BIOGRAPHICAL SKETCH

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NAME: Guevara Tique, Alix Andrea

eRA COMMONS USER NAME: GUEVARA.TIQUE.ALIX

POSITION TITLE: Postdoctoral researcher

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Universidad Nacional Autónoma de México, Mexico City, Mexico	Comprehensive course for genomics & transcriptomics data analysis 2022 (70 hrs)	01/2022	Genomics & transcriptomics data analysis
Universidad Nacional Autónoma de México, Mexico City, Mexico	“Bioinformatics in spanish" Viral genomic surveillance and phylogeny workshop (40 hrs)	09/2022	Viral genomics
Universidad del Tolima, Ibagué, Colombia	Ph.D. in biomedical sciences	11/2021	Genomic, Bioinformatics, Gastrointestinal and Infectious diseases, Microbiology, *In vitro* Culture Cancer Genetics
Instituto de Genética, Barbara McClintock IGBM, Lima, Perú	Introduction to Protein Modeling Course (14 hrs)	08/2021	*in silico* Protein Modeling
Unidad de Investigación Médica en Enfermedades Infecciosas y Parasitarias, UMAE Pediatría, IMSS, Mexico City, Mexico	International Internship in Bioinformatic and genomic training	04/2020	Bioinformatic and genomic training, Genomic data analysis
Universidad del Valle, Facultad de Ciencias Naturales y Exactas, Cali, Valle del Cauca, Colombia	Course on the Use of R for Transcriptomics and RNASeq studies (40 hours)	04/2019	R and data analysis
Universidad del Ibagué, Ibagué, Colombia	Phylogeny, adaptation, and Comparative Method in R	04/2016	Evolution and data analysis in R
Universidad del Tolima, Ibagué, Colombia	Biologist	01/2016	Biologist

A. Personal Statement

I am a Postdoctoral researcher at the Interventional Radiology Innovation at Stanford (IRIS) Laboratory. I am deeply interested in gastrointestinal diseases and have extensive training in molecular biology, microbiology, population evolution, bioinformatics, and genetics. In addition, I have expertise in genomic analysis, primary human, organoid, and bacterium *in vitro* culture. During my Ph.D. studies at the Cytogenetic, Phylogeny, and Evolution of Populations research group in Colombia, I focused on the etiology of gastric cancer (GC) and the genomic evolution of *Helicobacter pylori* (*H. pylori*), a bacterium considered a carcinogen class 1 for gastric cancer with a high prevalence in developing countries. My team and I proved the association between the presence of a bacterial genotype (*cagA+IcagE+IvacA s1m1*) and the increase of gastric cancer risk in a mestizo population in Colombia. Additionally, we elucidated this pathogen's ancestry, genomic diversity, and population structure inside the country and another 45 countries, probed the existence of new bacterial subpopulations in America and Australia, and identified the virulence genes that are different in these subpopulations. The genomic

differences described in my research projects contributed to explaining the high gastric cancer incidence and mortality rates reported in Colombia, one of the 25 highest incidence countries of gastric cancer according to the Global Cancer Observatory -GLOBOCAN (2020). I joined Dr. Avnesh Thakor's team as a postdoctoral researcher at Stanford University to further continue my research on gastrointestinal diseases' etiology. Here, I am interested in enhancing Mesenchymal Stem Cells therapies -MSC- (i.e., the actual cells and their derived extracellular vesicles -EVs-) to address inflammation in the setting of Inflammatory Bowel Disease using locoregional approaches for therapy delivery. Specifically, I am investigating the mechanism of action that EVs and MSCs exert to elicit their regenerative potential against disease-specific pathways.

B. Positions, Scientific Appointments, and Honors

Positions:

2023-present	Postdoctoral researcher. Thakor Laboratory, Radiology, School of Medicine at Stanford University.
2022	Visiting Scholar. Carvajal Lab, Genome and Biomedical Sciences Facility, UC Davis.
2020	Co-investigator. Project: "Heterogeneidad genómica intratumoral en cáncer gástrico determinada por análisis del exoma completo". Research group Cytogenetic, Phylogeny, and Population Evolution. Universidad del Tolima.
2020-2021	Young investigator. Project: "Heterogeneidad genómica intratumoral en cáncer gástrico determinada por análisis del exoma completo". Research group Cytogenetic, Phylogeny, and Population Evolution. Universidad del Tolima.
2016-2021	Principal Investigator. Project: "Genómica comparativa de cepas de *Helicobacter pylori* aisladas de pacientes con 5 niveles diferentes de lesiones gástricas premalignas y/o malignas." Research group Cytogenetic, Phylogeny, and Population Evolution. Universidad del Tolima.
2016-2017	Young investigator. Project: "Asociación de componentes de ancestría humana y de *Helicobacter pylori* con cuadros de dispepsia y cáncer gástrico". Research group Cytogenetic, Phylogeny, and Population Evolution. Universidad del Tolima.

Honors:

2021	Meritorious Thesis Award of Doctorate in Biomedical Sciences.
2021	Prize for the best posters in the free communications section of the **Population Genetics and Evolution Area**. XVIII Latin American Congress of Genetics, LIV Annual Meeting of the Chilean Genetics Society, XLIX Argentine Congress of Genetics, VIII Congress of the Uruguayan Genetics Society, I Paraguayan Genetics Congress, V Latin American Congress of Human Genetics - ALAG 2021, Chile.
2020	Young Investigator Award, 22nd World Congress on Gastrointestinal Cancer.
2020	Award for the Women in the Science L'Oréal 2020.
2017	Scholarship for Training High-Level Human Capital for the Department of Tolima- 2016, Ministry of Science, Technology, and Innovation.
2016	Scholarship for Training in Second Language in the Department of Tolima. Government of Tolima.
2015	Honorary scholarship. Universidad del Tolima.
2015	Student scholarship for academic performance and socioeconomic conditions type A. Academic semester B. Universidad del Tolima.
2015	Student scholarship for academic performance and socioeconomic conditions type B. Academic semester A. Universidad del Tolima.
2014	Student scholarship for academic performance and socioeconomic conditions type B. Academic semester B. Universidad del Tolima.
2014	Student scholarship for academic performance and socioeconomic conditions type A. Academic semester A. Universidad del Tolima.
2013	Student scholarship for academic performance and socioeconomic conditions type A. Academic semester B. Universidad del Tolima.
2013	Student scholarship for academic performance and socioeconomic conditions type B. Academic semester A. Universidad del Tolima.

2011 Student scholarship for academic performance and socioeconomic conditions type B, Universidad del Tolima.

C. Contributions to Science

During the last six years, I have published over ***seven peer-reviewed articles*** (six as first author). My primary area of research includes the application of molecular biology, bioinformatics, and genomics to understand gastrointestinal diseases' etiology, with a special interest in infectious risk factors.

1. My early publications directly addressed the virulence profiles of *H. pylori* strains, a recognized risk factor for GG, to colonize the antrum of patients with different gastric lesions, from preneoplasia to GC, from a South American region with high GC mortality rates; and proved that exists an association between the presence of *cagA*+/*cagE*+/*vacA* s_1m_1 bacterial genotype and the increase of GC risk, whereas *cagA*-/*cagE*-/*vacA* s_2m_2 genotype was associated a marker for decreased risk. These outcomes are in several reports, including -

- Guevara-Tique, A., Olaya, J. S., Castro-Valencia, F., Gil, G. P., Torres, R., Torres, J., ... & Lozano, M. B. SO-11 "Molecular evaluation of *Helicobacter pylori infection* in 470 Colombian patients with premalignant lesion and gastric cancer". Annals of Oncology, 2020, ISSN: 1569-8041 ed: Oxford University Press (UK) v.31 fasc.N/A p.S221 - S221. DOI: https://doi.org/10.1016/j.annonc.2020.04.026.

2. In addition, I analyzed Colombian strains' ancestry and genomic diversity and the genome of strains from worldwide *H. pylori* populations to discern their ancestry and adaption to Colombian people. I identified two Colombian bacterial subpopulations with a geographic origin and genetic variants significantly fixed in virulence genes of the constitutive genome of these subpopulations, which encode mainly for outer membrane and central metabolism proteins. The selective pressure in virulence genes, especially on genes involved in the first guest-host, could explain the contrast in GC risk between Colombian departments and a high incidence of premalignant gastric lesions and GC mortality rates in the Country.

In developing this research, I have standardized the isolation and *in vitro* culture of the *H. pylori* strain from Colombian patients' antrum biopsies and gastric juice, participated in diverse scientific events, and published scientific articles, allowing me to receive several academic awards. My studies led to several first-author publications, including -

- Guevara-Tique, A. A., Torres, R. C., Bravo, M. M., Carvajal Carmona, L. G., Echeverry de Polanco, M. M., Bohórquez, M. E., & Torres, J. Recombination events drives the emergence of Colombian *Helicobacter pylori* subpopulations with self-identity ancestry. Virulence, 2022, 13(1), 1146-1160. DOI: https://doi.org/10.1080/21505594.2022.2095737.
- Guevara-Tique, A. A., Torres, R. C., Suaréz, J. J., Castro-Valencia, F. L., Parra, G., Torres, J., ... & Bohórquez, M. E. (2020). "Genome Sequences of Three Colombian *Helicobacter pylori* Strains Isolated from Tolimense Patients." Microbiology resource announcements, 2020, 9(18), e00117-20. ISSN: 2576-098X ed: American Society for Microbiology v.N/A fasc.N/A p. -. DOI: https://doi.org/10.1128/MRA.00117-20.

Additionally, my team and I reported in public databases the raw and assembled genomic sequences from the *H. pylori* strains that we isolated, including -

- GCT43, *H. pylori* genomic sequence.
  Guevara-Tique A. A., Castro, F. L., Suarez, J. J., Bohórquez, M. E., Echeverry De Polanco, M. M. Database: GenBank, SRA. National Center for Biotechnology Information (NCBI), 2020. Access URL: https://www.ncbi.nlm.nih.gov/biosample/13950473.

3. Recently, I have explored the genetic factors associated with developing gastrointestinal diseases, and as a postdoctoral researcher, I am applying molecular biology and bioinformatics tools to understand the

inflammatory bowel disease bioenergetic mechanism in pediatric patients and the role of MSCs therapy in the chronic and acute stages of the disease.

- Toal, T. W., Estrada-Florez, A. P., Polanco-Echeverry, G. M., Sahasrabudhe, R. M., Lott, P. C., Suarez-Olaya, J. J., ... & Carvajal-Carmona, L. G. Multiregional Sequencing Analysis Reveals Extensive Genetic Heterogeneity in Gastric Tumors from Latinos. *Cancer Research Communications*, 2022, *2*(11), 1487. DOI: https://doi.org/10.1158/2767-9764.CRC-22-0149.

Complete List of Published Work:

https://orcid.org/0000-0003-0856-5455

Complete List of Public genomic sequences reported in NIH:

https://www.ncbi.nlm.nih.gov/bioproject/604073

Participation in scientific projects:

- UT/MINCIENCIAS: 40218
  Guevara-Tique/Bohórquez/Echeverry/Carvajal 02/2018-11/2021
  Comparative genomics of *Helicobacter pylori* isolated from premalignant and malignant gastric lesion.
  Role: PI

- UT/UCDavis: 250120
  Guevara-Tique /Bohórquez/Echeverry/Carvajal
  07/2020-07/2023
  Heterogeneidad genómica intratumoral en cáncer gástrico determinada por análisis del exoma completo.
  Role: CI

- UT/MINCIENCIAS: 470115
  Guevara-Tique /Bohórquez/Echeverry/Carvajal 06/2015-06/2018
  Evaluación del exoma de pacientes colombianos con cáncer gástrico y del genoma de *Helicobacter pylori*. Role: CI

Scientific Reports:

1. Scientific and Technical Report. Project: "Comparative genomics of *Helicobacter pylori* strains isolated from patients with five different levels of premalignant and/or malignant gastric lesions," contract/registration: 40218, in Colombia, 2019, 2020, 2021.
2. Scientific and Technical Report. Project: "Evaluation of the exome of Colombian patients with gastric cancer and the genome of *Helicobacter pylori*," contract/registration: 110565843382. In: Colombia, 2021.
3. Scientific and Technical Report. Project: " Study of the ancestry and genomic variants of Helicobacter pylori in patients with gastritis." In: Colombia, 2019.