

Thomas F. Martínez, Ph.D.

Salk Institute for Biological Studies
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EDUCATION AND TRAINING

- 2015- **Salk Institute for Biological Studies**
 NIH NRSA Postdoctoral Fellow
Annotation and characterization of human smORF encoded-microproteins;
Advisor: Prof. Alan Saghatelian
- 2009-15 **California Institute of Technology (Caltech)**
 Ph.D. in Biochemistry and Molecular Biophysics
Investigations of Pyrrole-Imidazole Polyamide Effects on DNA Replication;
Advisor: Prof. Peter B. Dervan
- 2005-09 **Massachusetts Institute of Technology (MIT)**
 B.S. in Biological Engineering

EXPERIENCE

- 2020- **External Consultant**
- Bioinformatics-based analyses aimed at identifying novel disease-relevant microproteins as potential therapeutic targets
- 2015- **NIH NRSA Postdoctoral Fellow**
Saghatelian Laboratory, Salk Institute for Biological Studies
- Developed an integrative approach for the discovery of functional microproteins encoded by small open reading frames using a combination of Ribo-Seq, RNA-Seq, mass spectrometry, and bioinformatics
 - Characterized the functions of several newly discovered microproteins involved in mitochondrial translation, cell stress, and differentiation
 - Led multiple sponsored research agreements with industry partners focused on discovering microproteins related to specific disease areas
- 2010-15 **NIH NRSA Predoctoral Fellow**
Dervan Laboratory, Caltech Department of Chemistry & Chemical Engineering
- Demonstrated that DNA-binding pyrrole-imidazole polyamides targeted to the androgen response element inhibit DNA replication in prostate cancer
 - Discovered Non-canonical ATR-dependent, Chk1-independent DNA damage response elicited by polyamide treatment
- 2008-09 **Undergraduate Research Assistant**
Stubbe Laboratory, MIT Department of Chemistry
- Incorporated 3-amino-L-tyrosine into the beta subunit of human ribonucleotide reductase by non-sense suppression for investigation of putative proton coupled electron transfer mechanism

- 2007-08 **Undergraduate Research Assistant**
Ge Laboratory, Whitehead Institute for Biomedical Research
- Synthesized siRNAs and tested predicted genetic interactions within TGF- β pathway in *C. elegans* by RNAi screens

RESEARCH FUNDING

- 2017 NIH NRSA Postdoctoral Fellowship (F32) – F32GM123685
2011 NIH NRSA Predoctoral Fellowship (F31) – F31CA159896
2009 Sloan Foundation Minority Predoctoral Fellowship

AWARDS & HONORS

- 2020 Best Poster Award – JAX Course on “Experimental Models of Human Cancer”
2009 Sigma Xi, MIT Chapter
2009 Outstanding Undergraduate Research Award, MIT Dept of Chemistry
2009 Combining Academic Excellence with Outstanding Contributions to the Undergraduate Curriculum and Professional Culture Award, MIT Dept of Biological Engineering
2008 MIT Amgen Scholar

PUBLICATIONS

* denotes equal contribution; † denotes co-corresponding author

1. Koh, M., Ahmad, I., Ko, Y., Zhang, Y., **Martinez, T.F.**, Diedrich, J.K., Chu, Q., Moresco, J.J., Erb, M.A., Saghatelian, A., Schultz, P.G., Bollong, M.J. A Short ORF-encoded Transcriptional Regulator. *PNAS* (2020). [Accepted]
2. **Martinez, T.F.**, Vaughan, J., Saghatelian, A. Insights into GLP-1 Receptor Activation with a Nonpeptide Agonist. *Biochemistry* 59(16), 1549-1559 (2020). [Viewpoint]
3. Chen C., Li Y., Jia T., He L., Hare A.A., Silberstein A., Gallagher J., **Martinez, T.F.**, Stiles J.W., Olenyuk B., Dervan P.B., Stiles B.L. Repression of the transcriptional activity of ERR α with sequence-specific DNA-binding polyamides. *Med Chem Res.* 29, 607-616 (2020).
4. **Martinez, T.F.**†, Chu, Q.C., Donaldson C., Tan, D., Shokhirev, M., Saghatelian, A.† Accurate annotation of protein-coding small open reading frames in multiple human cell lines. *Nat Chem Biol* 16, 458-468 (2019).
 - F1000Prime Recommended Article
5. Chu, Q., **Martinez, T.F.**, Novak, S.W., Donaldson, C., Tan, D., Vaughan, J.M., Chang, T., Diedrich, J.K., Andrade, L., Kim, A., Zhang, T., Manor, U.†, Saghatelian, A.† Regulation of the ER stress response by a Mitochondrial Microprotein. *Nat Commun* 10, 4883 (2019).
6. Choi, S.H., **Martinez, T.F.**, Kim, S., Donaldson, C., Shokhirev, M.N., Saghatelian, A. & Jones, K.A. CDK12 phosphorylates 4E-BP1 to enable mTORC1-dependent translation and mitotic genome stability. *Genes Dev* 33, 418-435 (2019).
7. Rathore, A., **Martinez, T.F.**, Chu, Q. & Saghatelian, A. Small, but mighty? Searching for human microproteins and their potential for understanding health and disease. *Expert Rev Proteomics* 15, 963-965 (2018). [Review]
8. Rathore, A., Chu, Q., Tan, D., **Martinez, T.F.**, Donaldson, C.J., Diedrich, J.K., Yates, J.R., 3rd & Saghatelian, A. MIEF1 Microprotein Regulates Mitochondrial Translation. *Biochemistry* 57, 5564-5575 (2018).

9. Hargrove, A.E., **Martinez, T.F.**, Hare, A.A., Kurmis, A.A., Phillips, J.W., Sud, S., Pienta, K.J. & Dervan, P.B. Tumor Repression of VCaP Xenografts by a Pyrrole-Imidazole Polyamide. *PLoS One* 10, e0143161 (2015).
10. **Martinez, T.F.***, Phillips, J.W.*, Karanja, K.K., Polaczek, P., Wang, C.M., Li, B.C., Campbell, J.L.† & Dervan, P.B.† Replication stress by Py-Im polyamides induces a non-canonical ATR-dependent checkpoint response. *Nucleic Acids Res* 42, 11546-59 (2014).

PRESENTATIONS

Invited Lectures

1. **Martinez, T.F.** Annotation and Characterization of Human Protein-coding Small Open Reading Frames. St. Jude Children's Research Hospital – Chemical Biology and Therapeutics Seminar. December 21, 2020.
2. **Martinez, T.F.** Annotation and Characterization of Human Protein-coding Small Open Reading Frames. Columbia University Irving Medical Center – Molecular Pharmacology and Therapeutics Seminar. December 17, 2020.
3. **Martinez, T.F.** Annotation and Characterization of Human Protein-coding Small Open Reading Frames. Perelman School of Medicine at the University of Pennsylvania – Biochemistry and Molecular Biophysics Seminar. November 2, 2020.

Other Selected Presentations

1. **Martinez, T.F.**, Chu, Q.C., Donaldson C., Tan, D., Shokhirev, M., Saghatelian, A. Accurate annotation of protein-coding small open reading frames in the Human Genome. "Experimental Models of Human Cancer" JAX course (poster). Aug 20, 2020.
2. **Martinez, T.F.** Accurate Annotation of Protein-coding Small Open Reading Frames in the Human Genome. ASBMB Annual Meeting – Experimental Biology (Spotlight Session Talk - Webinar). June 2, 2020. [Cancelled]
3. **Martinez, T.F.**, Chu, Q.C., Donaldson C., Tan, D., Shokhirev, M., Saghatelian, A. Accurate annotation of protein-coding small open reading frames in the Human Genome. Salk Institute Science at the Seaside Retreat (poster). Oct 30, 2019.
4. **Martinez, T.F.** Accurate annotation of protein-coding small open reading frames in multiple human cell lines. Salk Institute - Helmsley Center for Genomic Medicine Seminar. Oct 16, 2019.
5. **Martinez, T.F.** Accurate annotation of protein-coding small open reading frames in multiple human cell lines. Salk Institute - Metabonauts Seminar. May 31, 2019.
6. **Martinez, T.F.**, Chu, Q.C., Donaldson C., Tan, D., Shokhirev, M., Saghatelian, A. Accurate annotation of protein-coding small open reading frames in multiple human cell lines. Gordon Research Conference: Translational Machinery in Health and Disease (poster). Feb 17-22, 2019.
7. **Martinez, T.F.**, Chu, Q.C., Donaldson C., Shokhirev, M., Saghatelian, A. Annotation of protein-coding small open reading frames in the human genome. Peptide Therapeutics Symposium (poster). Oct 25-26, 2018.
8. **Martinez, T.F.**, Chu, Q.C., Donaldson C., Shokhirev, M., Saghatelian, A. Annotation of protein-coding small open reading frames in the human genome. Gordon Research Conference: Chemistry and Biology of Peptides (poster). Feb 11-16, 2018.

9. **Martinez, T.F.** Replication Stress by Py-Im Polyamides Induces a Non-canonical ATR-dependent Checkpoint Response. Caltech - Center for the Chemistry of Cellular Signaling Seminar. Dec 4, 2014.

TEACHING & OUTREACH

- 2019 Salk Institute High School Science Day, Lab Tour & Demo Leader
2018 Salk Institute Education Outreach, Lab Tour & Demo Leader (Cardinals Interact Program)
2017 Avanza Network, Middle School Seminar on Exploring Careers in Science (Logan K-8)
2016 Explore Salk, "Discoveries for Health" Booth
2016-17 Research Mentor, UCSD Masters Student
2015 Guest Discussion Facilitator, BGGN220F - Graduate Mol. Biol.; UCSD
2013-14 Research Mentor, Summer Undergraduate Research Fellowship (SURF); Caltech
2011 Teaching Assist., Ch41b - Organic Chemistry; Caltech
2010 Teaching Assist., Bi8 - Introduction to Molecular Biology; Caltech
2007 & 2009 Teaching Assist., Biochemistry - Minority Introduction to Engineering and Science (MITES); MIT
2007 Teaching Assist., 7.02 - Experimental Biology and Communication; MIT

SERVICE

Professional Service

- 2020- Ad hoc journal reviewer: *Biochemistry*
2017 Keystone Symposia Conference Assistant - Omics Strategies to Study the Proteome. Jan 29- Feb 2, 2017.

Institute Service

- 2020- Founder - Salk Institute URM affinity group: "Underrepresented Minorities Actively Supporting Excellence (URMase)"
2020- Salk Institute Campus Culture Advisory Committee Member
2010 Caltech Graduate Student Council Member