

Esteban A. Orellana Vinueza, Ph.D.

Assistant Professor - E.E. Just Faculty Fellow

Department of Molecular and Systems Biology - Geisel School of Medicine at Dartmouth College

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APPOINTMENTS

- 07/2023 Assistant Professor, Department of Molecular and Systems Biology, Geisel School of Medicine at Dartmouth College
- 05/2018-07/2023 Research Fellow, Laboratory of Richard I. Gregory, Boston Children's Hospital, Harvard Medical School, Boston
RNA modifications
- 08/2012-05/2018 Graduate researcher, laboratory of Andrea Kasinski, Purdue University, Indiana
Thesis title: Enhancing miRNA therapeutic efficacy through combinatorial targeting and vehicle free delivery
- 08/2005-03/2011 Undergraduate researcher, laboratory of Alexandra Narvaez, PUCE, Ecuador
Thesis title: Mechanisms of pathogen resistance in Plants

EDUCATION

- 2012-2018 Ph.D., Department of Biology, Purdue University, West Lafayette, IN
2005-2011 B.A., Department of Biology, Pontificia Universidad Católica del Ecuador. Quito, Ecuador

HONORS

- 2023-2029 E. E. Just Faculty Fellow, Geisel School of Medicine at Dartmouth College
- 2023-2025 Damon Runyon-Dale F. Frey Award for Breakthrough Scientists
- 2019-2023 Damon Runyon Fellowship, Damon Runyon Cancer Research Foundation
- 2019-2021 Pew Latin American Fellowship, The Pew Charitable Trusts
- 2016-2017 Bisland Fellowship, Purdue University
- 2012-2016 Fulbright Scholarship, Fulbright Foreign Student Program, Ecuador
- 2012 -2013 Lynn Fellowship, Purdue University
- 2017 Outstanding Graduate Student in Research Award, Purdue University Interdisciplinary Life Sciences/ Department of Biological Sciences
- 2015 Travel Award, Latino Cultural Center, Purdue University
- 2015 Travel Award, Purdue University Interdisciplinary Life Sciences Program
- 2015 Travel Award, Purdue University Center for Cancer Research
- 2015 Incentive Grant, Purdue University
- 2014 Outstanding Preliminary Proposal, Purdue University Interdisciplinary Life Sciences
- 2011 Best graduate mention (*Summa Cum Laude*), Pontificia Universidad Católica del Ecuador

PUBLICATIONS

NCBI My Bibliography: <https://www.ncbi.nlm.nih.gov/myncbi/esteban.orellana.1/bibliography/public/>

1. Li J, Wang L, Hahn Q, Nowak RP, Viennet T, **Orellana EA**, et al. Structural basis of regulated m⁷G tRNA modification by METTL1-WDR4. *Nature*. 2023 Jan;613(7943):391-397. doi: 10.1038/s41586-022-05566-4. Epub 2023 Jan 4. PMID: [36599985](https://pubmed.ncbi.nlm.nih.gov/36599985/)

2. **Orellana, E.A.**, Siegal, E., and Gregory, R.I. (2022). tRNA dysregulation and disease. *Nat Rev Genet*. PMID: [35681060](#)
3. **Orellana, E.A.**, Liu, Q., Yankova, E., Pirouz, M., De Braekeleer, E., Zhang, W., Lim, J., Aspris, D., Sendinc, E., Garyfallos, D.A., et al. (2021). METTL1-mediated m(7)G modification of Arg-TCT tRNA drives oncogenic transformation. *Mol Cell* 81, 3323-3338.e3314. PMID: [34352207](#)
4. Chen, H., Gu, L., **Orellana, E.A.**, Wang, Y., Guo, J., Liu, Q., Wang, L., Shen, Z., Wu, H., Gregory, R.I., et al. (2020). METTL4 is an snRNA m(6)Am methyltransferase that regulates RNA splicing. *Cell Res* 30, 544-547. PMID: [31913360](#)
5. **Orellana, E.A.**, Li, C., Lisevick, A., and Kasinski, A.L. (2019). Identification and validation of microRNAs that synergize with miR-34a - a basis for combinatorial microRNA therapeutics. *Cell Cycle* 18, 1798-1811. PMID: [31258013](#)
6. **Orellana, E.A.**, Abdelaal, A.M., Rangasamy, L., Tenneti, S., Myoung, S., Low, P.S., and Kasinski, A.L. (2019). Enhancing MicroRNA Activity through Increased Endosomal Release Mediated by Nigericin. *Mol Ther Nucleic Acids* 16, 505-518. PMID: [31071527](#)
7. Hinze, L., Pfirrmann, M., Karim, S., Degar, J., McGuckin, C., Vinjamur, D., Sacher, J., Stevenson, K.E., Neuberg, D.S., **Orellana, E.**, et al. (2019). Synthetic Lethality of Wnt Pathway Activation and Asparaginase in Drug-Resistant Acute Leukemias. *Cancer Cell* 35, 664-676.e667. PMID: [30991026](#)
8. Rangasamy, L., Chelvam, V., Kanduluru, A.K., Srinivasarao, M., Bandara, N.A., You, F., **Orellana, E.A.**, Kasinski, A.L., and Low, P.S. (2018). New Mechanism for Release of Endosomal Contents: Osmotic Lysis via Nigericin-Mediated K(+)/H(+) Exchange. *Bioconjug Chem* 29, 1047-1059. PMID: [29446616](#)
9. **Orellana, E.A.**, Tenneti, S., Rangasamy, L., Lyle, L.T., Low, P.S., and Kasinski, A.L. (2017). FolamiRs: Ligand-targeted, vehicle-free delivery of microRNAs for the treatment of cancer. *Sci Transl Med* 9. PMID: [28768807](#).
10. **Orellana, E.A.**, and Kasinski, A.L. (2017). No vehicle, no problem. *Oncotarget* 8, 96470-96471. PMID: [29228541](#)
11. **Orellana, E.A.**, and Kasinski, A.L. (2016). Sulforhodamine B (SRB) Assay in Cell Culture to Investigate Cell Proliferation. *Bio Protoc* 6. PMID: [28573164](#)
12. Shaw, J.J., Spakowicz, D.J., Dalal, R.S., Davis, J.H., Lehr, N.A., Dunican, B.F., **Orellana, E.A.**, Narváez-Trujillo, A., and Strobel, S.A. (2015). Biosynthesis and genomic analysis of medium-chain hydrocarbon production by the endophytic fungal isolate *Nigrograna mackinnonii* E5202H. *Appl Microbiol Biotechnol* 99, 3715-3728. PMID: [25672844](#)
13. **Orellana, E.A.**, and Kasinski, A.L. (2015). MicroRNAs in Cancer: A Historical Perspective on the Path from Discovery to Therapy. *Cancers (Basel)* 7, 1388-1405. PMID: [26226002](#)
14. Kasinski, A.L., Kelnar, K., Stahlhut, C., **Orellana, E.**, Zhao, J., Shimer, E., Dysart, S., Chen, X., Bader, A.G., and Slack, F.J. (2015). A combinatorial microRNA therapeutics approach to suppressing non-small cell lung cancer. *Oncogene* 34, 3547-3555. PMID: [25174400](#)
15. González-Pérez, L., Perrotta, L., Acosta, A., **Orellana, E.**, Spadafora, N., Bruno, L., Bitonti, B.M., Albani, D., Cabrera, J.C., Francis, D., et al. (2014). In tobacco BY-2 cells xyloglucan oligosaccharides alter the expression of genes involved in cell wall metabolism, signalling, stress responses, cell division and transcriptional control. *Mol Biol Rep* 41, 6803-6816. PMID: [25008996](#)

PATENTS

Orellana, E.A. and Gregory, R.I. 2022. Methods and compositions for the treatment of cancer by targeting oncogenic transfer RNAs. U.S. Provisional No.: 63/358,280

CONFERENCES AND SEMINARS

- 2023 Invited speaker, Hospital for Sick Children (SickKids), Department of Molecular Medicine
2023 Invited speaker, Scripps Research Institute
2023 Invited speaker, St. Jude's Research Hospital, Division of Oncology
2023 Invited speaker, Ohio State University, Department of Molecular Genetics
2023 Invited speaker, Emory University, Department of Biochemistry
2023 Invited speaker, Fox Chase Cancer Center, Epigenetics Program
2023 Invited speaker, Karoliska Institutet, SciLifeLab Program
2023 Invited speaker, Vanderbilt University, Department of Biochemistry
2023 Invited speaker, Mayo Clinic, Department of Molecular and Cellular Biology
2023 Invited speaker, University College London, Laboratory for Molecular Cell Biology
2022 Invited speaker, Geisel School of Medicine - Dartmouth College, Molecular and Systems Biology
2022 Invited speaker, Case Western University, Department of Biochemistry
2022 Invited speaker, Wistar Institute, Gene Regulation
2022 Invited speaker, University of Pennsylvania, Department of Physiology
2022 Invited speaker, Baylor College of Medicine - THINC
2022 Invited speaker, Science on tap seminar series at Boston College
2022 Invited speaker - short talk, CSHL meeting Regulatory & non-coding RNAs, New York
2022 Talk at the Pew Latin American Fellow's retreat, Newport, CA
2021 Poster at the Pew Latin American Fellow's retreat, Virtual
2021 Invited speaker - short talk, RNA Mini Symposium – SUNY Albany
2020 Poster at the 2020 Bay Area RNA Conference
2020 Invited speaker – seminar at Universidad De las Américas, Quito, Ecuador.
2020 Invited speaker – seminar at Universidad Tecnológica Equinoccial, Quito, Ecuador.
2019 Poster at the Harvard Initiative for RNA Medicine retreat, Boston
2019 20th Annual Pediatric Hematology/Oncology retreat - Dana Farber Cancer Center
2017 Poster - American Association for Cancer Research meeting, Washington, DC.
2017 Invited speaker, Purdue University Interdisciplinary Life Sciences Seminar Series
2016 Department of Biochemistry, Purdue University, West Lafayette, IN
2016 Selected speaker - short talk, Chromatin and Epigenetics Symposium - Purdue University
2016 Chromatin & Epigenetics Symposium, West Lafayette, IN
2015 Selected speaker - short talk, Keystone Symposia - miRNAs and Noncoding RNAs in Cancer
2014 Department of Biochemistry, Purdue University, West Lafayette, IN
2011 XVI Latin-American Congress of Phytopathology, Bogotá, Colombia

PROFESSIONAL ACTIVITIES

Teaching Experience

- 2012 - 2018 Teaching Assistant, Advanced Animal Physiology Laboratory, Purdue University
2009 - 2012 Teaching Assistant, Molecular Biology Laboratory, Pontificia Universidad Católica del Ecuador

Mentorship Experience

2021 Visiting graduate student, Medical school, Utrecht University, Elisabeth Siegal
2021 Visiting graduate student, Biological sciences, Universidad Internacional del Ecuador,
Jennyfer Garcia-Cardenas
2015- 2018 Undergraduate student, Biological sciences, Purdue University, Alexa Lisevick
2015-2016 Undergraduate student, Biological sciences, Purdue University, Kayla Gates

Service and Peer Review Activities

Orellana, E.A. and Gregory, R.I. 2023. How Cancer Cells Hijack Protein Production to Grow Quickly. Frontiers for Young Minds. doi: 10.3389/frym.2023.961033

Science outreach: I participate in scientific communication events with underrepresented minorities from Latin America, especially in Ecuador. I also participate in children education through the Frontiers for Young Minds program.

Peer reviewer at the following journals: Molecular Therapy, Cell Cycle, Trends in Cancer, Targeted Oncology.

REFERENCES

Graduate Advisor

Andrea Kasinski, PhD
William and Patty Miller Assistant Professor
of Biological Sciences
Department of Biology
Purdue University
E-mail: akasinski@purdue.edu

Postdoctoral Advisor

Richard I. Gregory, PhD
Professor, Department of Pediatrics
Department of Biological chemistry and Molecular
Pharmacology
Stem Cell Program at Boston Children's Hospital
Harvard Medical School
E-mail: richard.gregory@enders.tch.harvard.edu

Collaborator/Mentor

Peter C. Dedon, MD, PhD
Underwood-Prescott
Singapore Professor Biological Engineering
Massachusetts Institute of Technology
E-mail: pcdedon@mit.edu

Collaborator/Mentor

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Boston Children's Hospital
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