2017-Present), Israel Santana (2016-Present).

Undergraduate students (8): Colleen Ahern (2019), Pedro Allende (2019-Present), Victoria Morris (2019), Maquela Faulkner (2018), Mackenzie Falghren (2017-2018), Joshua Dansie (2016-2017), Cristina Moreno-Borja (2016-2017), Nicholas Tito (2015-2016)

Massachusetts Institute of Technology

Postdoctoral researchers (1): Seonyeong Kwak

Graduate students (2): Sean Faltermeier, Min Hao Wong

Undergraduate students (4): Melissa McGee, Priyanka Sapute, Jacqueline Brew, Brenna M. Gibbons

Harvard University

Undergraduate students (2): James Onstad and Lee Dietterich

PROFESSIONAL AND ACADEMIC SERVICE

Reviewer for *Nano Letters*, *Angewandte Chemie*, *Proceedings of the National Academy of Arts and Sciences*, *New Phytologist*, *ACS Nano*, *Journal of Physical Chemistry*, *Analytical chemistry*, *Journal of Integrative Plant*

Biology, Tree Physiology, PLoS ONE, Sensors, Carbon, Environmental Science: Nano, Small, Communications Biology, Journal of the American Chemical Society, Nanoscale, Nature Plants.

NSF Center of Sustainable Nanotechnology Diversity Committee	2020-Present
Department Advancement Committee	2018-Present
Department Information Technology Committee	2017-Present
UCR First Generation Faculty	2017
Center of Plant Cell Biology (CEPCEB) Awards Committee	2016-2019
Batchelor Hall Renovations Committee	2016-2018
Institute for Integrative Genome Biology Seminar Committee	2018-2019

SYNERGISTIC ACTIVITIES

Mentoring Under-represented Students in STEM: I routinely advise students from under-represented groups, who have gone off to successful stem careers at UC Riverside, MIT, and other highly ranked institutions.

Public Dissemination: I have worked with news media to highlight the emerging field of plant nanobiotechnology. This activity has resulted in news features in CBS News, National Public Radio, Scientific American, Popular Mechanics, Time, Discovery News, Los Angeles Times, Physics World, and in an interview by a major US Hispanic and Latin American TV channel, NTN24.

Community Outreach: My lab participates at annual public outreach events at UC Riverside such as the UCR Engineering Day and UCR Plant Discovery Day, in which lab members interact with families from the Riverside area through hands on activities about how nanotechnology is used in plant and medical science research.

Course development: I have developed a new course on Nanobiotechnology at UC Riverside that is offered annually to graduate students about nanotechnology applications to medicine, plant biology, and agriculture. This course was approved to be offered to undergraduate students in 2021.

SACNAS MIT Chapter 2014: I was the Co-founder of the MIT chapter for the Society for the Advancement of Hispanics, Chicanos, and Native Americans in Science at the Massachusetts Institute of Technology.