Daniel J. Gomez

Graduate Student, Department of Biological Sciences, California State University, East Bay
Snyder Lab, Stanford Genetics, Stanford Cancer Institute, Stanford University of School of Medicine

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	Academic Portfolio: gomez-dan.github.io

TECHNICAL SKILLS

Biomedical Imaging & Image Analysis

- Immunohistochemistry (IHC) assays
- Digital Pathology
- Immunofluorescence (IF) with confocal image analysis
- In Situ Hybridization / In Situ Imaging
- Spatial Biology (Spatial Multi-Omics) Pipelines
- Pathogenomics (Histology / Genetics)
- Neuroimaging (CT, MRI, PET)
- Annotation, Segmentation, Transforms
- Community, Cell Neighborhood Analysis
- Optical Imaging (Cryo-EM, Cryo-ET, Macromolecular Crystallography)
- Single-Cell Data Science and Spatial Bioinformatics

Molecular/Biotechnology Techniques

- PCR/qPCR
- Animal Husbandry (Mus musculus)
- Molecular Cloning (Restriction Enzymes, Plasmids)
- Transformation/Transfection/Transduction
- Nanobiotechnology Protein Bioconjugation Tools Bioengineering
- Cell culture and metabolomics analysis
- Protein harvests (protein production from genome-engineered cells, select plasmids)
- Protein purification by column chromatography (affinity assays)
- Bradford assays for protein concentration
- SDS-PAGE Gel Electrophoresis
- Next-Generation Sequencing
- Attention to detail

Automation

- Robotics Operation (Hamilton Microlab Star, Bravo Velocity)
- Handle and work with biological and chemical reagents
- Space Ranger and Loupe Browser (10x Genomics)
- High-throughput platforms

Soft Skills

- Presentations
- Communication
- Work ethic
- Problem-solving
- Teamwork
- Adaptability
- Conflict management
- Time management
- Creativity
- Critical Thinking

RESEARCH ACTIVITIES
Research Emphasis
1. Interorgan communication, pathway network analysis and representation learning in omics data for biological insights and cancer knowledge networks
2. Exercise immunology high-dimensional multiplexed imaging interorgan molecular spatial omics mapping and spatiotemporal atlas construction and building
3. AI/ML, Bioinformatics and Computational Biology for precision medicine and health
4. Multiomics and multi-modal omics analysis integrated with spatial atlases and cell map for comprehensive understanding in cancer biology
5. Single-cell multiomics and spatial analysis in Human BioMolecular Atlas Program (HuBMAP) and Human Tumor Atlas Network (HTAN) data utilization for health and disease understanding of cellular and spatial architecture of TME and TLS and TIL scoring
6. Molecular Transducers of Physical Activity Consortium (MoTrPAC) insights integrated with Genotype-Tissue Expression (GTEx) Project data for predictive biomedicine
7. Multi-tissue multi-organ architecture integrative analysis of intra- & intercellular networks
8. Integrative analysis of gene circuits with PsychENCODE Consortium (PEC)

SUMMARY
Skilled and knowledgeable Computational/Systems Biology Data Scientist with a focus on single-cell spatial genomic profiling of cross-species spatiotemporal patterns in microanatomical features and structures hierarchical organization in tissue microenvironments, tumor microregions, cell-cell interactions, data science/cloud computing and AI/ML precision medicine. Experienced in machine learning, computational biology and data analysis, data integration, and translational biomedical research. Developing algorithms and tools to improve patient survivability and the interpretation of genetic data and use diverse computational tools with large datasets to implement innovative solutions for molecular diagnosis, treatment, predict outcomes with a specialty in cellular & molecular biology, single-cell and spatially resolved technologies, advanced high-definition/resolution microscopy, precision medicine, deep learning, foundational models and integrative platforms.

Education and Training
Graduate training
2022-25   **M.S., Biological Sciences** (*Anticipated May 2025*)
               Department of Biological Sciences
               California State University, Hayward, CA
               Department of Genetics
               Stanford University School of Medicine, Stanford, CA
               Stanford Cancer Institute
               (Thesis Advisor: Prof. Michael Snyder)

09/2024   Comprehensive Cancer Biology Trainee Program
               Stanford Cancer Institute
               Stanford University School of Medicine, Stanford, CA

08/2024-   Certificate, AI/ML in Precision Medicine

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

06/2024   Contextualizing Cellular Physiology Workshop
National Institute of Diabetes and Digestive and Kidney Diseases
National Institute of Health (NIH)

04/2024   HuBMAP Visible Human
Luddy School of Informatics, Computing, and Engineering
Cyberinfrastructure Network for Science Center
Indiana University

02/2024   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

08/2023   2nd Annual Spatial Biology Workshop (Angelo Lab)
Department of Pathology, Stanford School of Medicine

Summer 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
(Principal Investigator: Prof. Kacper Rogala)

05/2023   Image Processing Workshop for Cryo-Electron Microscopy
S2C2 | Stanford-SLAC Cryo-EM Center

Spring 2023 BIOE 320: Biological cryogenic microscopy and tomography
Stanford Bioengineering, Schools of Engineering & Medicine
(Professor Wah Chiu)

03-04/2023 SSRL RapiData 2023 Certificate: 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 and Event Coordinator: Dr. Aina Cohen, Clyde Smith)

2012-13   Neurosciences, Neurovirology Graduate Courses (CMB606, TRMD607)
Department of Cell and Molecular Biology
Department of Tropical Medicine, Medical Microbiology, and Pharmacology
John A. Burns School of Medicine (JABSOM), Honolulu, HI

(Advisor: <u>Bruce Shiramizu, MD</u>, <u>Vivek Nerurkar, PhD</u>)

Fall 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: <u>Avindra Nath, MD</u>, <u>Prof. Amanda Brown, PhD</u>, <u>Dr. Bruce Shiramizu)</u>

Undergraduate
2020-22   **B.S., Biology: Cell and Molecular Biology**, San Francisco State University, CA
               (Advisor: <u>Prof. Michael Goldman</u>, <u>Prof. Nicole Salazar-Velmeshev</u>)
Summer 2020 Research, Genetics, SFSU (Advisor: Scott Roy, PhD)
2010-13   Molecular Cell Biology, University of Hawaii at Manoa, HI
               (Advisor: <u>Prof. Paul Patek</u>, <u>Prof. Dr. Bruce Shiramizu</u>)
2008-10   Communication Studies (Honors, Sigma Chi Eta Chapter), Ohlone College, CA
Summer 2004 Dual Credit (Study Abroad: Thailand (English, Storytelling, Personal
               Development), Modesto Junior College, CA
2007   Diploma, Modesto High School, Modesto, CA

Professional Experience
2023-   Graduate Student Researcher, Snyder Lab, Department of Genetics, Stanford
               Cancer Institute (SCI), Stanford University School of Medicine
2023   Visiting Graduate Student Intern, Rogala Lab, Department of Structural Biology,
               Department of Chemical and Systems Biology, Stanford Cancer Institute (SCI),
               Stanford Medicine
2022-23   Visiting scientist "User", SLAC National Accelerator Laboratory
2022-23   Teaching Associate, Biological Sciences, CSU East Bay
2022-23   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, Software Developer, SDR, Poshprofiles (BAWF)
2015-16   R&D Coordinator, dosist (Previously known as hmbldt)
2014   Research Assistant of Anesthesia/Neuroanesthesia, UCSD School of Medicine
2013   Research Assistant of Department of Tropical Medicine, Medical Microbiology,
               and Pharmacology, JABSOM
2012-13   Biology Assistant of Department of Tropical Medicine, Medical Microbiology,
               and Pharmacology, John A. Burns School of Medicine (JABSOM)
2011   Teaching Assistant of Chemistry, University of Hawaii at Mānoa

SCHOLARLY PUBLICATIONS:

Peer Reviewed Publications: *Co-Authors

1. T.H. Mulherkar*, **D.J. Gomez***, 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. doi: 10.3390/v14092037. PMID: 36146843; PMCID: PMC9503663.
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; 21(1):15. https://doi.org/10.3390/blsf2023021015

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

<u>University of Hawaii at Manoa</u>
Spring 2011   CHEM 161L (General Chemistry I Laboratory) – 2 sections

<u>Modesto Junior College</u>
Summer 2005   English Language – Thailand, Laos (Study Abroad)

Tutoring
2011   Private Organic Chemistry Tutor, <u>University of Hawaii at Manoa</u>
2011   Chemistry, Biology, Organic Chemistry (Learning Emporium)

Workshops/Seminars/Users' Meetings/Symposiums/Conferences/Series
11/2024   Stanford Spatial Biology Symposium, 10x Genomics, Stanford University
11/2024   Gastric Cancer Summit 2024, National Cancer Institute, Stanford Medicine
10/2024   Spatial Biology Summit 2024, Stanford Pathology
10/2024   Giotto Suite Workshop 2024, Boston University
09/2024   Spatial Biology Summit 2024 (Angelo Lab), Stanford Pathology
09/2024   Comprehensive Cancer Biology Training Program, Stanford Cancer Institute,
                        Stanford Medicine
08/2024   Global Immunotalks 2024
06/2024   Contextualizing Cellular Physiology Workshop, NIH, National Institute of
                        Diabetes and Digestive and Kidney Diseases (NIDDK)
05/2024   AI in IO: Computational Immuno-oncology SITC-NCI Webinar Series
05/2024   2nd Annual Stanford RNA Program Symposium, Stanford Medicine
05/2024   Genomics and Personalized Medicine Symposium, Stanford Genetics
04/2024   Pediatric & Maternal Innovation Showcase 2024, Stanford Medicine, Children's
                        Health, Stanford Healthcare Center
03/2024   Metabolic Health Center Annual Symposium, Stanford
03/2024   National Institute of Mental Health (NIMH) 75th Anniversary Symposium
                        NIMH's symposium Amplifying Voice and Building Bridges: Towards a More
                         Inclusive Future
11/2023   IEDB Virtual User Workshop, La Jolla Institute for Immunology, Immune
                        Epitope Database and Analysis Resource
09/2023   Stanford Genetics Structural Variants and DNA Repeats
08/2023   Global Immunotalks 2023
08/2023   Spatial Biology Workshop 2023 (Angelo Lab), Stanford Pathology
05/2023   Image Processing for Cryo-EM at S2C2-Stanford-Cryo-EM Center (SLAC)
10/2022   5th Annual Cal State East Bay Hack Day (Hack the Outbreak)
10/2022   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)
09/2022   Predicting cancer immunotherapy response by highly multiplexed tumor
                        imaging (Certification)
09/2022   SSRL/LCLS Users' Meeting (Stanford-SLAC)

06/2022	UW-Madison, 42nd Steenbock Symposium, "Opening Doors to Cryo-EM" Titan Krios G3 and G4 Workshop, Cryo-electron tomography, SerialEM
05/2022	Invited Speaker, CSU Northridge, "Data-Driven Discovery of Computational Oncology and Modern Molecular Biology"
08/2021	Global Immunotalks 2021
08/2020	Global Immunotalks 2020

Professional Societies

2020-	The American Society for Cell Biology (ASCB)
2024-	Society for Immunotherapy of Cancer (SITC)
2023	Genetics Society of America (GSA)
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	The American Society for Cell Biology (ASCB)
2020	American Society Biochemistry and Molecular Biology (ASBMB)
2013-	The American Association of Immunologist (AAI)
2012	Society of NeuroImmune Pharmacology (SNIP)

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

RECOGINITION
Invited Talks, Panels, Seminars

| 04/2023 | Speaker, Grand Slam Graduate Research Presentation, "Virophysics and |

Structural Dynamics of HPgV-1 NS5B Using Computational Methods," Hayward, CA

03/2023	Speaker, Cells 2023 Conference of MDPI/sciforum, "Pioneering organelle structural biology: Golgi apparatus dysfunction and cascades of fatal pathways in cancer," Virtual.
01/2023	Speaker, Drexel Medicine, "Landscape of myeloid and astrocyte phenotypes in acute MS lesions and future technological directions," Virtual. (Jain Lab)
10/2022	Speaker, Chemistry 2022: Global Virtual Summit on Chemistry & Pharmaceutical Chemistry, "Ribozyme mechanisms and Clinical Gene Therapy," Virtual.
10/2022	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.

OTHER PROFESSIONAL ACCOMPLISHMENTS
Oral Presentations

10/22	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

09/2024-	Fundamentals in AI/ML for Precision Medicine, Stanford Deep Data Research Center
08/2024-	CITI Group 7: IRB BioMed/GCP Research
05/2024	Artificial Intelligence in Clinical Digital Pathology, BrightTALK
05/2024	Computational pathology & Quantitative Biomarkers of the Tumor Microenvironment, BrightTALK
02/2024	Fundamentals of Data Science in Precision Medicine and Cloud Computing, Stanford Deep Data Research Center
06/2023	Ergonomics – Computer Workstation, Stanford
04/2023	SSRL RapiData 2023: Data Collection and Structure Solving: A Practical Course in Macromolecular X-Ray Diffraction Measurement (Stanford/SLAC)
02/2023	Cells 2023 Conference, Cells MDPI

01/2023	MDPI Reviewer Certificate
10/2022	Cancer Webinar 2022
10/2022	Chemistry 2022
09/2022	Predicting cancer immunotherapy response by highly multiplexed tumor imaging
09/2022	Cyber Security for Lab Users, SLAC National Accelerator Laboratory
03/2019	IRB Training
03/2019	Life Sciences Responsible Conduct of Research Course (RCR)
06/2018	Medical School Pathology (192 hours)
06/2018	DNA Research with Biopython, Udemy
10/2017	Data Science and Machine Learning Bootcamp with R, Udemy
10/2017	Learn How To Code: Google's Go (golang) Programming Language, Udemy
09/2017	Python for Data Science and Machine Learning, Udemy