***Roberto M. Aguilar, Ph. D.***

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# EDUCATION

## 2006 PH. D., Biology

University of Texas at San Antonio (UTSA)

Department of Biology

Graduate Advisor: Luis S. Haro, Ph. D.

Dissertation: Characterization of growth hormone receptors in a neuronal cell line of rat hippocampal origin (H19-7): A model for determining the biological action of growth hormone in neuronal cells

1997 ***B. S., Biology***

University of Texas at San Antonio

Department of Biology

Undergraduate Advisor: Luis S. Haro, Ph. D.

Undergraduate Research: Purification and Characterization of novel growth hormone and prolactin isoforms from human pituitary extracts.

# TEACHING

Summer II 2019 Anatomy and Physiology I (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Spring 2019 Anatomy and Physiology I (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Spring 2019 Biology II for non-majors (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Fall 2018 Anatomy and Physiology I (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Spring 2018 Introduction to Anatomy and Physiology (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Fall 2017 Anatomy and Physiology I (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Spring 2017 Introduction to Anatomy and Physiology (lecture and lab)

Lone Star College Cy-Fair, Houston, TX

Fall 2012 Cellular Biology

Texas A&M University San Antonio, SA, TX

Fall 2012 Anatomy & Physiology I (Lab)

University of the Incarnate Word, SA, TX

Spring 2012 Cell & Molecular Methods (Lab)

St. Mary’s University, SA, TX

Spring 2012 Medical Terminology

St. Mary’s University, SA, TX

Spring 2012 Biology; Unity of Life (Lecture and Lab)

University of the Incarnate Word, SA, TX

Spring 2012 Anatomy and Physiology I (Lecture and Lab)

University of the Incarnate Word, SA, TX

Spring 2012 Anatomy and Physiology II (Lecture and Lab)

University of the Incarnate Word, SA, TX

Fall 2011 Cell & Molecular Methods (Lab)

St. Mary’s University, SA, TX

Fall 2011 Biology (Lab)

St. Mary’s University, SA, TX

Fall 2011 Biology; Unity of Life (Lecture and Lab)

University of the Incarnate Word, SA, TX

Fall 2011 Anatomy and Physiology I (Lab)

University of the Incarnate Word, SA, TX

Fall 2011 Biology (Lecture and Lab)

Northwest Vista College, SA, TX

Fall 2011 Anatomy and Physiology II (Lecture and Lab)

Northwest Vista College, SA, TX

Summer 2011 Anatomy and Physiology I (Lecture and Lab)

Northwest Vista College, SA, TX

Spring 2000 Cell Biology (Lab), UTSA, SA, TX

Spring 1999 Biochemistry (Lab), UTSA, SA, TX

# RESEARCH & WORK EXPERIENCE

## 2017-present Adjunct Faculty, Biology Department, Houston, TX

Lone Star College Cy-Fair; Teaching

* Anatomy and Physiology
* Biology

## 2018 Independent Laboratory Consultant (Texas)

* New lab test set up
* Test cost analysis
* Logistical analysis
* Ergonomics assessment
* New equipment acquisition and set up
* CAP/CLIA assessment

## 2012-2018 Scientist and Laboratory Supervisor

## Houston Metro Urology (HMU), Houston, TX

* Serve as a Scientific Liaison to all the 25 Urologist in the practice found throughout 12 different sites in the Houston area
* Serve as a Scientific Liaison to the HMU Clinical Studies Department
* Supervise and Manage a 4-department laboratory (Chemistry, Microbiology, Pathology, and FISH)
* Establish an In-House Bladder FISH test for Bladder Cancer
* Perform and oversee all clinical/anatomic pathology screening for urological cancers including prostate and bladder cancer.
	+ Tissue processing (fixing, embedding, cutting, staining)
	+ H&E Staining (Leica Autostainer and Coverslipper)
	+ Cytology processing (Hologic ThinPrep)
	+ PIN-4 Immunostaining (Biocare Manual Kinetic Stainer)
	+ Bladder FISH testing (Abbott’s Urovysion and Cellay Bladder FISH probes)
	+ PSA immunodetection (Abbott Architect I-1000)
	+ Testosterone immunodetection (Abbott Architect I-1000)
	+ Urine culture (ID and susceptibility testing; Biomerieux VITEK-2)
* Manage all proficiency testing
* Maintain CAP/CLIA requirements
* Pass CAP/CLIA inspections

## 2011-2012 Adjunct Faculty, San Antonio, TX

* St. Mary’s University
* University of the Incarnate Word
* Texas A&M University in San Antonio
* Northwest Vista College

## 8/10-5/11 Postdoctoral Fellow

**Research Focus: Amino acid transport in the human placenta.**

## UT Health Science Center San Antonio, San Antonio, TX

Department of Obstetrics and Gynecology

Center for Pregnancy and Newborn Research

Principal Investigator/Mentor: Dr. Theresa Powell

## 5/6-8/10 Postdoctoral Fellow

**Research Focus: Neural regeneration using models of spinal cord injury.**

## University of California, Irvine, Irvine, CA

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center

Principal Investigator/Mentor: Dr. Oswald Steward

1997-2006 **Graduate Student Researcher**

**Research Focus: Characterization of growth hormone receptors in rat hippocampal cells.**

University of Texas at San Antonio, San Antonio, TX

Department of Biology

Principal Investigator/Mentor: Dr. Luis S. Haro

1995-1997 **Undergraduate Student Researcher**

**Research Focus: Isolation and characterization of novel human growth hormone and prolactin variants from human pituitary glands.**

University of Texas at San Antonio, San Antonio, TX

Department of Biology

Principal Investigator/Mentor: Dr. Luis S. Haro

# FUNDING AND FELLOWSHIPS

## 2007-2009 University of California President’s Postdoctoral Fellowship

Funding source: University of California Office of the President University of California, Irvine

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center

## 2006-2007 National Institutes of Health’s Postdoctoral Fellowship

Funding source: NIH/NINDS Training Grant on Neural Regeneration; PI-Dr. Oswald Steward (5T32NS007486-05) University of California, Irvine

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center

2004-2005 **Alfred P. Sloan Foundation Predoctoral Scholarship**

University of Texas at San Antonio

Department of Biology

* 1. **Minority Biomedical Research Support (MBRS) Fellowship**

Graduate Student

University of Texas at San Antonio

Department of Biology

1997 **Minority Biomedical Research Support (MBRS) Fellowship**

Undergraduate Student

University of Texas at San Antonio

Department of Biology

1996-1997 **Pfizer** **Undergraduate Research Fellowship**

Undergraduate Research

University of Texas at San Antonio

Department of Biology

# PUBLICATIONS (MANUSCRIPTS)

1. **Aguilar, R. M.**, Bustamante, J. J., Hernandez, P., Martinez, A. O., and Haro, L. S. 1999. Precipitation of dilute chromatographic samples (ng/ml) containing interfering substances for SDS-PAGE. *Analytical Biochemistry* **267** (2): 344-350.
2. Haro, L. S., Bustamante, J. J., Hernandez, P., Flores, R., **Aguilar, R. M.**, Lopez-Guajardo, C., and Martinez, A. O. 1999. Biochemistry and pharmacology of rabbit cardiac growth hormone (GH) receptors. *Molecular and Cellular Endocrinology* **152**: 179-187.
3. Sanchez, D. J. Armstrong, L., **Aguilar, R.**, Adrian, G. S., Haro, L., and Martinez, A. O. 2001. Haptoglobin gene expression in human glioblastoma cell lines. *Neuroscience Letters* **303**: 181-184.
4. Bustamante, J. J., Garcia, M., Gonzalez, L., Garcia, J., Flores, R., **Aguilar, R. M.**, Trevino, A., Martinez, A. O., and Haro, L. S. 2005. Separation of proteins with a molecular weight difference of 2 kDa utilizing preparative double-inverted gradient polyacrylamide gel electrophoresis under non-reducing condition: Application to the isolation of 24 kilodalton human growth hormone. *Electrophoresis* **26** (23): 4389-4395.
5. Grigorian, A. L., Bustamante, J. J., Munoz, J., **Aguilar, R. M.,** Martinez, A. O., and Haro, L. S. 2007. Preparative alkaline urea gradient PAGE: Application to purification of extraordinarily-stable disulfide-liked homodimer of human growth hormone. *Electrophoresis* **28** (21): 3829-3836.
6. **Aguilar, R. M.**, Talamanates, F., Bustamante, J. J., Munoz, J., Trevino, L. R., Martinez, A. O., and Haro, L. S. 2009. MAP dendrimer elicits antibodies for detecting rat and mouse GH-binding proteins.  *Journal of Peptide Science* **15** (2): 78-88*.*
7. Bustamante, J. J., Gonzalez, L., Carroll, C. A., Weintraub, S., **Aguilar, R. M.**, Munoz, J., Martinez, A. O., and Haro, L. S. 2009. O-glycosylated 24-kDa human growth hormone (hGH) has a mucin-like biantennary disialytated core 1 tetrasaccharide attached at Thr-60. *Proteomics* **9**: 1-15*.*
8. **Aguilar, R. M.** and Steward, O. 2010. A bilateral cervical contusion injury model in mice: Assessment of gripping strength as a measure of forelimb motor function.  *Experimental Neurology*, **221**: 38-53*.*
9. Bustamante, J. J., Grigorian, A. L., Munoz, J., **Aguilar, R. M.,** Trevino, L. R., Martinez, A. O., and Haro, L. S. 2010. Human growth hormone: 45 kDa isoform with extraordinarily stable interchain disulfide links has attenuated receptor-binding and cell-proliferative activities. *Growth Hormone & IGF Research,* **20**: 298-304*.*
10. Blackmore, D. G., Reynolds, B. A., Golmahammadi, M. G., Large, B., **Aguilar, R. M.,** Haro, L., Waters, M. J., Rietze, R. L. 2012. Growth hormone responsive neural precursor cells reside within the adult mammalian brain. *Scientific Reports,* **2**: 250*.*
11. Sharp, K. G., Matsudaira, Y., Stiles, T. L., **Aguilar, R. M.** and Steward, O. 2013. A re-assessment of the effects of treatment with a non-steroidal anti-inflammatory (ibuprofen) on axon regeneration via RhoA inhibition after spinal cord injury. *Experimental Neurology,* **In Press***.*

# CLINICAL/ANATOMIC PATHOLOGY SKILLS AND CERTIFICATIONS

* Molecular Biologist (MB-ASCP; 2018-2021)
* 6 years of laboratory management experience
* 6 years of laboratory supervision experience
* 6 years of immunoanalyzer experience (Abbott Architect I-1000)
* 6 years of Bladder FISH clinical testing (Urovysion and Cellay probes)
* 6 years of anatomic pathology immunostaining supervision (PIN-4, ect)

# ACADEMIC AND RESEARCH SKILLS

* Anatomy & Physiology, Molecular Biology, Endocrinology, Neuroscience
* Excellent social and verbal skills
* Small Animal Surgery (mice/rats/rabbits)
* Expert in spinal and brain surgeries
* Animal handling (mice, rats, and rabbits)
* Genetically engineered mouse colony maintenance
* SDS-PAGE (1D, 2D, native, and reduced)
* Immunodetection (Western Blots and immunoprecipitations)
* Confocal Microscopy (1, 2, and 3 dyes/fluorophores)
* Antibody Production & Characterization (conventional and MAPS)
* Molecular Biology Techniques (Cell Culture, RT-PCR, RIA/RRA, Radioactive Protein Labeling, Protein Purification/Characterization, HPLC/FPLC Chromatography.

# HONORS AND AWARDS

## Fall 2018 Adjunct Faculty Excellence Award Nominee

## Biology Department, Lone Star College Cy-Fair

## Fall 2017 Adjunct Faculty Excellence Award Nominee

## Biology Department, Lone Star College Cy-Fair

## 2013 BRAINS Fellow

## Broadening the Representation of Academic Investigators in Neuroscience (BRAINS)

 University of Washington

## 2007-2009 President’s Postdoctoral Fellow

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center; University of California, Irvine

## 2006-2007 NIH Postdoctoral Fellow

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center; University of California, Irvine

2006 **South Texas Initiative for Mental Health Research Scholar**

Department of Biology; University of Texas at San Antonio

2004-2005 **Alfred P. Sloan Foundation Predoctoral Scholar**

Department of Biology; University of Texas at San Antonio

2004 **Course Scholarship Recipient**

Optical microscopy in the biomedical sciences

Department of Cellular and Structural Biology;

University of Texas Health Science Center San Antonio and

Department of Biology; University of Texas at San Antonio

* 1. **Graduate MBRS Fellow**

Department of Biology; University of Texas at San Antonio

2002 **SACNAS-Neuroscience Scholar**

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)

1999-2001 **Hispanic Scholarship Fund Scholar**

University of Texas at San Antonio

Academic Years: 1998-1999; 1999-2000; and 2000-2001.

1999 **Excellence in Endocrinology Scholar**

1999 SACNAS Annual Conference

1997 **Undergraduate MBRS Fellow**

Department of Biology; University of Texas at San Antonio

1997 **Student Honors Convocation**

Department of Biology; University of Texas at San Antonio

1996-present Numerous **Travel Awards** to attend national conferences

# COMMITTEES

2006-2010 SACNAS Postdoc Committee

2006-2010 Advisory Council on Diversity Issues, Office of Graduate Studies, University of California, Irvine

2002-2010 SACNAS Membership Committee

2002-2004 SACNAS Board of Directors--Graduate Student Representative

2002-2004 SACNAS Student Poster Judging Committee

2002-2004 SACNAS Special Interests Group Committee

2001-2002 Biology Ph. D. Students (BIPS)—President, University of Texas at San Antonio.

2001-2002 MBRS Committee on Grievance and Appeals, Division of Biology, University of Texas at San Antonio.

2000-2001 Biology Ph. D. Students (BIPS)—Public Relations, University of Texas at San Antonio.

2000-2001 MBRS Student Selection Committee, Division of Biology, University of Texas at San Antonio.

# INVITED SPEAKER

“**Neural regeneration in mouse models of spinal cord injury”**

MBRS seminar series, University of Texas at El Paso, January 22, 2010.

**“Axonal regeneration and behavioral recovery in mouse models of spinal cord injury”**

MBRS seminar series, University of Texas at San Antonio, October 23, 2009.

**“Endocrinology in the spinal cord”**

Research in Endocrinology Symposia**,** 2006 SACNAS Annual Conference**,** Tampa, FL.

**“How to start a SACNAS chapter ”**

Special Interest sessions**,** 2003 SACNAS Annual Conference**,** Albuquerque, NM.

**“Research: A labyrinth in the brain”**, Bridges Summer Program seminar series, University of Texas at San Antonio, July 18, 2003.

**“Growth hormone receptors in the brain”**

MBRS seminar series, California State University at Dominguez-Hills, October 17, 2002.

**“Balancing home, work, culture, and science”**

2002 SACNAS Annual Conference, Anaheim, CA.

# SERVICE AND MENTORING

***Undergraduate Student Mentor***

Georgiana Margarit, Ryan Uyan, Michael Gonzales, Lawrence Tseng and Vanessa Lopez. University of California, Irvine.

***Diversity in STEM panel speaker***

2009 University of California, Irvine.

***Postdoc gathering room, session co-chair***

2006 SACNAS Annual Conference, Tampa, FL.

***Graduate student and postdoc reception, session co-chair***

2006 SACNAS Annual Conference, Tampa, FL.

***Undergraduate student orientation, session co-chair***

2005 SACNAS Annual Conference, Denver, CO.

***Graduate student orientation, session co-chair***

2003 SACNAS Annual Conference, Albuquerque, NM.

***“How to start a SACNAS chapter ”, session chair***

Special Interest sessions, 2003 SACNAS Annual Conference, Albuquerque, NM.

***Graduate student orientation, session chair***

2002 SACNAS Annual Conference, Anaheim, CA.

***Graduate student orientation, session chair***

2001 SACNAS Annual Conference, Anaheim, CA.

***“The brainy scientist”***

Brain presenter, Career Day, April 2003, Irving Middle School, San Antonio, TX.

***“Research in the brain”***

Brain presenter, Career Day, April 2002, Irving Middle School, San Antonio, TX.

***Science Fair Poster Judge***

DeZavala and Crockett Elementary Schools, April 2002, San Antonio, TX.

***Science Fair Poster Judge***

Fortress Christian Academy, February 2002, San Antonio, TX

***“Brain and science”***

Brain presenter to 3rd and 4th graders, Crockett Elementary, May 2001, San Antonio, TX.

***Brain Awareness Week***

Brain presenter, Whitey Museum, March 2001, San Antonio, TX.

***Brain Awareness Week***

Brain presenter, Incarnate Word University, March 2000, San Antonio, TX.

# PROFESSIONAL AFFILIATIONS

* Society for Neuroscience
* Society for the Advancement of Chicanos and Native Americans in Science
* Endocrine Society

# PROFESSIONAL REFERENCES

**Relationship: Mentor (1995-2006)**

**Luis S. Haro, Ph. D**.

Professor, Cell and Molecular Biology

Division of Biology

The University of Texas at San Antonio

One UTSA Circle

San Antonio, TX 78249-0662

(210) 458-5484 (Office; Science Bldg. 4.02.30)

(210) 458-5658 (Fax)

luis.haro@utsa.edu

**Relationship: Mentor (2006-2010)**

**Oswald Steward, Ph. D.**

Professor, Anatomy & Neurobiology and Neurobiology & Behavior

Director, Reeve Irvine Research Center

University of California, Irvine

1105 Gillespie Neuroscience Research Facility

Irvine, CA 92697

(949) 824-8908 (Office)

(949) 824-2625 (Fax)

osteward@uci.edu

**Relationship: Colleague (1995-present)**

**Juan J. Bustamante, Ph. D.**

Assistant Professor, Pharmaceutical Sciences

Irma Lerma Rangel College of Pharmacy

Texas A&M Health Science Center

MSC 131, 1010 West Avenue B

Kingsville, Texas 78363

(361) 593-4495

bustamante@pharmacy.tamhsc.edu

 **Relationship: Manager (2012-2018)**

**Mr. Greg Muhs**

Houston Metro Urology

Houston TX 77027

(832)-444-8602

greg.muhs@hmutx.com

**Relationship: Colleague and**

**Clinical Consultant (2000-present)**

**Rosa E. Villanueva, Ph. D.**

Southwest Consulting

San Antonio TX

(210) 912-9905

revillanueva@yahoo.com

# DETAILED RESEARCH PARTICIPATION

**Postdoctoral Research**

**Research Focus: Amino acid transport in the human placenta.**

## UT Health Science Center San Antonio, San Antonio, TX

Department of Obstetrics and Gynecology

Center for Pregnancy and Newborn Research

Principal Investigator/Mentor: Dr. Theresa Powell

* Collected human placentas upon delivery for cytosolic and microsomal membrane preparations for downstream analysis.
* Designed and performed assays for amino acid uptake using human placental microsomal membrane extractions.
* Designed and performed assays for amino acid uptake using trophoblast in culture isolated from freshly collected human placentas.
* Designed and performed Western blot analysis detecting the utilization of the mTOR signaling pathways from baboon placental extracts.

## Postdoctoral Research

**Research Focus: Neural regeneration using models of spinal cord injury.**

## University of California, Irvine, Irvine, CA

Department of Anatomy and Neurobiology

Reeve-Irvine Research Center

Principal Investigator/Mentor: Dr. Oswald Steward

* Performed animal husbandry maintaining colonies of Phosphodiester (PDE 7, PDE 8; PDE9) knockout mice.
* Maintained proper crossbreeding of all knockout colonies.
* Designed and develop proper DNA/RNA isolation protocols for downstream assessment of proper genotyping of all knockout colonies.
* Designed PCR protocols for determining of proper genotype of all PDE knockout colonies.
* Developed novel assessment of gripping strength for use in mice crucial for assessment of upper body ability prior and after a spinal cord injury.
* Designed proper behavioral analysis for assessing motor movement rehabilitation in mice pre/post spinal cord injury
* Developed a new scale of pectoral barbering in mice post spinal cord injury.
* Developed a new cervical contusion model in mice at the fifth cervical vertebral level.
* Perfused animal models and harvested tissue for use in molecular analysis and detection of axonal regeneration.
* Designed procedures for microscopy and image analysis for the quantitation of BDA-labeled axons in the corticospinal tract in spinal cords of injured mice.
* Served as a competent neurosurgeon for mouse/rat cervical and thoracic surgeries
* Served as a team member of important surgical collaboration across various institutions.
* Participated in hypothesis driven conceptual design of research direction including grant writing
* Designed and presented platform and poster presentations in numerous neuroscience based societies

**Graduate Student Researcher**

**Research Focus: Characterization of growth hormone receptors in rat hippocampal cells.**

University of Texas at San Antonio, San Antonio, TX

Department of Biology

Principal Investigator/Mentor: Dr. Luis S. Haro

* Designed, developed, produced and characterized polyclonal antibodies specific for the mouse/rat growth hormone binding protein using the multiple antigen peptide (MAPS) system.
* Optimized and performed western blot analysis for various hormones and hormone receptors using commercially available antibodies or antibodies produced and characterized in our laboratory.
* Designed isolation and purification methods for various isoforms of growth hormone and prolactin hormones that included high-performance liquid chromatography (HPLC), sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), isoelectric focusing (IEF-PAGE) and gradient gel SDS-PAGE.
* Developed cell culture models for the assessment of biological actions of newly isolated isoforms of growth hormone and prolactin hormones.
* Collected bovine livers for cytosolic and microsomal membrane preparations for downstream analysis.
* Designed radioimmuno assays (RIA) for the assessment of biological actions of newly isolated isoforms of growth hormone and prolactin hormones.
* Designed enzyme-linked immunosorbent assays (ELISAs) for the assessment of the presence of newly isolated isoforms of growth hormone and prolactin hormones.
* Designed radioreceptor assays (RRA) for the assessment of binding newly isolated isoforms of growth hormone and prolactin hormones to their respective receptors.
* Developed cell culture models for analyzing the apoptotic or growth effects of growth hormone and prolactin hormones on breast cancer cell lines.
* Utilized confocal microscopy to detect growth hormone receptors in a rat hippocampal cell line.
* Developed cell culture models for analyzing the growth and differentiation effects of growth hormone in a rat hippocampal cell line.
* Developed a precipitation technique for dilute substances in preparation for SDS-PAGE analysis.
* Participated in hypothesis driven conceptual design of research direction including grant writing
* Designed and presented platform and poster presentations

**Undergraduate Student Researcher**

**Research Focus: Isolation and characterization of novel human growth hormone and prolactin variants from human pituitary glands.**

University of Texas at San Antonio, San Antonio, TX

Department of Biology

Principal Investigator/Mentor: Dr. Luis S. Haro

* Aided in the isolation and purification of various isoforms of growth hormone and prolactin hormones that included high-performance liquid chromatography (HPLC), sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), isoelectric focusing (IEF-PAGE) and gradient gel SDS-PAGE.