

Mark Alan Hix

PHD · COMPUTATIONAL CHEMISTRY AND BIOCHEMISTRY

 markahix  @markahix

Education

University of North Texas

Denton, TX, USA

PH.D., PHYSICAL CHEMISTRY

June 2017 - October 2021

- Molecular dynamics simulation of proteins
- Quantum mechanical modeling of small molecules
- QM/MM calculations
- Method development
- Protein engineering

University of North Texas

Denton, TX, USA

B.S. IN CHEMISTRY

Completed May 2017

- Mathematics Minor
- ACS Certified
- Areas of Concentration: Biochemistry, Medical Applications, Computational Chemistry

Skills

PROGRAMMING LANGUAGES

- C++
- Python
- Bash
- LaTeX
- FORTRAN

SOFTWARE

- Gaussian
- AMBER/AmberTools
- Tinker
- OpenMM

Work Experience

GEICO

Dallas, TX, USA

INSURANCE SALES AGENT

August 2012 - March 2016

- Licensed for Personal Property and Casualty Lines in Texas, Colorado, Oklahoma, Nebraska, and Kansas

State Garden

Boston, MA, USA

DRY GOODS SUPERVISOR

December 2011 - August 2012

- Managed team in produce packaging facility.
- Maintained logistical supply lines for packaging and labeling.

IKON Office Services

SHIFT SUPERVISOR

*Boston, MA, USA
May 2009 - November 2011*

- Managed office services for a law firm
- Processed documents for legal cases, copy jobs, etc.

Best Buy

DEPARTMENT SUPERVISOR

*Saugus, MA, USA
May 2007 - November 2009*

- Managed department of several employees
- Maintained training levels, improved sales, kept up to date on latest consumer electronics trends.

Staples

DEPARTMENT SUPERVISOR

*Revere, MA, USA
July 2005 - May 2007*

- Managed team of multiple people
- Responsible for improving sales numbers with a focus on profitable add-on selling.

Teaching Experience

Teaching Assistant, Computational Chemistry Instructional Laboratory

Denton, TX, USA

UNIVERSITY OF NORTH TEXAS

Spring 2020

- Assisted students with use of various chemistry-related programs.
- Provided guidance for students learning computational modeling.
- General chemistry tutoring.

Teaching Assistant, Computational Chemistry Lecture

Denton, TX, USA

UNIVERSITY OF NORTH TEXAS

Fall 2018

- Assisted with class assignments and helped students work through computational problems

Teaching Assistant, Physical Chemistry Laboratory

Denton, TX, USA

UNIVERSITY OF NORTH TEXAS

Fall 2017 - Spring 2018

- Taught two sections of Physical Chemistry Lab in each semester.
- Set up and administered lab experiments ranging from thermodynamics to quantum mechanics experimentation
- Developed guide for future TAs to make lab administration easier and more consistent.

Chemistry Resource Center Tutor

Denton, TX, USA

UNIVERSITY OF NORTH TEXAS

Spring 2017

- Tutored undergraduate chemistry students in general, organic, physical, and analytical chemistry.
- Guided students through homework problems and lab reports, assisted with critical thinking and problem analysis.

Undergraduate Study Group Leader

Denton, TX, USA

UNIVERSITY OF NORTH TEXAS

2016 - 2017

- Worked with other undergraduate students to develop study plans and review relevant course material.
- Test preparation and homework assistance.

Professional Development

MolSSI

Austin, TX, USA

MOLSSI SOFTWARE SUMMER SCHOOL

July 2019

- Software development workshop focused on best practices, collaboration, project development, and testing.
- Python, C++, Git

IWOMP

Mountain View, CA

IWOMP 2020 TUTORIALS PROGRAM

September 21, 2020

- Software Development using OpenMP for efficient parallelization of code
- C++, OpenMP

Awards

2019-2020

- 1st Place - Third Year Graduate Seminar Series, UNT Chemistry Department.
- UNT Tuition Grant - Graduate
- Graduate Student Travel Grant

2018-2019

- Mary D. Walsh Endowed Scholarship
- Toulouse Graduate School Academic Achievement Scholarship
- Texas Public Education Grant
- UNT Tuition Grant - Graduate

2017-2018

- Chemistry Centennial Celebration Student Endowment
- Toulouse Graduate School Academic Achievement Scholarship
- UNT Tuition Grant - Graduate

2016-2017

- UNT Tuition Grant - Undergraduate

2014-2016

- Dean's List

Posters and Presentations

- Hix, Mark A.; Cisneros, G. Andrés. "Computational Investigation into Polymorphism of APOBEC3H and Mechanism of DNA Recognition." **Poster**. NSF CAC Fall IAB Meeting at the University of North Texas, **Oct. 22-23, 2018**.
- Hix, Mark A.; Cisneros, G. Andrés. "Computational Investigation into Polymorphism of APOBEC3H and Mechanism of DNA Recognition." **Poster**. RCS Twitter Poster Conference, Worldwide **March 5, 2019**.
- Hix, Mark A. "Computational Investigation into Polymorphism of APOBEC3H and Mechanism of DNA Recognition." **Presentation**. 52nd Annual ACS Meeting-in-Miniature **April 27, 2019**.

- Hix, Mark A.; Wong, Lai; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés. “Computational investigation of APOBEC3H cancer mutant and determination of substrate orientation and selectivity.” **Poster**. RCS Twitter Poster Conference, Worldwide **March 3, 2020**.
- Hix, Mark A.; Wong, Lai; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés. “Computational investigation of APOBEC3H cancer mutant and determination of substrate orientation and selectivity.” **Poster**, Sci-Mix. 259th American Chemical Society National Meeting & Exposition (hosted online due to COVID-19). **March 24, 2020**.
- Hix, Mark A.; Wong, Lai; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés. “Computational investigation of APOBEC3H cancer mutant and determination of substrate orientation and selectivity.” **Poster**, Sci-Meet 2020 (Online due to COVID-19). **April 28, 2020**. <https://doi.org/10.1021/scimeetings.0c00174>
- Hix, Mark A.; Wong, Lai; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés. “Computational investigation of APOBEC3H cancer mutant and determination of substrate orientation and selectivity.” **Poster**, Virtual Conference on Theoretical Chemistry 2020. **July 27, 2020**.
- Hix, Mark A.; Wong, Lai; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés. “Computational investigation of APOBEC3H cancer mutant and determination of substrate orientation and selectivity.” **Poster**, LatinXChem 2020. **September 7, 2020**.
- Hix, Mark A.; Cisneros, G. Andrés. “Divergence in Dimerization and Activity of Primate APOBEC3C” **Presentation**. Pacifichem 2021, **December 18, 2021**.

Publications

- Gaba, Amit*; Hix, Mark A.*; Suhail, Sana; Flath, Ben; Boysan, Brock; Williams, Danielle R.; Pelletier, Tomas; Emerman, Michael; Morcos, Faruck; Cisneros, G. Andrés; Chelico, Linda; “Divergence in dimerization and activity of primate APOBEC3C”, *submitted*, **August 2021**
- Hix, Mark A.; Leddin, Emmett M.; Cisneros, G. Andrés “Combining Evolutionary Conservation and Quantum Topological Analyses to Determine QM Subsystems for Biomolecular QM/MM Simulations”, *Journal of Computational and Theoretical Chemistry* DOI: <http://doi.org/10.26434/chemrxiv.14343137>, **May 25, 2021**
- Hix, Mark A.*; Wong, Lai*; Flath, Ben; Chelico, Linda; Cisneros, G. Andrés “Single-nucleotide polymorphism of the DNA cytosine deaminase APOBEC3H haplotype I leads to enzyme destabilization and correlates with lung cancer”, *NAR Cancer* DOI: <https://doi.org/10.1093/narcan/zcaa023>, **September 17, 2020**
- Hix, Mark A.; Cisneros, G. Andrés “Computational Investigation of APOBEC3H Substrate Orientation and Selectivity” *J. Phys. Chem. B*, DOI:<https://doi.org/10.1021/acs.jpcc.0c01857>, **April 22, 2020**

- Lohrman, J.; Vazquez-Montelongo, E. A.; Pramanik, S.; Day, V.; Hix, Mark A.; Bowman-James, K.; Cisneros, G. Andrés "Characterizing Hydrogen Bond Interactions in Pyrazine Tetracarboxamide Complexes: Insights from Experiment and Quantum Topological Analyses" *Inorg. Chem.*, DOI: 10.1021/acs.inorgchem.8b00627, **August 8, 2018**

*indicates authors contributed equally

MANUSCRIPTS IN PREPARATION

- Hix, Mark A.; Loo, Christian; Wang, Tong; Kohli, Rahul; Cisneros, G. Andrés "Investigation of drivers for preferential carboxy-S-adenosyl-L-methionine synthesis by M.Mpel variants"