



Bernardo Chombo Álvarez

Genomic Sciences undergraduate student

Hacienda de Echegaray 114, Hacienda de Patejé, Naucalpan de Juárez, Estado de México, México. C.P. 53300.

bchombo@lcg.unam.mx

bernardo.chombo@ibt.unam.mx

<https://bernardochoomboalvarez.github.io/>

+52 (55) 3234-8105

Professional profile

I am a Genomic Sciences undergraduate student at the National Autonomous University of Mexico (UNAM) with interest in neurodevelopmental disorder genomics and the usage of computational biology for identification and comprehension of their involved genes, as well as the usage of gene therapies for medical purposes. I have a high academic capacity, critical and ethical performance and social commitment. My personal values are respect, honesty, perseverance, responsibility and dedication. I strongly believe that the study and understanding of neurodevelopmental genomics is capable of generating a positive impact and improving people's quality of life.

Education

- *Baccalaureate*, **Youth Institute of the State of Mexico, B.C.** 2018-2021
- *B.Sc. in Biology (2 semesters)*, **National Autonomous University of Mexico – Faculty of Sciences**, 2021-2022
- *B.Sc. in Genomic Sciences*, **National Autonomous University of Mexico - Genomic Sciences Center**, 2022-present

Languages

Spanish: native

English: proficient

French: basic

Interests

Neurodevelopmental disorder genomics, Alzheimer's disease, cancer, bioinformatics, computational biology, biotechnology, regulatory networks, transcriptomics, population genetics, human genetics, genetic engineering.

Abilities

Handling of complex laboratory equipment and instruments (advice from Ph.D. Miguel Ángel Cevallos Gaos, Ph.D. Armando Hernández García, M.Sc. Ximena del Toro Ríos, M.Sc. Carlos Humberto Martínez Álvarez). Protein production. Handling of Atomic Force Microscopy and of Epifluorescence Microscopy. Partial handling of Spinning Disk Confocal Microscopy. Design and evaluation of biosensors. Database management, creation of scripts and functional programs for bioinformatic analysis and computational biology (advice from Ph.D. Julio Augusto Freyre González, Ph.D. Alejandro Ángel Garciarubio Granados, Ph.D. Mishael Sánchez Pérez, B.S. Heladia Salgado Osorio).

- Teamwork
- Solution focused
- Proactive
- Handling of laboratory equipment
- Calculus
- Bash
- R
- Python
- C
- Perl
- PCR, qPCR
- Immunostaining
- Tissue extraction
- Western Blot
- ELISA
- EMSA
- Primer design
- Bioinformatics
- Computational Biology
- Assemble genomes
- Cell culture
- Molecular Biology
- Immunology
- Cell Biology
- Neurobiology
- Transcriptomics
- Biochemistry
- Genetics
- Statistics
- Microbiology
- Metagenomics
- Leadership
- Analytical skills
- Project management
- Proteomics
- RNAseq analysis
- Probabilistics

Research Experience

Laboratory of Dr. Lorenzo Patrick Segovia Forcella, Institute of Biotechnology, National Autonomous University of Mexico

Undergraduate Researcher

Ph.D. Lorenzo Patrick Segovia Forcella's research group / January 6, 2023 – February 29, 2024

- Undergraduate research in charge of M.Sc. Rafael López Sánchez and under the assistance of Ph.D. Lorenzo Patrick Segovia Forcella and the support material of Ph.D. Alejandro Ángel Garciarubio Granados. The work has consisted in the exploration and identification of the diversity of CAZymes (carbohydrate degrading enzymes) in marine sediment samples obtained by the Gulf of Mexico Research Consortium. The aim is to identify the beta diversity, substrate, ecosystem and taxonomy of CAZymes and PULs (polysaccharide utilization loci) identified in the sediments associated with the project's MAGs. For data analysis, scripts were generated in Shell and R. A publication is expected in the following months.

Laboratory of Biomolecular Engineering and Bionanotechnology, Institute of Chemistry, National Autonomous University of Mexico

Undergraduate Researcher

Ph.D. Armando Hernández Garcia's research group / June 5, 2023 - present

- Undergraduate research in charge of M.Sc. Ximena del Toro Ríos and B.S. Marco Antonio Chávez Piñón. In the project *Targeted-delivery Therapeutic RNA to Breast Cancer Cells through C-S-B Virus-like Proteins* my participation consisted in helping to produce recombinant proteins, and in the projects *Development of a Genetic Detection System for the Four Serotypes of Dengue Virus through CRISPR-Cas12a Machinery* and *Development of a Genetic Detection System for Trypanosoma cruzi (Chagas disease) through CRISPR-Cas12a Machinery* consisted in evaluating the effectiveness of the primers and gRNAs designed for the detection tools, as well as contributing in bioinformatic analysis. Additionally, I participated in the creation of different programs in Python, for example, a program to download bulk data from NCBI and UniProt, a program that uses the BLAST tool and the NCBI database to evaluate the taxonomic diversity of DNA sequences. Two publications are expected in

the coming months. I am currently providing support for bioinformatic and computational biology analysis.

Neuroimmunobiology Consortium, Institute of Biotechnology, National Autonomous University of Mexico

Undergraduate Researcher

Ph.D. Leonor Pérez Martínez and Ph.D. Martín Gustavo Pedraza's research group / August 5, 2023 - present

- Undergraduate research in charge of M.Sc. Carlos Humberto Martínez Álvarez. In the project *Sensorial neurons and the regulation of immunity in the meninges* for the evaluation of different markers of cell type and activation in meningeal tissues of mouse models of Alzheimer's disease (5xFAD). My participation has consisted in developing skills in the extraction of meninges, in the ethical handling of mice, preparation of tissues for immunofluorescence staining tests and in the design of primers to measure the expression levels of different cellular markers related to Alzheimer's disease. Additionally, I have contributed to the update and improvement of a program for qPCR data analysis and participated in the creation of a program for automated primer design in Python. A publication is expected within two years.

Honors and Awards

- 2020 *Finalist in the XXVIII, University Contest, Science Fair.*
National Autonomous University of Mexico.
- 2021 *Second Place in the area of Health Sciences, Field Research modality, Local category in the XXIX University Contest, Science Fair.*
National Autonomous University of Mexico.
- 2024 *Awarded with a full scholarship for the Vienna BioCenter Summer School program 2024.*
Vienna BioCenter, Max Perutz Labs, University of Vienna.

References

Leonor Pérez Martínez, Ph.D.

Department Head, Molecular Medicine and Bioprocesses Department.
Institute of Biotechnology, National Autonomous University of Mexico.
leonor.perez@ibt.unam.mx
+52 (777) 329-1620

Martín Gustavo Pedraza Alva, Ph.D.

Head of the Neuroimmunobiology Consortium, Department of Molecular Medicine and Bioprocesses, Institute of Biotechnology, National Autonomous University of Mexico.
Institute of Biotechnology, National Autonomous University of Mexico.
gustavo.pedraza@ibt.unam.mx
+52 (777) 257-3982

Armando Hernández García, Ph.D.

Senior Researcher, Department of Chemistry of Biomacromolecules.
Institute of Chemistry, National Autonomous University of Mexico.
armandohg@iquimica.unam.mx
+52 (55) 5622-4548

Lorenzo Patrick Segovia Forcella, Ph.D.

Senior Researcher, Department of Cellular Engineering and Biocatalysis.
Institute of Biotechnology, National Autonomous University of Mexico

lorenzo.segovia@ibt.unam.mx