

APPLICANT BIOGRAPHICAL SKETCH

NAME OF APPLICANT: Rolando Garza

eRA COMMONS USER NAME: ROLANDOGARZA

POSITION TITLE: Medical Scientist Training Program (MSTP) Fellow

EDUCATION/TRAINING: University of Texas Health San Antonio

INSTITUTION AND LOCATION	DEGREE (if applicable)	START DATE MM/YYYY	END DATE (or expected end date) MM/YYYY	FIELD OF STUDY
University of Texas at San Antonio	B.S. (Magna Cum Laude)	08/2013	12/2016	Microbiology & Immunology
University of Pennsylvania	Post-baccalaureate	01/2017	06/2019	Neuroscience & Neurovirology
University of Texas Health San Antonio	M.D.	06/2019	05/2027	Medicine
University of Texas Health San Antonio	Ph.D.	06/2019	05/2027	Microbiology, Immunology, & Molecular Genetics

A. Personal Statement

My long-term goals are to become a physician-scientist with an independent research program focused on identifying and defining novel mechanisms of antibody-mediated immunity and autoimmunity in human disease states. My ultimate goal is to drive the development of effective immunological strategies against infectious and neurodegenerative diseases and to care for populations with these conditions. My training in the STX-MSTP, along with my undergraduate and post-baccalaureate research training have expanded my knowledge and nurtured my enthusiasm for developing this career. I have pursued complementary research projects in immunology, neuroinflammation, neurovirology, and neurodegeneration and these experiences resulted in multiple national/ international conference presentations and publications in scientific journals. I plan to continue expanding my scientific network, attending scientific/ medical conferences, and working on my scientific/ grant writing during my M.D. and Ph.D training.

As a member of the STX-MSTP, I plan on focusing my studies in microbiology and immunology, particularly in antibody-mediated immunity and autoimmunity in multiple disease states. I plan to supplement my research time with shadowing/ clinical service in the department of neurology and emergency medicine at UT Health San Antonio.

B. Positions and Honors

ACTIVITY/ OCCUPATION	START DATE (mm/yy)	ENDING DATE (mm/yy)	FIELD	INSTITUTION/ COMPANY	SUPERVISOR/ EMPLOYER
MARC-U*STAR Undergraduate Research Fellow	06/14	05/16	Neuroimmunology	University of Texas at San Antonio	Dr. Astrid E. Cardona

ACTIVITY/ OCCUPATION	START DATE (mm/yy)	ENDING DATE (mm/yy)	FIELD	INSTITUTION/ COMPANY	SUPERVISOR/ EMPLOYER
Summer Undergraduate Research Fellow	06/15	08/15	Cell & Molecular Biology	University of Pennsylvania	Dr. Youhai Chen
Summer Undergraduate Research Fellow	06/16	08/16	Neuroscience	University of Pennsylvania	Dr. Dennis L. Kolson
WSRTP Undergraduate Research Fellow	09/16	12/16	Neuroimmunology	University of Texas at San Antonio	Dr. Astrid E. Cardona
Post-baccalaureate Research Education Program (PREP) Research Fellow	01/17	07/19	Neuroscience & Neurovirology	University of Pennsylvania	Dr. Dennis L. Kolson
Medical Scientist Training Program (MSTP) Fellow	06/2019	05/2027	Medicine & Immunology	University of Texas Health San Antonio	Dr. Jose Cavazos

Academic and Professional Honors

George W. Brackenridge Endowed M.D./Ph.D. Scholar - 2020

American Physician Scientist Association (APSA) Southwestern Regional Meeting - Best Poster Presentation - 2019

Annual Biomedical Research Conference for Minority Students (ABRCMS) – Best Presentation in Neuroscience -2018

Conference for Retroviruses and Opportunistic Infections Young Investigator Travel Scholarship – 2018

Annual Biomedical Research Conference for Minority Students (ABRCMS) Travel Award Recipient – 2016

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) National Conference Travel Award Recipient -2016

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) National Conference – Best Presentation in Immunology -2015

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) National Conference Travel Award Recipient -2015

Memberships in Professional Societies

American Physician Scientist Association (APSA)

American Academy of Neurology (AAN)

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

C. Contributions to Science

1) I joined the lab of Dr. Astrid E. Cardona at the University of Texas at San Antonio for two and one-half years as a MARC-U*STAR and Work Study Research Training Program Fellow. My research focus was the role for microglial activation in the early stages of pathogenesis of diabetic retinopathy. We determined that fractalkine signaling in the diabetic retina controls microglial activation and that deficient fractalkine signaling leads to retinal neurodegeneration in diabetic mice. This study resulted in a second-author publication and six abstracts for me (three as first author).

Research papers

Mendiola AS, **Garza R**, Cardona SM, Mythen SA, Lira SA, Akassaglou K, Cardon AE. (2017). Fractalkine signaling attenuates perivascular clustering of microglia and fibrinogen leakage during systemic inflammation in mouse models of diabetic retinopathy. *Front Cell Neurosci.* 2017 Jan 10;10:303. doi: 10.3389/fncel.2016.00303. eCollection 2016

Abstracts

Garza R., Mendiola AS., Cardona SM., and Cardona AE. -- Fractalkine signaling inhibits microglial activation and neuronal cell loss in the cortex following systemic inflammation in a diabetic mouse model UTSA COS Research Conference 2016, **Poster** presentation

Mendiola AS., **Garza R.**, Cardona SM., and Cardona AE. - Fractalkine signaling during systemic endotoxemia inhibits perivascular microglial lesion formation in the diabetic retina ASN Neuro 2016, **Poster** presentation by Mendiola AS

Mendiola AS., **Garza R.**, Cardona SM., and Cardona AE. Fractalkine signaling in microglia is neuroprotective in the diabetic retina following lipopolysaccharide-induced activation. Abstract. **Oral** Presentation by Mendiola AS. ARVO 2015 Annual Meeting

Garza R., Mendiola AS., Cardona SM., and Cardona AE. – Fractalkine/CX3CR1 controls microglial activation in the brain and retina during acute endotoxemia SACNAS 2015, **POSTER** presentation

Mendiola AS., **Garza R.**, Cardona SM., and Cardona AE. Fractalkine signaling in microglia is neuroprotective in the diabetic retina following lipopolysaccharide-induced activation. **ORAL** Presentation by Mendiola AS. ANS 2015

Garza R., Mendiola AS., Cardona SM., and Cardona AE. - Understanding the Role of Fractalkine on Regional Differences in Microglial Activation UTSA COS Research Conference 2014, **POSTER** presentation.

2) As a junior, I joined the lab of Dr. Youhai Chen at the University of Pennsylvania as a part of the Summer Undergraduate Internship Program. Dr. Youhai's lab focuses on intercellular signaling cascades in immune cells during the onset of multiple sclerosis. The focus of my project was to determine the interaction of TNF alpha-like 8 protein (TIPE) with the serine/ threonine protein kinase, AKT. My data suggested that TIPE interacted with AKT via a bridge formed by phosphatidyl inositol phosphate 2 (PIP2), which provided support for continued investigation of the potential use of TIPE inhibitors as therapeutics for MS. My work resulted in an oral presentation for me at the Leadership Alliance National Symposium.

Abstracts

Garza R., Cathopoulos T., Johnson Derek., and Chen Y. - Phosphatidylinositol phosphates facilitate protein-protein interactions, Leadership Alliance National Symposium 2015, **Oral** presentation.

3) As a senior and post-baccalaureate, I spent time in the lab of Dr. Dennis L Kolson as a part of the University of Pennsylvania Summer Undergraduate Internship Program (SUIP) and Post-Baccalaureate Research Experience Program (PREP), respectively. My research focuses on defining the roles for type I and

type II interferons and associated oxidative stress induce neurodegeneration in HIV infection. My work evolved to include analysis of a common genetic variation in a primary regulator of the host antioxidant response as a risk factor for HIV-induced neurodegeneration. My work resulted in a first-author publication, four co-author publications, multiple posters, and invited oral presentations at national meetings.

Research papers

Garcia-Mesa Y., Xu H., Vance P., Gruenewald AL., **Garza R.**, Midkiff C., Alvarez-Hernandez X., Irwin D., Betts M., Gill AJ., Kolson DL - Dimethyl fumarate, an approved multiple sclerosis treatment agent, reduces brain oxidative stress in SIV- infected rhesus macaques: potential therapeutic re-purposing for HIV neuroprotection – Antioxidants March 2021

Gruenewald AL., Garcia-Mesa Y., Gill AJ., **Garza R.**, Gelman B., Kolson DL - Neuroinflammation associates with antioxidant heme oxygenase-1 response throughout the brain in persons living with HIV - Journal of NeuroVirology Sept 2020

Garcia-Mesa Y., **Garza R.**, Diaz-Ortiz M., Gruenewald A., Bastien B., Lobrovich R., Irwin D., Betts M., Silvestri G., and Kolson DL (2020) - Regional brain recovery from acute synaptic injury in SIV-infected rhesus macaques associates with heme oxygenase isoform expression – J Virology July 2020

Garza R., Gill AJ., Bastien BL., Garcia-Mesa Y., Gruenewald AL., Gelman BB., Tsimba B, Gross R, Letendre SL, Kolson DL (2020) - Heme oxygenase-1 promoter (GT)_n polymorphism associates with HIV neurocognitive impairment - Neurol Neuroimmunol Neuroinflamm May 2020

Gill AJ., **Garza R.**, Ambegaokar SS., Gelman BB., Kolson DL (2018). Heme oxygenase-1 promoter region (GT)_n polymorphism associates with increased neuroimmune activation and risk for encephalitis in HIV infection. J. Neuroinflammation March 2018

Abstracts

Garcia-Mesa Y., Xu H., Vance P., Gruenewald AL., **Garza R.**, Midkiff C., Alvarez-Hernandez X., Irwin D., Gill AJ., Kolson DL - Dimethyl fumarate, an approved multiple sclerosis treatment agent, reduces brain oxidative stress in SIV- infected rhesus macaques: potential therapeutic re-purposing for HIV neuroprotection – International Society of NeuroVirology 2021, **Poster** presented by Garcia-Mesa Y

Garcia-Mesa Y., Xu H., Vance P., Gruenewald AL., **Garza R.**, Midkiff C., Alvarez-Hernandez X., Irwin D., Betts M., Gill AJ., Kolson DL - Dimethyl fumarate reduces brain oxidative stress and inflammation in SIV infection - Conference for Retroviruses and Opportunistic Infections 2021, **Poster** presented by Garcia-Mesa Y

Gill AJ., **Garza R.**, Garcia-Mesa Y., Gruenewald AL., Gelman B., Letendre SL., and Kolson DL. - Heme Oxygenase-1 Promoter (GT)_n Polymorphism Predicts Risk for Neurocognitive Impairment in HIV-Infected Individuals with Higher-Risk Genotypes in African-Americans Annuals of Neurology 2019, **Poster** presented by Gill AJ

Garza R., Gill AJ., Gelman B., Letendre SL., and Kolson DL. - A common (GT)_n repeat polymorphism in the heme oxygenase-1 promoter associates with neuroinflammation and cognitive impairment in HIV infection Association of Neurologist 2019, **Oral**

Gruenewald AL., **Garza R.**, Garcia-Mesa Y., Gelman B., Kolson DL. – Basal ganglia neuronal injury correlates with antioxidant & endothelial adhesion markers in HIV-infected brain Association of Neurologist 2019, **Oral** presented by Gruenewald AL

Garcia-Mesa Y., Bastien BL., **Garza R.**, Gruenewald AL., Gill AJ., Betts MR., Silvestri G., Kolson DL. - Regional Brain Injury in the SIV Macaque Model of HIV is Linked to the Host Antioxidant Response American Association of Neurologist 2019, **Oral** presented by Bastien BL

Gruenewald AL., **Garza R.**, Garcia-Mesa Y., Vance PJ., Gelman B, Kolson DL. – HIV basal-ganglia injury correlates with antioxidant & endothelial adhesion markers Conference for Retroviruses and Opportunistic Infections 2019, **Poster** presented by Gruenewald AL

Garcia-Mesa Y., Bastien BL., **Garza R.**, Gruenewald AL., Gill AJ., Betts MR., Silvestri G., Kolson DL. - Evolving SIV regional brain injury are linked and recovery are linked to antioxidant expression Conference for Retroviruses and Opportunistic Infections 2019, , **Poster** presented by Garcia-Mesa Y

Gill AJ., **Garza R.**, Gelman B., Letendre SL., and Kolson DL. - Heme oxygenase-1 polymorphism associates with neuroimmune activation and neurocognitive impairment in HIV subjects International Society for NeuroVirology 2018, **Poster** presented by Alexander J. Gill

Diaz-Ortiz M., **Garza R.**, Garcia-Mesa Y., Gruenewald AL., Gill AJ., Rossi F., Sethna F., Betts MR., Silvestri G., Kolson DL. - Brain Heme Oxygenase Antioxidant and Type I Interferon Responses in Simian Immunodeficiency Virus (SIV)-Infected Rhesus Macaques: A Model for Human Brain Responses to HIV American Association of Neurologist 2018, **Poster** presented by Diaz-Ortiz M

Gill AJ., **Garza R.**, Ambegaokar SA., Vance PJ., Gelman BB., Kolson DL. - Heme oxygenase-1 polymorphism associates with neuroimmune activation in HIV subjects Conference for Retroviruses and Opportunistic Infections 2018, **Oral** presented by Gill AJ

Garza R., Gruenewald AL., Gill AJ., Diaz-Ortiz M., Rossi F., Sethna F., Betts MR., Silvestri G., Kolson DL. - Regional brain heme oxygenase correlates with SIV load in acute/chronic infection, Conference for Retroviruses and Opportunistic Infections 2018, **Poster**

Garza R., Rossi FR., Gill AJ., Kolson DL. - A novel role for interferons in HIV neuropathogenesis: Interferon driven heme oxygenase-1 loss and increased glutamate production. Upenn Neurovirology and Neuroinflammation Symposium 2017 **Poster**; University of Pennsylvania Center for AIDS Research Conference 2017 **Poster**

Garza R., Rossi FR., Gill AJ., Kolson DL. - Interferon-beta decreases macrophage heme oxygenase-1 expression: role in HIV neuropathogenesis Society for Neuroimmune Pharmacology 2017, **Poster**

Rossi FR., Gill AJ., **Garza R.**, Kolson DL. IFN- β reduces macrophage heme oxygenase-1 expression: role in HIV-neuropathogenesis Conference on Retroviruses and Opportunistic Infections 2017, **Poster** presented by Fiorella P Rossi

Garza R., Rossi FR., Gill AJ., Kolson DL. – Chronic type 1 interferon exposure reduces HO-1 protein expression in human monocyte derived macrophages. SACNAS National Conference 2016, Poster presentation; ABRCMS 2016, Oral Presentation

D. Scholastic Performance

YEAR	SCIENCE COURSE TITLE	GRADE	YEAR	OTHER COURSE TITLE	GRADE
University of Texas at San Antonio			South West Texas Junior College		
2013	Lab Investigations in Biology	A	2012	Intro to Macroeconomics	A
2013	Bioscience	A	2013	American Government	A
2013	Basic Chemistry	A	2013	Algebra for Scientist and Engineers	A
2013	Bioscience II	A	2013	Freshman Composition I	A
2014	General Chemistry I	A	2013	Freshman Composition II	A
2014	General Chemistry I Lab	A-	University of Texas at San Antonio		
2014	Calculus for the Biosciences	A	2013	World Civil to 15 th century	CR
2014	General Chemistry II	A	2013	Elementary Spanish I	CR
2014	Genetics	A	2013	Elementary Spanish II	CR
2014	Genetics Laboratory	A	2013	Intermediate Spanish I	CR
2014	Organic Chemistry I	A	2013	Intermediate Spanish II	CR
2014	Algebra-based Physics I	A+	2013	Upper Division Spanish Elective	CR
2014	Algebra-based Physics I Lab	A	2013	Texas Politics and Society	A+
2014	Probability & Stats for Bioscience	A	2013	Precalculus	A
2015	Advance Physiology	A	2014	Fund Music for Non-Music Major	A+
2015	Microbiology	B	2014	Mariachi Ensemble	A
2015	General Chemistry Lab II	B	2016	US His Pre-Columbus to Cvl War	CR
2015	Organic Chemistry I Lab	A+	2016	US His Civil War to CR present	CR
2015	Organic Chemistry II	A	2016	Mariachi Ensemble	A
2015	Algebra-based Physics II	A-	University of Pennsylvania		
2015	Biochemistry	A	2018	Cell Biology and Biochemistry	A-
2015	Immunology	A	UT Health San Antonio		
2015	Research Careers	A	2019	Molecules of Medicine	HP
2015	Senior Seminar	CR*	2019	Language of Medicine	H
2015	Honor Research	A	2019	Attack and Defense	H
2015	Organic Chemistry II Lab	A	2020	Hematology	H
2016	Microbiology Lab	B	2020	Respiratory Health	H
2016	Medical Mycology	B	2020	Renal and Male Reproduction	HP
2016	Immunology Lab	A	2020	Circulation	HP
2016	Microbial Genetics & Physiology	A	2020	Mind, Brain, and Behavior	H
2016	Honors Research	A	2020	Clinical Skills	H
2016	Intro Clinical Med & Pathology	A	2020	Medicine, Behavior, and Society	H
2016	Biochemistry Lab	A	2020	Endocrine Female Reproduction	HP
2016	Cell Biology	A	2020	Digestive Health and Nutrition	HP
2016	Cell Biology Lab	A	2021	Form and Function	H
2016	Algebra-based Physics II Lab	A			

CR signifies credit earned by AP or CLEP examination. CR* signifies credit earned in a class with no letter grading. Credit was earned by attending class on a weekly bases and presenting scientific literature. Classes at UT Health San Antonio are on a Honors (H), High Pass (HP), Pass (P) bases. IP signifies courses currently in progress.