

EDUCATION

Northern Arizona University- August 2019- August 2021
Master of Science in Biological Sciences

University of Texas at El Paso- August 2015- May 2019
Bachelor of Science in Biological Sciences-Biomedical Concentration

RESEARCH INTERESTS

- ❖ Degenerative and Chronic Disease
 - ❖ Infectious Diseases
 - ❖ Virus-associated disease
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RESEARCH EXPERIENCES

❖ **Mapping Health Disparities Utilizing Highly Multiplexed Serology, Northern Arizona University (August 2019-2021)**

- Master's thesis project under the guidance of Dr. Jason T. Ladner (NAU)
 - I. We utilized PepSeq technology to develop a sensitive, high-throughput assay for characterizing an individual's nearly complete history of viral exposures within a single reaction. We demonstrated the effectiveness of this approach for detecting health disparities through a pilot study in Phoenix, AZ where we recapitulated known seroprevalence rates of common viruses as well as health disparities between a Hispanic white (HW) and non-Hispanic white (NHW) sample population.
- **Techniques Learned:** NextGen sequencing, PepSeq, handling of human and non-human sera/plasma, qPCR, TapeStation, Bioanalyzer, custom Python scripts, command line analyses

❖ **Academic Year Mentored Research, University of Texas at El Paso (Fall 2017-May 2019)**

- Participated in academic year basic research, I led two projects under the guidance of Dr. Manuel Llano (UTEP).
 - I. **[This data was included in a manuscript in preparation.]** Generation of a cell line expressing a PARP1 mutant. Using site directed mutagenesis PCR, I generated a PARP1 mutant. I verified the identity of the mutant by DNA sequencing, generated a large amount of the plasmid expressing this mutant and stably expressed it in PARP1-knockout human CD4+ T cells. I verified the expression of the mutant protein in the cell line generated through

immunoblotting analysis. These cells were then used to define the effect of the mutation on the anti-HIV-1 PARP1 activity.

- II. **UNDERGRADUATE THESIS:** Constructing DNA plasmid and investigating location of PARP-1 in supT-1 cell clones and analysis of the chromatin-binding activity of PARP1 wild type and mutants. The goal of this project is to determine whether there is correlation between the anti-HIV-1 activity and the chromatin-binding activity of PARP1. To this end, I generated chromatin-bound and chromatin-non-bound fractions from cells expressing PARP1 wild type and mutants and evaluated their presence in these fractions by immunoblotting. Anti-HIV activity of these PARP1 proteins was previously defined by our lab.
- **Techniques Learned:** PCR-based mutagenesis. Gene cloning-including DNA ligation, transformation, DNA mini and maxi preps, restriction digest analysis of DNA, DNA sequencing and analysis, gel purification of DNA fragments, agarose gel electrophoresis. SDS-PAGE/immunoblotting. Tissue culture of adhering (HeLa and HEK 293T) and suspension (SupT1) cells. Cellular fractionation. Chromatin binding assay.
- ❖ **Summer Undergraduate Research Fellowship (SURF), University of Texas Southwestern Medical Center (Summer 2018).**
- Participated in a pediatric infectious disease lab validating a luciferase reporter assay as an alternative method for quantifying the internalization of *L. amazonensis* parasites under the supervision of Dr. Dawn M. Wetzel. (UT Southwestern Medical Center).
 - **Techniques Learned:** Parasite cell culture. Luciferase and Alamar Blue™ cell viability and EC₅₀ drug assays. Immunofluorescent imaging techniques.
- ❖ **UTHealth Innovation for Cancer Prevention Research Training Program Summer Fellowship (SPH CPRIT), University of Texas Health Center Houston- El Paso Regional Campus (Summer 2017).**
- Participated in an environmental health research lab to understand the concepts of solar irradiation of sewage coliforms and the potential use of solar irradiation in water retention ponds under the guidance of Dr. Roberto Rodriguez. (UT Health Houston).
 - **Techniques Learned:** Bacterial cell culture. Sewage coliform filtration. Quantification of bacterial colonies.
- ❖ **Undergraduate Research Opportunity Consortium (UROC), University of Arizona (Summer 2016).**
- Participated in a research lab designed to understand the concepts of dry powder inhalers including their physical and chemical properties, drug components, and aerosol dispersion performance under the guidance of Dr. Heidi M. Mansour (Pharmacy, U of A).
 - **Techniques Learned:** Epithelial cell culture including air-liquid interface. Formulating Dry Powder Inhalers (DPI). DPI devices. Next Generation Impactor™.

❖ **Stop That Bacteria! BUILD Research -Driven Course (RDC) (Fall 2015/Spring 2016).**

- Participated in a Research-Driven Course designed to understand the growth and immune response of the bacteria *F. tularansis* using an in vitro macrophage /NKT cell infection model under the guidance of Dr. Charles Spencer (Biology, UTEP).
- **Techniques Learned:** Bacterial and macrophage cell culture and infections. ELISA. Bacterial and macrophage cell labeling. EMax® Plus Microplate Reader and software- SoftMax®Pro.

PRESENTATIONS

Undergraduate Research Opportunity Consortium (UROC). University of Arizona. August 2016. Tucson, AZ. Symposia/Poster. “Improvement of *In Vitro* Aerosol Dispersion Performance by Using Mannitol in Dry Powder Inhaler Formulations” **Alejandra Piña**, Carissa L. Grijalva, Maria F. Acosta, Alexan I. Gomez, Priya Muralidharan, Don Hayes, Jr., MD., Jason X.-J. Yuan, MD., PhD., Stephen M. Black, PhD., and Heidi M. Mansour, PhD.

University of Texas at El Paso. September 2016. El Paso, TX. Poster. “Improvement of *In Vitro* Aerosol Dispersion Performance by Using Mannitol in Dry Powder Inhaler Formulations”, **Alejandra Piña**, Carissa L. Grijalva, Maria F. Acosta., Alexan I. Gomez, Priya Muralidharan, Don Hayes, Jr., MD., Jason X.-J, MD, Yuan PhD, Stephen M. Black, PhD., and Heidi M. Mansour, PhD.

American Association and Immunology. 2016. Seattle, WA. Poster. “NKT cell-mediated recognition and inhibition of inflammation” Montserrat Garcia Arreguin, Martha Miramontes, Nicole Setzu, Antonio Chaidez-Sandoval, Mireya Ramos, Leila Martinez, Andrea Arizpe, Gerardo Zavala, Ricardo Vela, **Alejandra Piña**, Claudia Becerra, Dominique Mata, Yessica Delgado, Carlos Navar, Luis Arroyo, Mario Garcia, Betsy Whitman, Joy Contreras, Vanessa Correa, Trevor Duarte, PhD. and Charles T. Spencer, PhD.

BUILDing SCHOLARS Symposium. University of Texas at El Paso. September 2017. El Paso, TX. Symposia/Poster. “Solar Inactivation of Filtered Raw Sewage Coliforms”, **Alejandra Piña**, Jonathan Moreno, Roberto Rodriguez, PhD.

Tri-Branch American Society of Microbiology Meeting 2018. Durango, CO. Symposia/Poster. “Mapping functional domains of Poly (ADP-ribose) Polymerase-1 implicated in HIV-1 replication.” **Alejandra Piña**, Christopher R. Farmer, Zachary Martinez PhD, Cosette Perez, Susana Sanchez, Manuel Llano PhD.

Campus Office of Undergraduate Research Initiatives. University of Texas at El Paso. El Paso, TX. Symposia/Poster. “Mapping functional domains of Poly (ADP-ribose) Polymerase-1 implicated in HIV-1 replication.” **Alejandra Piña**, Christopher R. Farmer, Zachary Martinez PhD, Cosette Perez, Susana Sanchez, Manuel Llano PhD.

Summer Undergraduate Research Fellowship (SURF). University of Texas Southwestern Medical Center. August 2018. Dallas, TX. Symposia/Poster. “Validating the luciferase reporter assay as an alternative method for quantifying parasite internalization in *L. amazonensis*” **Alejandra Piña**, Imran Ullah PhD, Dawn M. Wetzel MD/PhD.

BUILDing SCHOLARS Symposium. University of Texas at El Paso. September 2018. El Paso, TX. Symposia/Poster. “Validating the luciferase reporter assay as an alternative method for quantifying parasite internalization in *L. amazonensis*” **Alejandra Piña**, Imran Ullah, Dawn M. Wetzel MD/PhD.

HONORS, AWARDS, AND LEADERSHIP

- ❖ **4-year National Institutes of Health (NIH) BUILDing SCHOLARS Scholarship- (Fall 2015-Spring 2019)**
 - Full tuition scholarship with monthly stipend and associated activities to train for a career in biomedical research.
 - ❖ **Undergraduate Thesis (Fall 2018-2019)**
 - “Mapping functional domains in PARP-1”
 - ❖ **1st Place Undergraduate Research Poster Presenter at the TriBranch ASM Meeting 2018 (April 2018)**
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CERTIFICATES AND CREDENTIALS

- ❖ Collaborative Institutional Training Initiative (CITI) Trainings (2021)
 - ❖ Basic Biosafety Protection Course (PMI) (2021)
 - ❖ Bloodborne pathogens (2021)
 - ❖ City of Hope compliance training (2021)
 - ❖ Inclusion in the workplace (2019)
 - ❖ FERPA(2019)
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PROFESSIONAL DEVELOPMENT WORKSHOPS

- ❖ Crafting a Personal Statement (October 2017)
 - ❖ Responsible Conducts in Research (September 2017)
 - ❖ Preparing and Presenting Your Research Poster -(September 2016)
 - ❖ How to Present an Abstract -(September 2016)
 - ❖ Presentation Skills Workshop with Kathryn Kellner -(July 2016)
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TEACHING EXPERIENCE

- ❖ Microbiology Lab (Fall 2019-Fall 2020)
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SKILLS

- ❖ Bilingual
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RELEVANT COURSEWORK

- ❖ Practical Computing for Biologists
 - ❖ Statistics
 - ❖ Virology
 - ❖ Immunobiology
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REFERENCES

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