

Andres Cordoba

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Education

Duke University - GPA 3.908 August 2020 – Present
Biophysics B.S. and Chemistry B.S. Durham, NC

Iowa State University - GPA 3.98 August 2018 – May 20
Liberal Arts and Science - Special Ames, IA

Research Experience

Combining QM and ML toward improved protein interactions January 2023 – Present
Duke University - Dr. Weitao Yang Durham, NC

- Developed skills through semester long Quantum Chemistry specific course
- Acquired TensorFlow, GROMACS and C experience and brushed up on python knowledge and MD force field idiosyncrasies
- Gained significant ground knowledge on the use of neural network in energy/force calculations and system decomposition

Using biophysical metrics in rigid body protein-protein docking May 2023 – August 2023
Yale University - Dr. Corey O'Hern New Haven, CT

- Helped uncover the deficiencies in current scoring protein-protein docking scoring functions and versatility and drawbacks of biophysical metrics
- Substantially improved cluster and python skills to work merge
- Developed skills working with versatile neural network frameworks specific to PPI and generally used such as PyTorch, TensorFlow and SciKit Learn

Searching for Hoogsteen base pairs in protein-DNA complexes June, 2021 – March, 2022
Duke University - Dr. Hashim Al-Hashimi Durham, NC

- Analyzed suspicious DNA complexes with flagged base pairs, using Phenix and pyMOL
- Using Phenix, conducted multiple geometry manipulations to gauge the likelihood of a Hoogsteen being present
- Investigated potential consequences of Hoogsteen's when likely present in specific protein contexts

Screening novel inhibitors of P. Falciparum's apicoplast DNA polymerase June, 2018 – August, 2018
Iowa State University - Dr. Scott Nelson Ames, IA

- Worked to isolate, clone, express and purify DNA polymerase proteins
- Ran a variety of assay types primarily using fluorescence to measure DNA polymerase activity
- Learned a variety of classical biochemical research lab techniques

Research Presentations and Publications

G. Meng, J. Sumner, N. Brandt, A. T. Grigas, A. Córdoba, L. Regan, and C. S. O'Hern, "Assessment of scoring functions for computational models of protein-protein interfaces," submitted to **Protein Science** (2023).

Improving Non-bonded interactions in protein force fields through Machine Learning at the **Duke OUSF Enrichment Funding Annual Symposium** – Andres Cordoba, Weitao Yang (2023)

Using Biophysical Parameters to Predict Protein-Protein Docking at the **Leadership Alliance National Symposium** – Andres Cordoba, Jake Sumner, Corey O'Hern (2023)

Objects and Memorials as Variable Fixing Points in Memory at the **Duke Romance Studies Annual Undergraduate Research Symposium** – Andres Cordoba, Sarah Quesada (2023)

Expression, Purification and Activity of The K127W mutant of Plasmodium Falciparum Apicoplast DNA Polymerase compared to Wild-Type Polymerase at the **YES Concluding Symposium** – Andres Cordoba, Supreet Kaur, Scott Nelson (2018)

Duke in Oxford - selected attendee for study of Modern British Politics (2022)

TriMols Workshop and Career Panel – attendee

Awards & Honors

A.B. Duke Memorial Scholarship – Full Ride

Duke University

2020-2024

Dean's List and Dean's List with Distinction

Iowa State University and Duke University

2019, 2022, 2023

7th Place Nationally at *Protein Modeling* event analyzing AntiCRISPR's

Science Olympiad

2019

Specialized Skills

Programming Languages: Python (intermediate), Java (intermediate), GROMACS (intermediate), Phenix (intermediate), Pymol (intermediate) Website tools (HTML, CSS, etc.) (Proficient)

Foreign Language: Spanish (fluent)