Daniel Joseph Gomez

Biological Sciences: Genetics, Computational Systems Biology, and Cancer Biology
Graduate Student, California State University, East Bay
Genetics, Snyder Lab, Stanford Genetics, Stanford Medicine

Address: 3165 Porter Dr
Palo Alto, CA 94304
Cell Phone: +1 (650) 201-1272
Email: djgomez@stanford.edu
Website: http://web.stanford.edu/people/djgomez

SUMMARY

Skilled Molecular Biologist & Biomedical Data Scientist/Engineer with a focus on Precision Medicine, Genomics, Cancer, Immunology, Neurology, and Computational Systems Biology/Bioinformatics. Experienced in leveraging diverse datasets to create customized functions for diagnosis, interventions, and therapeutic solutions, with specialized knowledge in spatial omics and microscopy techniques.

RESEARCH ACTIVITIES

Research Focus

1. Computational biology and predictive modeling using deep learning for precision medicine.
2. Multiomics and multi-modal omics analysis integrated with spatial mapping for comprehensive understanding.
3. Inter-cellular communication analysis and representation learning in omics data for biological insights.
4. Exerkine mapping and precision exercise medicine for optimizing fitness and health outcomes.
5. Human BioMolecular Atlas Program (HuBMAP) and Human Tumor Atlas Network (HTAN) data utilization for disease understanding.
6. Molecular Transducers of Physical Activity Consortium (MoTrPAC) insights integrated with Genotype-Tissue Expression (GTEx) Project data for predictive biomedicine.
7. Digital pathology for disease diagnosis and prognosis in multi-tissue architecture analysis.

Education and Training

Predoctoral/Graduate

2022- M.S., Biological Sciences: Genomics & Computational Biology
Department of Biological Sciences
California State University, Hayward, CA

Department of Genetics
Stanford University School of Medicine, Palo Alto, CA
(Thesis Advisor: Prof. Michael Snyder)

Research Thesis Project: *Leading a collaborative effort at Stanford University to map exercise-*

induced exerkines across organs using fusion algorithms, deep omics profiling and spatial omics. Integrate data from preclinical models and humans, analyze multi-omics datasets to collect, model, process, connect exerkines across organ architecture/tissue microenvironments, cell/molecular networks, and nuclear organization. Contribute to precision medicine by upgrading the novel multiplex imaging and analysis in intra-organ communication via spatial tissue maps with proper cell annotation, image segmentation, clustering niches into community plots, neighborships, cell types/subtypes, and advancing single-cell and spatial omics technologies. This will provide insights about how exerkines prevents, manages, and treats disease while predicting health outcomes (patient stratification, survivability).

2024- HuBMAP Visible Human MOOC
Luddy School of Informatics, Computing, and Engineering
Cyberinfrastructure Network for Science Center
Indiana University

2024 Certificate, Bioinformatics in Precision Medicine
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

2023 2nd Annual Spatial Biology Workshop (Angelo Lab)
Department of Pathology, Stanford School of Medicine

2023 Graduate Student Intern (SCI Faculty Support)
Department of Structural Biology, Department of Chemical and Systems Biology
Stanford Cancer Institute, Stanford University School of Medicine
(Advisor: Prof. Kacper Rogala)

2023 Image Processing Workshop for Cryo-Electron Microscopy
S2C2 | Stanford-SLAC Cryo-EM Center

2023 Biological cryogenic microscopy and tomography (BioE 320)
Stanford Bioengineering, Schools of Engineering & Medicine
(Advisor: Prof. Wah Chiu)

2023 Certificate, 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
(Advisor: Dr. Aina Cohen)

2012-13 Neurosciences, Neurovirology Graduate Courses
Department of Cell and Molecular Biology (CMB)

Department of Tropical Medicine, Medical Microbiology, and Pharmacology (DTMMMP), John A. Burns School of Medicine (JABSOM), Honolulu,HI
(Advisor: Prof. Dr. Bruce Shiramizu, Prof. Vivek Nerurkar)

2012 Translational Research in NeuroAIDS and Mental Health
Neuroimmune Pharmacology Graduate Course
Department of Neurology and Neurosurgery
Division of Neuroimmunology and Neurological Infections
Johns Hopkins University School of Medicine
(Advisor: Dr. Avindra Nath, Prof. Amanda Brown, Prof. Dr. Bruce Shiramizu)

Undergraduate

2020-22 B.S., Cell and Molecular Biology, San Francisco State University, CA
(Advisor: Prof. Michael Goldman, Prof. Nicole Salazar-Velmeshev)
2010-13 Molecular Cell Biology, University of Hawaii at Manoa, HI
(Advisor: Prof. Paul Patek, Prof. Dr. Bruce Shiramizu)
2008-10 Communication Studies (Honors, Sigma Chi Eta Chapter), Ohlone College, CA
2003-09 Dual Credit (Study Abroad), Modesto Junior College, CA

Professional Experience

2023- Graduate Student Researcher, Snyder Lab, Stanford Genetics
2023 Neuroimaging Data Scientist, Steinberg Lab, Stanford Neurosurgery
2023- Vice President of STEM Programs, Myplaceisahappy1 (MPH1)
2023 Graduate Student Intern, Stanford Cancer Institute (SCI), Stanford Medicine
2022-23 Visiting scientist "User", SLAC National Accelerator Laboratory
2022-23 Teaching Associate of Biological Sciences, CSU East Bay
2022 Virtual Volunteer Associate Fellow, Microbiology & Immunology, Neurobiology and Anatomy, Drexel University College of Medicine
2022 Lab Assistant II of Operations, Roche Diagnostics (Roche Molecular Systems)
2021-22 Formulations Operator II, Robotics, Thermo Fisher Scientific
2020 Research Assistant of Physiological Sciences, Toxicology, University of Florida
2019 Manufacturing Associate Technician, Custom Primers, Thermo Fisher Scientific
2018 Client Relationship Manager, Poshprofiles
2015-16 R&D Coordinator, dosist
2015 Assistant General Manager, Amoura International Inc.
2014 Research Assistant of Anesthesia/Neuroanesthesia, UCSD SoM
2013 Research Assistant of DTMMMP, JABSOM
2012-13 Biology Assistant of DTMMMP, JABSOM
2011 Teaching Assistant of Chemistry, University of Hawaii at Mānoa

SCHOLARLY PUBLICATIONS:

Peer Reviewed Publications: *Co-Authors

1. **D.J. Gomez*,** T.H. Mulherkar*, G. Sandel, P. Jain*, Co-infection and cancer: Host-Pathogen Interaction between Dendritic Cells and HIV-1, HTLV-1, and Other

Oncogenic Viruses. *Viruses*. 2022 Sep 14;14(9):2037.

2. **D.J. Gómez*.** Untangling the Microscopic World of Organelles, Cells, Tissues, and Organs: A Focus on the Dysfunctional Golgi Apparatus in Disease Research. *Biology and Life Sciences Forum*. 2023

Non peer-reviewed journal articles

1. **D. Gomez***, Pioneering Organelle Structural Biology: Golgi apparatus dysfunction in Parkinson's Disease, Neurodevelopmental Disorders, and Cancer. *Preprints*, 2022, 2022100383.
2. **D. Gomez*.** Unraveling the Structural Dynamics of Human Pegivirus-1 RNA- Dependent RNA Polymerase Using Computational Methods. *ResearchGate*, 2022.

CONFERENCE ABSTRACTS

1. **Gomez D.J.**, Mulherkar T., Sandel G., Jain P. "Co-infection and cancer: Viral oncogenesis in humans result in liver, blood, and brain cancer by host-pathogen interactions" 12th Annual American Association Cancer Research, Japanese Cancer Associate (AACR-JCA) Joint Conference. (2022)

SYMPOSIUM POSTERS

1. **Gomez D.J.**, Mulherkar T., Sandel G., Jain P. "Co-infection and Human Cancer: Viral Oncogenesis leads to Host-Pathogen-Tumor-Body Interactions" 22nd Microbiology Student Group Symposium in Krutch Theater at Clark Kerr UC Berkeley Campus (2023)

GRANTS

Prior Funding

Undergraduate Research Opportunities Program (UROP)
04/22/2013 Office of the Vice Provost for Research and Scholarship (OVPRS)
University of Hawaii at Manoa
John A. Burns School of Medicine (PI: Bruce Shiramizu)
Role: Co-Investigator
IL-17 Production in CNS by Infiltrating T Cells and Glial Cells in the HIV-1-Infected Brain

The goal of this study to gain mechanistic insights into fronto-striatal brain wiring of neuroinflammatory pathways in HIV-Associated Neurocognitive Disorders (HAND) for the purpose of overcoming translational mental health roadblocks in precision medicine.

EDUCATIONAL ACTIVITES

Teaching

Classroom Instruction

Cal State East Bay

Fall 2022	BIOL 230 (Clinical Microbiology) – 2 sections
Fall 2022	BIOL 270 (Human Anatomy & Physiology I) – 1 section

University of Hawaii at Manoa

Spring 2011	CHEM 161L (General Chemistry I Laboratory) – 2 sections

Modesto Junior College
Summer 2005 English Language – Thailand, Laos (Study Abroad)

Tutoring
2011 Private Organic Chemistry Tutor
2011 Chemistry, Biology, Organic Chemistry (Learning Emporium)

Mentoring (Advisees) — Graduate Students
2022 Daniil Mudrov, Cell and Molecular Biology, BS, CSUEB
Biochemistry, Next-generation sequencing, Pharmacogenetics
Now at MEDGENOME, Genentech, Biochemistry MS Student at St. Joseph's

Mentoring (Advisees) — Undergraduate Students
2023 Andreea Radu, Nursing Program, (CSUEB)
Premed; Pathophysiology; Pediatrics

2023 UF Minority Health Professional Mentorship Program (MHPMP)
Emmanuel Espinoza, Biochemistry, University of Florida (UF)
Inorganic chemistry; Quantitative Chemistry, Biochemistry

2022 Courtney-Jane Lopez, CNA, Pre-Nursing (CSUEB)
Clinical Microbiology; Nursing

2022 Anika Acharya, Pre-Nursing (CSUEB)
Human Anatomy and Physiology; Nursing

2022 Yongtao Guan (Pre-med, CSUEB, Ohlone College)
Clinical Microbiology; Nursing

Workshops/Seminars/Users' Meetings/Symposiums/Conferences/Series
05/24 AI in IO: Computational Immuno-oncology SITC-NCI Webinar Series
05/24 2nd Annual Stanford RNA Program Symposium, Stanford Medicine
05/24 Genomics and Personalized Medicine Symposium
04/24 Pediatric & Maternal Innovation Showcase 2024, Stanford Medicine Children's Health
03/24 Metabolic Health Center Annual Symposium, Stanford
03/24 National Institute of Mental Health (NIMH) 75th Anniversary Symposium
NIMH's symposium Amplifying Voice and Building Bridges: Towards a More Inclusive Future
11/23 IEDB Virtual User Workshop. La Jolla Institute for Immunology. Immune Epitope Database and Analysis Resource
09/23 Stanford Genetics Structural Variants and DNA Repeats
05/23 Image Processing for Cryo-EM at S2C2-Stanford-Cryo-EM Center (SLAC)
10/22 5th Annual Cal State East Bay Hack Day (Hack the Outbreak)

10/22 IEDB Virtual User Workshop. La Jolla Institute for Immunology. Immune Epitope Database and Analysis Resource. Funded by the National Institute of Allergy and Infectious Diseases (NIAID)

09/22 Predicting cancer immunotherapy response by highly multiplexed tumor imaging (Certified)

09/22 SSRL/LCLS Users' Meeting (Stanford-SLAC)

06/22 UW-Madison, 42nd Steenbock Symposium, "Opening Doors to Cryo-EM" Titan Krios G3 and G4 workshop, Cryo-electron tomography, SerialEM.

05/22 Invited Speaker, CSU Northridge, "Data-Driven Discovery of Computational Oncology and Modern Molecular Biology"

Professional Societies

2024- Society for Immunotherapy of Cancer (SITC)

2023 Genetics Society of America (GSEA)

2023- American Society of Human Genetics (ASHG)

2022- ISCB: International Society for Computational Biology

2022 ACA: The Structural Science Society

2022- American Associate for Cancer Research (AACR)

2022 Society for Neuro-Oncology (SNO)

2022 American Society for Virology (ASV)

2020 American Society Biochemistry and Molecular Biology (ASBMB)

2013- The American Association of Immunologist (AAI)

2012 Society of NeuroImmune Pharmacology (SNIP)

RECOGINITION

Invited Talks, Panels

04/23 Speaker, Grand Slam Graduate Research Presentation, "Virophysics and Structural Dynamics of HPgV-1 NS5B Using Computational Methods," Hayward, CA

03/23 Speaker, Cells 2023 Conference of MDPI/sciforum, "Pioneering organelle structural biology: Golgi apparatus dysfunction and cascades of fatal pathways in cancer," Virtual.

01/23 Speaker, Drexel Medicine, "Landscape of myeloid and astrocyte phenotypes in acute MS lesions and future technological directions," Virtual. (Jain Lab)

10/22 Speaker, Chemistry 2022: Global Virtual Summit on Chemistry & Pharmaceutical Chemistry, "Ribozyme mechanisms and Clinical Gene Therapy," Virtual.

10/22 Speaker, Cancer Webinar 2022: 5th International Webinar on Cancer Research and Oncology, "A human retrovirus in Neuro-Oncology, interventional conductome studies, and theranostics in Nuclear Medicine," Virtual.

AREAS OF EXPERTISE

Data Science & Analysis in Omics

- Biomedical Data Science
- Data Analysis
- Computational Biology
- Bioinformatics
- Bioimage Informatics
- Integration of Omics Data
- Precision Medicine
- Spatial Omics
- Single-cell Analysis
- Deep Profiling and Multiomics
- Multimodal DL/ML
- Predictive modeling
- Data integration

Biological Understanding

- Molecular Cell Biology
- Neuroscience
- Immunology
- Exercise Biology
- Physiological Sciences
- Cellular-level Understanding
- Spatial Biology
- Biomarker Discovery
- Genetics and Genomics
- Developmental Biology
- Embryology (Maternal-Fetal Interface)
- Aging
- Cancer Biology

OTHER PROFESSIONAL ACCOMPLISHMENTS

Oral Presentations

10/22	Microbiology Control, Microbiology & Immunology, Neurobiology & Anatomy, Drexel Medicine, Philadelphia, PA; **Gomez D.J.** Cancers: PCNSL outcome in EBV+/HIV Coinfection and HTLV connection in HIV/AIDS patients.
10/22	California State University, East Bay, Hayward, CA; **Gomez D.** HTLV-1: From neuroimaging to neurosurgery and biomarkers of neuroinflammation and neurodegeneration in HAM/TSP progression.
10/22	Hack the Outbreak. California State University, East Bay, Hayward, CA; **Gomez D**. PathAR.
09/22	California State University, East Bay, Hayward, CA; **Gomez D**. Deltaretrovirus: HTLV.
09/22	California State University, East Bay, Hayward, CA; **Gomez D**. "An intasome story: Structural basis of host protein hijacking in human T-cell leukemia virus integration.

Certifications

2024	Fundamentals of Data Science in Precision Medicine and Cloud Computing
2023 Course	SSRL RapiData 2023: Data Collection and Structure Solving: A Practical in Macromolecular X-Ray Diffraction Measurement (Stanford/SLAC)
2022	Predicting cancer immunotherapy response by highly multiplexed tumor imaging
2022	Cyber Security for Lab Users, SLAC National Accelerator Laboratory
2019	IRB Training

2019	Life Sciences Responsible Conduct of Research Course (RCR)
2018	Medical School Pathology (192 hours)
2017	Python for Data Science and Machine Learning Bootcamp
2017	Data Science and Machine Learning Bootcamp with R