Elizabeth Márquez-Gómez

◉ Munich, Germany   ✉ elizabeth.marquezgomez@helmholtz-munich.de   ☎ 1551 002 11 74

🔗 elizabeth-mqz-gmz.github.io   in elizabeth-marquez-gomez   ⌂ Elizabeth-mqz-gmz

My goal is to contribute to the biomedical research field by applying computational methods to identify new targets for the development of innovative strategies, towards the prevention and treatment of diseases.

Education

Universidad Nacional Autónoma de México (UNAM-CCG-IBT)   *Morelos, Mexico*
BS with Honors in Genomic Sciences   *Fall 2019 – Spring 2023*

- GPA: 9.7/10
- *Dissertation:* Linking the effect of genetic risk variants in respiratory diseases through immune cells.
- *Thesis Committee:* Pandurangan Vijayanand, MD, PhD; Benjamin Schmiedel, PhD; Yvonne Rosenstein, PhD.
- Member of the academic board as the representative of class 2023.

Escuela Nacional Preparatoria 6 "Antonio Caso" (UNAM-ENP)   *Mexico City, Mexico*
High School   *Fall 2016 – Spring 2019*

- GPA: 9.41/10
- *Computer Technician* title from specialized technical studies as extracurricular activities.

Research Experience

Helmholtz Zentrum München - Institute of Epigenetics and Stem Cells   *Munich, Germany*
Research assistant   *February 2023 - Present*

Mentor: *Stephan Hamperl, Ph.D.*, Division of Chromosome Dynamics and Genome Stability

Chromatin dynamics in regions susceptible to simultaneous DNA replication and transcription, with a focus on genome instability and DNA damage.

La Jolla Institute for Immunology   *San Diego, USA*
Research technician   *June 2021 - August 2023*

Mentor: *Pandurangan Vijayanand, M.D., Ph.D.*, Division of Vaccine Discovery

Integrating genomic and functional data to link genes to disease via immune cells and proposing potential targets associated with risk variants driving genetic susceptibility.

Publications

Werner, M., Trauner, M., Schauer, T., Ummethum, H., **Márquez-Gómez, E.**, Lalonde, M., Lee, C., Tsirkas, I., Sajid, A., Chaves Murriello, A., Längst, G., Hamperl, S. *"Transcription-replication conflicts drive R-loop-dependent nucleosome eviction and require DOT1L activity for transcription recovery".* In *Nucleic Acids Research,* Volume 53, Issue 4, (Feb 2025), gkaf109. DOI: 10.1093/nar/gkaf109.

Manuscripts in revision:

- Ummethum, H., Chaves Murriello, A., **Márquez-Gómez, E.**, König, A., Kruse, E., Lalonde, M., Werner, M., Trauner, M., Chanou, A., Weiss, M., Lee, C., Ettinger, A., Erhard, F., Hauck, S., Hamperl, S. *"The CGG triplet repeat binding protein 1 counteracts R-loop induced transcription-replication stress."*

Manuscripts in preparation:

- Schmiedel, B. J., Fajardo, V., Gonzalez-Colin, C., Rocha, J., Simon, H., **Márquez-Gómez, E.**, De la Cruz Castillo, A., Greenbaum, J. A., Peters, B., Chandra, V., Ottensmeier, C., Ganesan, A. P., Vijayanand, P., *"High resolution single-cell analysis of tissue-resident immune cells identifies genetic links to human immune-mediated diseases."*

Presentations

EMBO — EMBL Symposium DNA replication: from biology to disease *Heidelberg, Germany*
Poster presentation *November 2024*

"The CGG triplet repeat binding protein 1 counteracts DNA secondary structure formation to prevent transcription-replication stress."

Teaching

Helmholtz Zentrum München *Munich, Germany*
Instructor at the Helmholtz Summer School on Chromatin Biology *August 2024*

- Bioinformatic protocols: data processing, chromatin profiling methods, peak and motif finding, differential analysis, and workflow design. Command line, usage of the HPC environment through SLURM workload management, environment management, and theory of reproducible research.

Undergraduate program on Genomic Sciences (UNAM-CCG-IBT) *Remote*
Teaching Assistant at Evolutionary and Population Genetics course *August - December 2021*

- Prepared class materials and lectures, designed assignments, and supported student advisory.

Escuela Nacional Preparatoria 6 "Antonio Caso" (UNAM-ENP) *Mexico City, Mexico*
Instructor at Full Stack Web Development Course *April - June 2019*

- Front-end markup and Back-end, analysis and design of relational databases, web project integration, project management, and introduction to web security.

Skills

Programming languages: Python, R, Bash , C, C++, Perl, PHP, JavaScript, SQL, HTML, CSS

Bioinformatics: Sequence processing, differential expression analysis, ChIP-seq, bulk and single-cell RNA-seq analysis, analysis of genetic variants, retrieval and parsing of public data

Developer tools: Snakemake, Git, GitHub, GitLab, SLURM

Languages: Spanish (Native), English (C1-Advanced, TOEFL iBT 107/120), Italian (Elementary)

Awards and Scholarships

- **UNAM High Academic Demand Scholarship 2019- 2021**
- **XXVII University Contest: "Science, Technology and Innovation Fair" (UNAM)**, April 2019.
  POSTBOT: assistant robot for mail delivery in offices. Robotics category, Technological Development: *First place.*
- **Inter High School Contest, Escuela Nacional Preparatoria 7 "Ezequiel A. Chávez" (UNAM-ENP)**, February 2019.
  Coding category, local level: *Second place.*

Workshops

Clubes de Ciencia México *Remote*
CdeCMX Challenge: Scientific solutions to emerging problems. Life during the *August 2020*
pandemic.

Escuela Nacional Preparatoria 6 "Antonio Caso" (UNAM) *Mexico City, Mexico*
Full stack web development course. *April - June, 2018*

Clubes de Ciencia México *Xalapa, Mexico*
Turn Ideas into Reality: The science of Biomedical Research. *Summer, 2017*