Daniel Gomez

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daniel.gomez.csi@gmail.com | Pleasanton, CA

Graduate Student Researcher

Spatial-Omics | Multiomics Analysis | Data Integration | Next-Generation Computational Tools | AI Virtual Cells | Therapeutic Predictions | Generative AI Models | Single-cell Genomics | Scientific Research | NGS | Multiplex Imaging

Genomics Technologist discovery-driven detail-oriented in Computational Biology with a BS in Cell and Molecular Biology and focus on immuno-oncology data analysis, single-cell pipelines, and bioinformatics tool integration and development. Experienced in building scalable, high-performance computational workflows, statistical models, hypothesis generation, and generative AI interorgan communication maps in large consortia such as MoTrPAC, HuBMAP, Human Cell Atlas, HTAN, and PsychENCODE.

Core Competencies

- **Programming Languages:** Python, R, Bash, Perl
- **Bioinformatics Tools:** Seurat, Scanpy, Squidpy, SpatialData, OmniPath, LIANA+, NiCO, NCBI, SAMTools, BLAST
- **Data Analysis and Visualization:** Pandas, NumPy, Seaborn, Matplotlib, Scikit-learn
- **Environments:** Linux, Git, HPC clusters, Docker
- **Concepts:** Statistical modeling, deep learning fundamentals, object-oriented design, scale data

Career Experience

Biology Graduate | Stanford University School of Medicine, Snyder & Nolan Lab | *Aug 2023 – Present*
Trained in graduate school for my master's degree partial requirement to write a thesis in Biological Sciences at CSU East Bay. My thesis project generated a list of exerkines, ligands, and receptors of RNA, protein, and metabolites with MoTrPAC, generated organ single spatially resolved data maps with HuBMAP and Human Cell Atlas, PsychENCODE, and HTAN consortia using multi-omics analysis, single-cell, spatial-multi-omics technologies such as 10x Genomics Chromium, Visium, VisiumHD, Xenium, CODEX/Phenocycler, STOmics Stereo-seq, and Vizgen MERSCOPE/MERFISH spatial-omics data and augmented my thesis with applied immunotherapy maps and XAI gut microbioime profiles for immunotherapy predictions and immunoengineered therapeutics.

Genetics Intern | Stanford University School of Medicine, Snyder Lab | *May 2024 – Aug 2024*
Learned how to calculate, compute, test, train, map, fine-tune machine learning models in genetics, single-cell, spatial-omics, multi-omics, immuno-oncology, pathology, and write proposals for academia, industry, and academia-industry partnerships in training grants.

Lab Assistant II | Roche Diagnostics | *May 2022 – Aug 2022*
Contributed to antibody formulations in Roche Tissue Diagnostics (RTD) Global Operations by assisting with molecular assay development and execution, supported the development of Companion Diagnostics and In Vitro Diagnostics (IVD) products for personalized healthcare. Executed preparation and quality control of lab reagents and performed precise buffer preparation for tissue diagnostics protocols.

Formulations Operator II | Thermo Fisher Scientific | *Sept 2019 – Jan 2022*
Operated high-throughput robotics including Hamilton Microlab Star, TECAN, and Bravo Velocity for NGS panel manufacturing, Oligonucleotide Production, manufactured custom primers and NGS panels following strict SOPs and batch records. Provided technical troubleshooting for automated lab equipment and evaluated non-routine test results to ensure product quality.

Anesthesiology Technician | University of California, San Diego, School of Medicine | *Jan 2014 – Jun 2014*
Conducted *ex vivo* heart perfusion studies in *Mus musculus* isolated heart stand Langendorff heart apparatus surgical protocols executed precise mouse surgical protocols for organ isolation and established a organ-to-cell assay from the heart organ to cardiomyocyte. Performed advanced metabolic profiling of cardiomyocyte cell cultures using the Seahorse XF Extracellular Flux Analyzer. Evaluated cardiac response and signaling through somatostatin assays to study physiological health, obesity, and diabetes.

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Immunology Technician | John A Burns School of Medicine, University of Hawaii at Mānoa | *Sept 2013 – Jan 2013*
Conducted neurovirology molecular mechanism studies on chronic neuroinflammation in HIV-1 Associated Neurocognitive Disorders (HAND) patients. Imaged and analyzed data using Light, Fluorescent Microscopy, performed FFPE immunohistochemistry, RNA in situ hybridization (QuantiGene ISH), and PBMC transmigration assays in Blood-Brain Barrier (BBB) models.

Research Projects & Open-Source Contributions

MS Research Project | **ExerkineMap** | **Stanford Medicine** | 2023-2026

Pioneered a high-impact generative AI tool for mapping exerkines, ligands, and receptors multi-omics, single-cell, and spatial data.

- Developed a novel tool for deep omics profiling and mapping exerkines using AI and multi-omics data
- Engineered a ML model in Python, validated with simulation and experimental methods.
- Presented at HuBMAP Working Group Meeting

Academic Experience

Teaching Associate | California State University, East Bay | *Aug 2022 – Jan 2023*
Designed lab materials, graded coursework, and mentored students across disciplines in Clinical Microbiology (BIO230) where I taught lab sections covering identification and microbiology culture techniques of microorganisms for health sciences and nursing majors, and a TA in Human Anatomy and Physiology I (BIO270) where I led the lab through analysis of skeletal, muscular, nervous, cardiovascular, and respiratory system. I taught sections of around 20 university students and collaborated with faculty on curriculum presentation.

Symposium Poster | 22nd Microbiology Student Group Symposium | 2023
"Co-infection and cancer: Viral oncogenesis in humans result in liver, blood, and brain cancer by host-pathogen interactions"

Teaching Assistant | University of Hawaii at Mānoa | *Sept 2011 – Jan 2012*
Lectured undergraduates on laboratory protocols, chemical concepts, and safety procedures. Managed reagent preparation, supervised lab sessions, and designed weekly quizzes to assess student progress. Responsible for grading lab reports and managing end-of-semester grade calculations for all students.

Education and Professional Development

Certificate, AI/ML Fundamentals, Department of Genetics, Stanford University School of Medicine, Stanford Data Ocean, Stanford Deep Data Research Center

Certificate, Bioinformatics Fundamentals of Data Science in Precision Medicine and Cloud Computing, Department of Genetics, Stanford University School of Medicine, Stanford Data Ocean, Stanford Deep Data Research Center

Certificate, **Structural Biology**, SSRL RapiData 2023: Data Collection and Structure Solving: A Practical Course in Macromolecular X-Ray Diffraction Measurement Structural Molecular Biology (SMB) Division, Macromolecular Crystallography, Stanford Synchrotron Radiation Lightsource (SSRL), SLAC National Accelerator Laboratory

MS, Biological Sciences (**Concentration**: Genetics, Computational Systems Immunology) California State University, East Bay and Stanford University School of Medicine
- Advisor: Prof. Michael Snyder, Prof. Garry Nolan

BS, Cell and Molecular Biology, San Francisco State University, San Francisco, CA