

Erik Torres Hernandez
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Education

The University of Texas at Austin, Austin, TX

Ph.D. Organic Chemistry, advisor Prof. Eric V. Anslyn, Ph.D.

Exp. Dec. 2016

Oberlin College, Oberlin, OH

Bachelor of Arts, Chemistry (ACS Certified), advisor Prof. Norman C. Craig, Ph.D.
Bachelor of Arts, History

Sept. 2007-May 2011

Technical Skills

Organic Chemistry

Peptide Synthesis Manual/Microwave
Solid-phase synthesis
Gas-phase synthesis

HPLC
Combi-Flash
Flash-column chromatography
Preparative Gas Chromatography

NMR
LC-MS/MALDI-MS
FT-IR Spectroscopy
UV-Vis Spectroscopy

Biochemistry/Molecular Biology

Peptide labeling
Protein digestion

Centrifuge
Lyophilizer

TIRF Microscopy
Single-molecule imaging
Well-plate reader

Software/Computation

ChemDraw
MestReNova

Agilent MassHunter LC-MS
Agilent Qualitative Analysis

Nikon Elements Imaging
Python (Exposure)
Spartan

Research Experience

The University of Texas at Austin

Jan. 2012-Present

- Developed a sequential and selective peptide modification scheme targeting the most reactive natural amino acid residues using established mass tags
- Optimized the sequence of chemistry steps for Edman degradation of immobilized peptides on a glass surface
- Established methodologies to introduce unnatural side chains to peptides: bipyridines, terpyridines, boronic acids, hydrazides, and aldehydes
- Developed methodologies to label natural and unnatural amino acid residues with fluorophores
- Imaged fluorescently labeled peptides at the single-molecule level
- Sequenced single-molecule peptides using microscopy by Edman degradation
- Synthesized peptides used in binding studies of amplified oligonucleotides immobilized on a next-generation sequencing chip
- Designed and synthesized pH-responsive boronic acid-guanidinium monomers capable of forming linear/cyclic oligomers and supramolecular polymers in aqueous environments

Oberlin College

Jun. 2010-May 2011

- Targeted 1,4,7-triazacyclononane as a synthetic compound to incorporate into a silica framework for heterogeneous catalysis and chromatographic supports
- Synthesized in the gas-phase ²H and ¹³C isotopomers of cis,cis and trans,trans isomers of 1,4-difluorobutadiene to acquire rotational constants using high-resolution infrared, microwave spectroscopy and quantum mechanical calculations

Texas Tech University

Summer 2009

- Synthesized N-phosphonyl and N-phosphinyl imines as chiral and achiral reagents for organic synthesis

Publications

- Swaminathan, Jagannath; Hernandez, Erik T.; Bardo, Angela M.; Boulgakov, Alexander A.; Bachman, Logan; Johnson, Amber; Marotta, Joseph; Anslyn, Eric V.; Marcotte, Edward M. "Peptide Sequence Information can be Obtained at the Level of a Single Molecule." *Manuscript in preparation*.
- Hernandez, Erik; Swaminathan, Jagannath; Marcotte, Edward M.; Anslyn, Eric V. "Peptide Modification Chemistry: Solution-phase and Solid-phase Sequential, Selective Modification of Side Chains in KDYWEC and KDYWE." *Submitted*.
- Hernandez, Erik; Kolesnichenko, Igor; Reuther, James F. "Secondary-Amine Introduction to Peptides and Subsequent Derivatization with 2-(Bromomethyl)phenylboronic acid." *Manuscript in preparation*.
- Diehl, Katherine. L.; Hernandez, Erik. T.; et. al.; Anslyn, Eric. V. Invited Book Chapter: "Design and Synthesis of Synthetic Receptors for Biomolecule Recognition" in *Synthetic Receptors for Biomolecules: Design Principles and Applications*. RSC Publishing. Edited by Bradley D. Smith. **2015**, 39-80.
- Li, Wie; Yuan, Wie; Shi, Min; Hernandez, Erik; Li, Guigen. Rhodium(I)-Catalyzed Intramolecular Ene Reaction of Vinylidenecyclopropanes and Alkenes for the Formation of Bicyclo[5.1.0]octylenes. *Org. Lett.* **2010**, *12*, 64-67.

Patents

- Edward M. Marcotte, Jagannath Swaminathan, Erik Hernandez, Alexander Boulgakov, Amber Johnson, James Bachman, Helen Seifert, Andrew D. Ellington, and Eric V. Anslyn. US. Patent: PCT/US2015/060099

Teaching Experience

- Project Director for Undergraduates: managed a group of nine undergraduates divided into teams with specific research projects; two students were accepted into medical school
- Freshmen Research Initiative (FRI) Teaching Assistant: taught general chemistry lab with an emphasis on lab skills needed to conduct actual research under the supervision of Prof. Eric V. Anslyn, and helped foster small communities of underrepresented students in the natural sciences (2 semesters)
- General Chemistry Teaching Assistant (300 students): office hours, exam review sessions, proctoring exams, grading exams, and using the Quest grading system to record students grades (2 semesters)
- Organic Chemistry Lab Teaching Assistant (3 semesters)

Awards & Recognitions

- Finalist at the Texas Venture Labs Investment Competition Feb. 2015
- Lab Safety Competition 1st Prize Jan. 2015
- Intellectual Entrepreneurship Kuhn Scholar Pre-Graduate School Mentor Award Spring 2014
- Alfred P. Sloan Scholarship Spring 2012
- Diversity Recruitment Fellowship Fall 2011
- First-year Recruitment Fellowship Fall 2011
- Questbridge Scholarship (full-ride) Fall 2007- Spring 2011

Languages

- American English
- Mexican Spanish

References

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