Daniel J. Gomez, B.S.

Graduate Student, Department of Biological Sciences, <u>California State University</u>, <u>East Bay</u> Genetics, <u>Snyder Lab</u>, <u>Stanford Genetics</u>, <u>Stanford Cancer Institute</u>, <u>Stanford Medicine</u> Psychiatry and Behavioral Sciences, <u>Urban Lab</u>, <u>Stanford University of School of Medicine</u>

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SKILLS

Biomedical Imaging & Image Analysis

- Immunohistochemistry (IHC) assays
- Digital Pathology
- Immunofluorescence (IF)
- In Situ Hybridization / In Situ Imaging
- Spatial Biology (Spatial Multi-Omics)
 Pipelines
- Pathogenomics (Histology / Genetics)
- Molecular/Biotechnology Techniques
 - PCR/qPCR
 - Bioinformatics analysis
 - Molecular Cloning (Restriction Enzymes, Plasmids)
 - Transformation/Transfection/Transduction
 - Nanobiotechnology Protein Bioconjugation tools
 - Cell culture
- **Automation**
 - Robotics Operation (Hamilton Microlab Star, Bravo Velocity)
 - Handle and work with biological and chemical reagents
- **Soft Skills**
 - Presentations
 - Communication
 - Work ethic
 - Problem-solving
 - Teamwork

RESEARCH ACTIVITIES Research Focus

- Neuroimaging (MRI)
- Annotation, Segmentation, Transforms
- Optical Imaging (Cryo-EM, Cryo-ET, Macromolecular Crystallography)
- Single-Cell Data Science and Spatial Bioinformatics
- 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
- Space Ranger and Loupe Browser (10x Genomics)
- High-throughput platforms
- Adaptability
- Conflict management
- Time management
- Creativity
- Critical Thinking

- 1. Interorgan communication, pathway network analysis and representation learning in omics data for biological insights
- 2. Exercise organ mapping
- 3. AI/ML, Bioinformatics and Computational Biology for precision medicine
- 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 TILs
- 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 Biology Data Scientist with a focus on spatial genomic profiling of cross-species spatiotemporal patterns in microanatomical structures, tissue microenvironments, cell-cell interactions, and precision medicine. Experienced in AI/Machine Learning, computational biology and data analysis, data integration, and translational biomedical research. Developing algorithms to improve 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

Predoctoral/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)

2024 Comprehensive Cancer Biology Trainee Program

Stanford Cancer Institute

Stanford University School of Medicine, Stanford, CA

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

| 2024 | Contextualizing Cellular Physiology Workshop National Institute of Diabetes and Digestive and Kidney Diseases National Institute of Health (NIH) | | |
|---------|--|--|--|
| 2024- | HuBMAP Visible Human 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 | <u>Image Processing Workshop for Cryo-Electron Microscopy</u> S2C2 Stanford-SLAC Cryo-EM Center | | |
| 2023 | BIOE 320: Biological cryogenic microscopy and tomography Stanford Bioengineering, Schools of Engineering & Medicine (Advisor: <u>Prof. Wah Chiu</u>) | | |
| 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: Dr. Aina Cohen) | | |
| 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: Bruce Shiramizu, MD, Vivek Nerurkar, PhD) | | |
| 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: Avindra Nath, MD, Prof. Amanda Brown, PhD, 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, 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 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. 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

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, <u>University of Hawaii at Manoa</u> | | | |
| 2011 | Chemistry, Biology, Organic Chemistry (Learning Emporium) | | | |
| Workshops/Seminars/Users' Meetings/Symposiums/Conferences/Series | | | | |
| 10/24 | Giotto Suite Workshop 2024, Boston University | | | |
| 09/24 | Comprehensive Cancer Biology Training Program, Stanford Cancer Institute | | | |
| | Stanford Medicine | | | |
| 08/24 | Global Immunotalks 2024 | | | |
| 06/24 | Contextualizing Cellular Physiology Workshop | | | |
| 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, Stanford Genetics | | | |
| 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 | | | |
| 08/23 | Global Immunotalks 2023 | | | |
| 05/23 | Image Processing for Cryo-EM at S2C2-Stanford-Cryo-EM Center (SLAC) | | | |
| 10/22 | 5 th 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 | | | |
| 03,22 | imaging (Certification) | | | |
| 09/22 | SSRL/LCLS Users' Meeting (Stanford-SLAC) | | | |
| 06/22 | UW-Madison, 42 nd 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" | | | |
| 08/21 | Global Immunotalks 2021 | | | |
| 08/20 | Global Immunotalks 2020 | | | |
| Professional S | ocieties | | | |
| 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
- Biological Understanding
- Molecular Cell Biology
- Neuroscience
- Immunology
- Exercise Biology
- Physiological Sciences
- Cellular-level Understanding
- Spatial Biology

- Spatial Omics
- Single-cell Analysis
- Deep Profiling and Multiomics
- Multimodal DL/ML
- Predictive modeling
- Data integration
- Biomarker Discovery
- Genetics and Genomics
- Developmental Biology
- Embryology (Maternal-Fetal Interface)
- Aging
- Cancer Biology

RECOGINITION

Invited Talks, Panels

| invited raiks, | raneis | |
|----------------|--|--|
| 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. | |
| | | |

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

| 2024 | CITI Group 7: IRB BioN | Med/GCP Research | |
|------|--------------------------|--|--|
| 2024 | Fundamentals in AI/ML | for Precision Medicine | |
| 2024 | Fundamentals of Data So | cience in Precision Medicine and Cloud Computing | |
| 2023 | SSRL RapiData 2023: D | SSRL RapiData 2023: Data Collection and Structure Solving: A Practical Cours | |
| | in Macromolecular X-Ra | ay Diffraction Measurement (Stanford/SLAC) | |
| 2022 | Predicting cancer immur | notherapy response by highly multiplexed tumor | |
| | imaging | | |
| 2022 | Cyber Security for Lab U | Jsers, SLAC National Accelerator Laboratory | |
| 2019 | IRB Training | | |
| 2019 | Life Sciences Responsib | le Conduct of Research Course (RCR) | |
| 2018 | Medical School Patholog | gy (192 hours) | |
| 2017 | Python for Data Science | and Machine Learning Bootcamp | |
| 2017 | Data Science and Machi | ne Learning Bootcamp with R | |
| | | | |