Erick Cuevas-Fernández

Bioinformatician · Biological data scientist

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PROFILE

Biochemist and PhD candidate in Biochemical Sciences at the National Autonomous University of Mexico (UNAM, Universidad Nacional Autónoma de México). I analyse next-generation DNA sequencing (NGS) data from Illumina and Oxford Nanopore platforms using comparative genomics, metagenomics, statistics and machine learning, and I develop analysis pipelines and R packages. Interests: big data, the genomics of psychiatric and neurodegenerative disorders, and reproducible scientific software.

EDUCATION

- **PhD in Biochemical Sciences** (candidate). National Autonomous University of Mexico (UNAM). 2020–2025
- **MSc in Biochemical Sciences.** UNAM. Honourable mention; the examination committee recommended nomination for the Alfonso Caso Medal. 2018–2020
  Thesis: "Identificación de biomarcadores asociados a demencia para proponer un sistema biológico neuronal y circulante para su estudio" (dementia-associated biomarkers to propose a neuronal and circulating biological system for their study). Advisor: Dr Heriberto Manuel Rivera.
- **BSc in Biochemistry and Molecular Biology** (Licenciatura en Ciencias). Autonomous University of the State of Morelos (UAEM, Universidad Autónoma del Estado de Morelos). 2013–2017
- **Pharmaceutical Industrial Laboratory Technician.** UAEM. 2009–2012

PROFESSIONAL EXPERIENCE

- **Research and Development** — Grupo ININBIO. Genomic and metagenomic analyses; development of analysis pipelines and R applications for the Genomics Laboratory. Current
- **Bioinformatician** — OMICs Analysis. Shotgun and marker-gene metagenomics for public- and private-sector clients; genome assembly and annotation workflows; machine-learning models for comparative genomics. 2024–present
- **Data analyst** — National Institute of Public Health (Instituto Nacional de Salud Pública), Mexico. Data analysis for public-health initiatives. 2025
- **Data analyst** — School of Medicine, UAEM. Statistical methods applied to specialised health databases. 2024

RESEARCH EXPERIENCE

- **Laboratory of Systems Biology and Translational Medicine**, UAEM. MSc and PhD projects on single-nucleotide polymorphisms (SNPs) associated with dementia. Since 2018
- **Research residency, Laboratory of Cellular Immunology**, UAEM. BSc thesis on the association of CBP/β-catenin and p300/β-catenin at the promoter regions of selected Wnt/β-catenin response genes. Supervisor: Dr Ma. Angélica Santana Calderón. 2016–2017
- **Laboratory of Viral Dynamics and Carcinogenesis**, UAEM. Molecular typing of human papillomavirus to support clinical diagnosis. Supervisor: Dr Raúl Peralta Rodríguez. 2016–2017

- **Laboratory of Invertebrate Neurogenetics**, Institute of Biotechnology, UNAM. Identification and characterisation of genes involved in the perception and processing of nociceptive signals in *Drosophila melanogaster*. Supervisor: Dr Enrique Reynaud Garza. 2014–2015
- **Research stay, Chemical Research Center**, UAEM. Asymmetric synthesis of aminophosphonic acids. 2012

PUBLICATIONS

Journal articles

- Loredo Guillén M, **Cuevas Fernández E**, Hermosillo Valadez J, Rivera M. Evaluación de riesgo poligénico de SNPs relacionados con la aterosclerosis [Polygenic risk assessment of SNPs related to atherosclerosis]. *Nova Scientia*. **Accepted (November 2026), in press.**
- Hernández-Acevedo GN, López-Portales OH, Gutiérrez-Reyna DY, **Cuevas-Fernández E**, Kempis-Calanis LA, Labastida-Conde RG, Aguilar-Luviano OB, Ramírez-Pliego O, Spicuglia S, Lino-Alfaro B, Chagolla-López A, González-de la Vara LE, Santana MA. (2019). Protein complexes associated with β-catenin differentially influence the differentiation profile of neonatal and adult $CD8^+$ T cells. *Journal of Cellular Physiology*. doi:10.1002/jcp.28502. PMID: 30924167.

Submitted manuscripts

- **Cuevas-Fernández E**, Pérez-Martínez L. RORB Neurons in Braak Progression: A Comparative Analysis of Frontal Cortex and Entorhinal Cortex Dysregulation Patterns. **Submitted.**

CONFERENCE PRESENTATIONS

- **Cuevas Fernández E**, Sánchez-Contla LM, Rivera HM. *Putative single nucleotide polymorphisms associated with Alzheimer's disease by artificial intelligence strategy.* Oral. 4th Neurobiology Congress, Mexican Society of Biochemistry, Oaxaca, Mexico. 2022
- Brito Bahena OD, Villarreal Reyes FA, Beltrán-Hernández NE, **Cuevas-Fernández E**, Rivera HM. *Farmacogenética de biomarcadores asociados a demencia.* Poster, third place in category B2. 23rd Summer of Scientific Research in Morelos, Mexico. 2019
- **Cuevas Fernández E**, Moncada Vázquez C, Sánchez Méndez J, Loredo Guillén M, Rivera HM. *Identification and Classification of Single Nucleotide Polymorphisms as Biomarkers associated with Dementia through Data Mining and Machine Learning.* Oral. 32nd National Congress of Biochemistry, Ixtapa-Zihuatanejo, Guerrero, Mexico. 2018
- Villarreal Reyes FA, **Cuevas-Fernández E**, Rivera HM. *Sistemas celulares in silico como modelo para el estudio de la demencia* (in silico cellular systems as a model to study dementia). Oral. 32nd National Congress of Biochemistry, Ixtapa-Zihuatanejo, Guerrero, Mexico. 2018
- **Cuevas Fernández E**, Gutiérrez Reyna DY, López Portales OH, Gómez Gómez O, Hernández Acevedo GN, Ramírez Pliego O, Santana MA. *Differential recruitment of β-catenin to the promoters of genes associated with proliferation and differentiation in neonate and adult $CD8^+$ T cells.* Poster. 4th Signal Transduction Congress, Puerto Vallarta, Jalisco, Mexico. 2017

TEACHING

- **Genetics lecturer.** School of Medicine, UAEM. 2024
- **Instructor.** CDSB 2023: Building R/Bioconductor packages for single-cell transcriptomic analysis. Mexican Bioinformatics Meeting (EBM, Encuentro de Bioinformática en México) 2023, National Bioinformatics Node and Community of Bioinformatics Software Developers (CDSB). 2023

- **Instructor.** CDSB 2022: Advanced metagenome analysis — building your own R/Bioconductor workflows. EBM 2022. 2022
- **Instructor.** Workflows with RStudio and building Shiny apps. EBM 2021. 2021
- **Certified Library Carpentry Instructor**, The Carpentries. 2021
- **Instructor.** "Introduction to R and RStudio" mini-course, Mexican Bioinformatics Network. 2020
- **Instructor.** Online courses "Exploratory data analysis" and "Advanced R". 2020
- **Instructor.** R programming workshop, Laboratory of Systems Biology and Translational Medicine, School of Medicine, UAEM. 2019
- **Mentor**, with Dr Heriberto Manuel Rivera, of the third-place poster (category B2) at the 23rd Summer of Scientific Research in Morelos. 2019

TALKS AND OUTREACH

- *Five principles to grow up your R community.* useR! 2021. 2021
- *SNPverso y demencia* and *CDSB communities presentation.* ConectaR 2021. 2021
- "Artificial intelligence: reality or science fiction?" Welcome sessions, School of Nutrition, UAEM. 2019
- "Artificial intelligence." Eighth-semester nursing students, School of Nursing, UAEM. 2019

SOFTWARE (R PACKAGES)

seekerBio (gene and SNP information across databases) · hgdp (Human Genome Diversity Panel) · sgdp (Simons Genome Diversity Project) · ChemLigand (physicochemical properties of ligands and proteins) · CardiovascularRisk (cardiovascular risk score) · mxearthquakes (co-author; earthquakes in Mexico) · enpecyt2017, pef2021 and TransparenciaPresupuestariaProgramas (Mexican open data) · qualitycheck · CriptoDummy · starwarssay. Code at github.com/Erickcufe.

AWARDS

- Third place, Alzheimer Award 2021–2022 (2nd edition), Fundación Moisés Itzkowich – Fundación UNAM. 2021–2022
- Aida Weiss Award, University Health Research Programme (PUIS, Programa Universitario de Investigación en Salud), UNAM, graduate thesis category. 2020
- Honourable mention in the MSc examination and committee recommendation for the Alfonso Caso Medal. 2020
- Third place in academic achievement, BSc in Biochemistry and Molecular Biology, Institute for Research in Basic and Applied Sciences, UAEM. 2016

SERVICE

- Board member, Community of Bioinformatics Software Developers (CDSB, Comunidad de Desarrolladores de Software en Bioinformática). 2021–2022

ADDITIONAL TRAINING

- Tools for Professional Presentations and Pronunciation in English (12 h). UNAM-Tucson, Center for Mexican Studies. 2022
- Pre-congress course "Organoids and single-cell sequencing in Neuroscience". 4th Neurobiology Congress, Mexican Society of Biochemistry. 2022

- Library Carpentry Instructor Training. The Carpentries. 2021
- BioC2020 and BioC2021 conferences (Bioconductor). 2020–2021
- CDSB workshop: Building RStudio and Bioconductor workflows for single-cell transcriptomic (RNA-seq) data. EBM 2020. 2020
- Complete Machine Learning course: Data Science with RStudio (51 h). Udemy. 2020
- CDSB Workshop: How to build and create tidy tools. EBM 2019, Center for Genomic Sciences, UNAM. 2019
- Workshops at the International Meeting on Artificial Intelligence and its Applications (RIIAA 2.0): Deep learning for text mining, Graph networks, and Deep generative models (VAE/GAN). Center for Complexity Sciences, UNAM. 2019
- Future of Individualized Medicine. La Jolla, California, USA. 2019
- Deep Learning course-workshop (60 h). Center for Research in Sciences, UAEM. 2018
- International Bioinformatics Workshop (TIB, Taller Internacional de Bioinformática) 2018, workshop T2: Exploratory and statistical analysis of biological data using R. Center for Genomic Sciences, UNAM. 2018
- First Symposium on Functional Genomics and Systems Biology. Center for Research in Cellular Dynamics, UAEM. 2016
- 30th National Congress of Biochemistry. Guadalajara, Jalisco, Mexico. 2014
- Diploma course “The importance of forensic sciences in the adversarial justice system” (160 h). UAEM. 2012

TECHNICAL SKILLS

- **Programming:** R, Python, Bash, Git; Amazon Web Services EC2.
- **Genome assembly and annotation:** Flye, SPAdes, Canu, Bakta, Prokka, BLAST, DIAMOND.
- **Quality control:** FastQC, NanoPlot, CheckM, average nucleotide identity (ANI), QUAST, BUSCO.
- **Metagenomics:** SqueezeMeta, Kraken, MetaPhlAn, QIIME 2, DADA2.
- **Comparative genomics and phylogenetics:** Roary, RAxML.

LANGUAGES

Spanish (native) · English (IELTS Academic, 2019; B2) · French (B1)

Updated: November 2026