

Federico Valdez, PhD

Phone: (915) 637-3784

Email: fvaldez2988@gmail.com

Scientific Career Experience

Postdoctoral Research Assistant

April 2020-Present

Plum Island Animal Disease Research Center-USDA, Orient, NY

National Bio and Agro-Defense Facility-USDA, Manhattan, KS (Supervisors: Drs. Luis Rodriguez and Chad Mire)

Established several projects to investigate the ecology and molecular biology of Vesicular Stomatitis Virus, including:

- Genetic characterization by next-generation sequencing and phylogenetic analysis of outbreak strains.
- Elucidation of viral genetic determinants of virulence using reverse genetics and established animal models.
- Established an international project in Mexico for the surveillance of VSV in insect vectors from an endemic region.
- Established a larger surveillance project in three different regions of Mexico (southern, central and northern) to study the ecological factors affecting VSV epidemiology.

Postdoctoral Research Assistant

December 2018-April 2020

The University of Texas at El Paso, El Paso, Tx (Supervisor: Dr. Manuel Llano)

- Established and optimized numerous virology and molecular techniques for the quantification, detection and evaluation of flaviviruses in the lab, including western blot analysis, qPCR, flow cytometry, confocal microscopy.
- Established and optimized all SOPs for work with flaviviruses in the BSL-3, including:
 - Optimizing formulation of growth and maintenance media for all cell lines used in the BSL-3.
 - Optimization of viral titration by plaque assay using solid and semi-solid methods.
 - Develop SOP for the growth and maintenance of viral stocks.
 - Develop SOPs for the preparation of infected samples to be analyzed using confocal microscopy, flow cytometry and RNA purification.
- Led, trained, and directly worked with 9 undergraduate and 3 graduate students on their projects, including experimental design, day-to-day activities and data analysis.
- Mentored students on career prospects and evaluation of graduate school suitability, many of whom are now in top-class graduate programs.
- Manage the laboratory by supervising the students, maintaining stocks of supplies, facilitating lab meetings, resolving lab issues, and ensuring the laboratory is compliant with EH&S standards.

Graduate Student Research Assistant

Spring 2013-December 2018

The University of Texas at El Paso, El Paso, Tx (Supervisor: Dr. Manuel Llano)

- Characterized the role of the cellular restriction factor Schlafen 11 on West Nile, Dengue and Zika virus replication using diverse molecular biology and virology techniques.
- Generated stable knockdowns of Schlafen 11 on different cell lines and elucidated its effect on flavivirus replication using tissue culture, molecular biology and virology techniques.
- Designed and optimized a strand-specific RT-qPCR protocol for detection and quantitation of West Nile virus sense (+) and antisense (-) RNA.

- Trained, supervised and mentored undergraduate and graduate students on lab techniques and their own projects.
- Collaborated with fellow coworkers outside of main research project, resulting in another journal article publication.

Research Assistant

Fall 2010-Fall 2012

The University of Texas at El Paso, El Paso, Tx (Supervisor: Dr. Kristine Garza)

Studied the effects of high circulating levels of leptin found in obese patients and the mechanisms by which it promotes survival of tumors by protecting them against chemically- induced cell death

Summer Intern/Research Assistant

June-August 2010

Washington University School of Medicine, St. Louis, MO (Supervisor: Dr. Michael Lovett)

Investigated the relationship between p27 and microRNA-222 during the craniofacial development of chicken and duck embryos using mainly RT-PCR and Western Blot analysis

Research Assistant

Fall 2008-Spring 2010

The University of Texas at El Paso, El Paso, Tx (Supervisor: Dr. Eli Greenbaum)

Studied the phylogeography of Peruvian geckos by PCR analysis, DNA purification, DNA extraction from tissues, and DNA analysis for the use of creating phylogeny trees.

Trained and directed 4 new lab members, helping them develop techniques as well as providing guidance and advice in two projects that culminated in a scientific publication.

EDUCATION

The University of Texas at El Paso

December 2018

Ph.D. in Pathobiology

Title: "Characterization of the broad antiviral activity of Schlafen 11".

Advisor: Dr. Manuel Llano

The University of Texas at El Paso

December 2012

B. S. in Microbiology

AWARDS

Research Initiative for Scientific Enhancement (RISE) Fellowship

Four-year PhD stipend support funded by the NIH (Grant# R25GM069621-11), award secured independently.

Dr. Keelung Hong Graduate Student Fellowship

Privately funded two-year PhD stipend support, proposal written and award secured independently.

PUBLICATIONS

Valdez F, Velazquez-Salinas L, Zhou LH, Smoliga GR, Fish I, Navarro-Lopez R, Lopez-Gonzalez I, Hanley KA, Mire CE, Rodriguez LL, Arzt J.O. Near full-length genome sequence of a vesicular stomatitis New Jersey virus isolate collected from a naturally infected cow in the endemic state of Chiapas, Mexico. Microbiol Resour Announc0:e01007-24.<https://doi.org/10.1128/mra.01007-24>.

Zhou LH*, **Valdez F***, Lopez Gonzalez I, Freysser Urbina W, Ocaña A, Tapia C, Zambrano A, Hernandez Solis E, Peters DPC, Mire CE, Navarro R, Rodriguez LL, Hanley KA. Vesicular Stomatitis Virus Transmission Dynamics Within Its Endemic Range in Chiapas, Mexico. *Viruses*. 2024 Nov 6;16(11):1742. doi: 10.3390/v16111742. PMID: 39599856; PMCID: PMC11598859. (* these authors contributed equally to this work).

Velazquez-Salinas L, Medina GN, **Valdez F**, Zarate S, Collinson S, Zhu JJ, Rodriguez LL. Exploring the Molecular Basis of Vesicular Stomatitis Virus Pathogenesis in Swine: Insights from Expression Profiling of Primary Macrophages Infected with M51R Mutant Virus. *Pathogens*. 2023 Jun 30;12(7):896. doi: 10.3390/pathogens12070896. PMID: 37513744; PMCID: PMC10384765.

Young KI*, **Valdez F***, Vaquera C, Campos C, Zhou L, Vessels HK, Moulton JK, Drolet BS, Roza-Lopez P, Pelzel-McCluskey AM, Peters DC, Rodriguez LL, Hanley KA. Surveillance along the Rio Grande during the 2020 Vesicular Stomatitis Outbreak Reveals Spatio-Temporal Dynamics of and Viral RNA Detection in Black Flies. *Pathogens*. 2021 Oct 1;10(10):1264. doi: 10.3390/pathogens10101264. PMID: 34684213; PMCID: PMC8541391. (* these authors contributed equally to this work).

Valdez, F., Salvador, J., Palermo, P., Mohl, J.E., Hanley, K.A., Watts, J., Llano, M. Schlafen 11 Restricts Flavivirus Replication. *J Virol* 93: e00104-19. <https://doi.org/10.1128/JVI.00104-19>.

Castro, E., Martinez, Z., Seong, C.S., Cabrera-Espinoza, A., Ruiz, M., Hernandez Garcia, A., **Valdez, F.**, Llano, M., Echegoyen, L. Characterization of new cationic N,N -dimethyl[70]fulleropyrrolidinium iodide derivatives as potent HIV-1 maturation inhibitors. *J. Med. Chem. acs.jmedchem.6b00994* (2016). doi:10.1021/acs.jmedchem.6b00994.

Greenbaum, E., Sinsch, U., Lehr, E., **Valdez, F.**, Kusamba, C. (2013). Phylogeography of the reed frog *Hyperolius castaneus* (Anura: Hyperoliidae) from the Albertine Rift of Central Africa: Implications for taxonomy, biogeography and conservation. *Zootaxa*, 3731(4), 473–494.

TECHNICAL SKILLS

Cell biology:

- Extensive experience in mammalian cell culture – aseptic technique, cell culturing/maintenance/freezing.
- Generation of modified cell lines using shRNAs/siRNAs, transduction with lentiviral vectors, chemical/liposome-based transfections (calcium phosphate, polyethylenimine [PEI], lipofectamine).
- Experience with primary macrophage isolation from pigs.

Cell-based assays:

- Colorimetric cell viability assays (MTT), luciferase/GFP reporters, single-round virus infections, tritiated thymidine proliferation assay. Flow cytometry analysis of cell cycle/apoptosis.
- Fluorescence and confocal microscopy.

Molecular biology:

- Nucleic acid extraction and purification from mammalian cells, tissues (frozen & paraffin embedded) and *in vivo* clinical samples (swabs, serum, blood) using Trizol or column-based methods (RNAeasy Mini kit, PureLink RNA Mini kit) as well as high-throughput extractions with MagMax Viral RNA and KingFisher Flex system. Gene expression analysis by quantitative real-time PCR (qRT-PCR) and DNA microarray.
 - Design and optimization of TaqMan qRT-PCRs.
 - Including the development of a strand-specific qPCR for detection and quantitation of West Nile virus RNA.
- Extensive experience with next-generation sequencing (RNA isolation, cDNA synthesis and library preparation) and sequencing on Illumina platform (NextSeq 500 and 550).
- Molecular Cloning
 - Plasmid preparation, ligation, transformation

- End-point PCR and gel electrophoresis
 - Restriction enzyme digestion
 - Site-directed mutagenesis
 - Sequencing analysis
- Extensive experience in western blot analysis, immunoprecipitation, ELISA.

Virology:

- Extensive experience with virus neutralization test, plaque reduction neutralization test.
- Extensive experience with virus titration by plaque assay (solid and semi-solid) and TCID₅₀.
- +10 years of experience working in BSL2 and BSL3 laboratories.

***In vivo* techniques and field experience:**

- Extensive experience in the handling of animal models (mice, pigs), virus inoculation, sample collection and processing.
- Extensive experience coordinating with international collaborators to perform study site selection, insect collections (CDC miniature light traps baited with dry ice) and cattle serum collections for disease serosurveillance.

Software Skills:

Photoshop, Illustrator, Word, Excel, PowerPoint, BioEdit, MEGA, GraphPad, ImageJ, SnapGene, Geneious, CLC genomics workbench.

CONFERENCES ATTENDED & POSTER PRESENTATIONS

USDA-ARS Grand Challenge Project: Vesicular Stomatitis as a Model for Predictive Disease Ecology

Semi-annual meeting held between collaborators within USDA and New Mexico State University to present preliminary and in-progress data, coordinate manuscript preparation and discuss future project directions.

Las Cruces, NM	October 2024
Fort Collins, CO	May 2024
Manhattan, KS	October 2023
Plum Island Animal Disease Center, Plum Island, NY	April 2023
Virtual Meeting	January 2023
Virtual Meeting	June 2022

Keystone Symposia on Positive-Strand RNA Viruses	Summer 2016
Austin, TX	

UTEP Symposium on Infectious Diseases and Health Disparities	Fall 2015
El Paso, TX	

Immunity, Inflammation and Cancer Conference	Fall 2010
Bethesda, MD	

Annual Biomedical Research Conference for Minority Students	Fall 2010
Charlotte, NC	

UTEP Symposium on Infectious Diseases and Health Disparities**Fall 2015****Determining the role of Slfn11 during flavivirus replication**

Federico Valdez, Pedro Palermo, Douglas Watts, Manuel Llano.

The University of Texas at El Paso, Department of Biological Sciences

Annual Biomedical Research Conference for Minority Students (ABRCMS)**Fall 2010****Leptin protects human breast cancer cell lines from cytotoxic agents**

Federico Valdez, Yadira Arellano, and Kristine M. Garza.

The University of Texas at El Paso, Department of Biological Sciences.

National Conference for Herpetologists and Ichthyologists**Summer 2010****Phylogeography of Peruvian Geckos in the Phyllodactylus microphyllus Group**

Federico Valdez, Eli Greenbaum, Tony Gamble and Aaron Bauer.

The University of Texas at El Paso, Department of Biological Sciences.

Relationship Between p27 and miR-222 During Craniofacial Development**Summer 2010**

Federico Valdez, Kara Powder, and Michael Lovett.

Washington University in St. Louis, Department of Genetics.

VOLUNTEER EXPERIENCE**Poster Judging**

Young Women's STEAM Research & Preparatory Academy Science Fair

Spring 2017

Burnham Wood Charter School Science Fair

Spring 2018

Jose H. Damian Elementary School Science Fair

Spring 2018**Mexican Red Cross****Spring 2007**

Served as a phone operator for the red cross and helped collect food, clothes, and toys for the underprivileged population of Juarez, Mexico.

LANGUAGES

Spanish (native) and English (fluent).