

CURRICULUM VITAE

Daniel Joseph Gómez Santos

Structural Biology Graduate Student of Biological Sciences

California State University, East Bay, USA
Stanford Synchrotron Radiation Lightsource (SSRL)
Linac Coherent Light Source (LCLS)
SLAC National Accelerator Laboratory, USA

and

Research Associate of Microbiology and Immunology, Neurobiology and Anatomy

College of Medicine, Drexel University, USA

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🧪 Research Interests

As a dedicated researcher, my goal is to gain admission into a Structural Biology PhD program to gain the necessary skills and knowledge to develop novel therapies for diseases using cutting-edge techniques in structural biology and bioengineering principles. Specifically, I am interested in studying the dynamics of protein structures in response to ligand binding and enzymatic reactions, and applying time-resolved structural biology techniques such as x-ray crystallography and cryogenic tomography to gain a more comprehensive understanding of protein structures. With this knowledge, I aim to contribute to the development of new and more effective therapeutics for diseases, by developing new microscope and diffraction technology. I am also fascinated by the study of organelles and their roles in cellular function and disease, and I believe that integrating nanofluidics into these techniques can lead to high-resolution imaging of organelles in live cells and enable new diagnostic and therapeutic approaches for diseases such as cancer, neurodegenerative disorders, and infectious diseases. Additionally, I am interested in organoid and organ-on-a-chip technology, as well as organelle-in-vesicle adoptive transfer techniques, as they offer unique opportunities to study the behavior of cells and tissues in a controlled environment. Overall, my research interests are centered around the application of cutting-edge techniques in structural biology and bioengineering to address the challenges of developing new therapies for diseases.

Education & Research Experiences

Current:

M.S. Biological Sciences:
Structural Molecular Biology
Graduate Student

2022/8–present, California State University, East Bay
SSRL, LCLS, S²C², SCSC
SLAC National Accelerator Laboratory

Macromolecular Structure

Non-Degree Graduate Student

2023/4–2023/6, Oregon State University
College of Science, School of Life Sciences
Department of Biochemistry and Biophysics

Research Assistant

2023/1–present, University of Florida
College of Medicine (UFCOM)
Lillian S. Wells Department of Neurosurgery
(Advisor/Co-author): Neurosurgery Resident, Brandon Lucke-Wold, MD, PhD

Research Associate

2022/6–present, Drexel University
College of Medicine (DUCOM)
Departments of Microbiology and Immunology,
Neurobiology and Anatomy
(Advisor: Pooja Jain, PhD)

Medical Neuroscience

Certificate Program

2023/3–present, Duke University
Department of Neurobiology
Department of Neurology
Department of Psychology and Neuroscience
Professor: Leonard E. White, PhD

Particle Physics: an Introduction

Certificate Program

2023/3–present, University of Geneva
Department of Nuclear and Particle Physics
Professors: Martin Pohl, PhD; Anna Sfyrlla, PhD

Getting started in Cryo-EM

Certificate Program

2023/3–present, California Institute of Technology (Caltech)
Department of Biology and Bioengineering
(Professor: Grant Jensen, PhD)

Near Future:

Physical Chemistry

Non-Degree Graduate Student

2023/8–2023/12, Oregon State University
College of Science
Department of Chemistry

Bioengineering

Non-Degree Graduate Student

Biological cryogenic electron microscopy and tomography

2023/4–2023/12, Stanford University
Schools of Engineering & Medicine
Department of Bioengineering

Past:

RapiData 2023

Data Collection and Structure Solving

Macromolecular X-Ray Diffraction Measurement

2023/3–2023/4, SLAC National Accelerator Laboratory
Stanford Synchrotron Radiation Lightsource (SSRL)
Structure Molecular Biology (SMB) program
U.S. Department of Energy (DOE) Office of Science

Stanford University

**B.S. Biology:
Cell and Molecular Biology**

2020/8–2022/5, **San Francisco State University**
College of Science & Engineering
Department of Biology
(Advisors: Nicole Salazar Velmeshev, PhD;
Michael Goldman, PhD; Scott Roy, PhD)

Research Assistant

2020/1–2020/3, **University of Florida**
College of Veterinary Medicine (UFCVM),
Department of Physiological Sciences
(Advisors: Chris Vulpe, MD, PhD; Rola Zeidan, PhD)

R&D Coordinator

2015/12–2016/3, **dosist**

Research Assistant

2014/1–2014/6, **UCSD School of Medicine,**
VA San Diego Health Care,
Department of Anesthesia, Division of Neuroanesthesia
(Advisors: Hemal Petal, PhD; Jan Schilling, MD; Brian Head, PhD)

**Graduate Coursework
Neurosciences, Neurovirology**

2012/8–2013/6, **John A. Burns**
School of Medicine (JABSOM)
University of Hawaii at Manoa
Department of Tropical Medicine,
Medical Microbiology, and Pharmacology (DTMMMP)

Johns Hopkins University
School of Medicine (JHUSOM),
Department of Neurology and Neurosurgery,
Division of Neuroimmunology and Neurological Infections
(Professors: Martin Rayner, PhD; Bruce Shiramizu, MD; Vivek Nerurkar, PhD; Linda Chang, MD; Amanda Brown, PhD, Avindra Nath, MD)

Research Assistant

2012/8–2013/7, **JABSOM, DTMMMP**
(Advisors: Bruce Shiramizu, MD; Vivek Nerurkar, PhD)

Molecular Cell Biology

2010/8–2013/6, **University of Hawaii at Manoa**
Department of Microbiology
(Advisor: Paul Patek, PhD)

Positions & Employment

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| 2023- | Founder, Structural Molecular Biologist, Structure Universe LLC |
| 2023- | Director of Multiomics, Biomedical Research Engineering-Scientist (ML Scientist/AI Engineer), Gomera Health |
| 2023- | Head of Neuroinformatics and Clinical Biomarkers Program, GomeBio |
| 2023- | VP of STEM Programs, Myplaceisahappy1 (MPH1) |
| 2023- | Research Assistant (co-author), Department of Neurosurgery, UF College of Medicine (Dr. Hoh's Cerebrovascular Research Lab) |
| 2023- | Expert Consultant, Coleman Research |
| 2023- | Chairman, President, Gome Writings Inc, (" Gome-Writer ") |
| 2023- | CEO, Director, Gomera Health Inc. (" Gomera ") |
| 2022- | Founder/Chief Executive Officer, Gome Bio LLC (" GomeBio ") |
| 2022- | Founding Board Member, Myplaceisahappy1 (MPH1) |
| 2022 | Teaching Associate, Department of Biological Sciences, College of Science, California State University, East Bay |
| 2022- | Graduate Student Researcher, Department of Biology, CSUEB |
| 2022- | Visiting scientist"user", SLAC National Laboratory |
| 2022- | Research Associate, Department of Microbiology & Immunology, Neurobiology and Anatomy, Drexel University College of Medicine (DUCOM) |
| 2022 | Lab Assistant II/Production Supervisor, Roche Diagnostics (RTD) |
| 2022 | Person of Interest, Stanford-SLAC Cryo-EM Center (S ² C ²) |
| 2021-22 | Formulations Operator II, TAPP Robotics, Thermo Fisher Scientific |
| 2021 | Staff Research Assistant, Department of Bioengineering and Therapeutic Sciences, University of California, San Francisco (UCSF) |
| 2020-21 | Research Assistant, Department of Biology, SFSU |
| 2020 | Research Assistant, Department of Physiological Sciences, Toxicology, University of Florida College of Veterinary Medicine (UFCVM) |
| 2019 | Manufacturing Associate I, Custom Primers, Thermo Fisher Scientific |
| 2018 | Client Relationship Manager, Software Developer, PoshProfiles (BAWF) |
| 2015-16 | R&D Coordinator, hmbldt/dosist |
| 2015 | Assistant General Manager, Amoura International |
| 2014 | Research Assistant, Department of Anesthesia, Division of Neuroanesthesia, UCSD School of Medicine, VA Hospital |
| 2013 | Research Associate, DTMMMP, JABSOM, UHM |
| 2012-13 | Biology Assistant, DTMMMP, JABSOM, UHM |
| 2011 | Teaching Assistant, Department of Chemistry, UHM |

Honors & Awards

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| 2022 | Faculty Member, Graduate, Department of Biological Sciences, CSUEB |
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2020 DiVERGE Awardee, Scripps Research Institute
2013 Grant Awardee, Undergraduate Research Opportunity Program (UROP), UHM

Editorial Team

Academic Editor

- *Cancers: Neuro-oncology and neurotrauma*

Editorial Board Member

- *Bioengineering*

Journal Referee

- *Biology*
- *Cancers*
- *Cells*
- *Healthcare*
- *International Journal of Molecular Sciences (IJMS)*
- *Pharmaceuticals*
- *Viruses*

First/Co-first Author Publications

+:Co-first Author. *: Co-Corresponding Author

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

D.J. Gomez, G. Sandel, R. Kulkarni, J. Joseph, S. Maher, P. Jain*. **Epitope-Based Vaccines and Immunotherapy for Infection-Related Cancers in People Living with HIV: Current Status, Challenges, and Future Directions.** *Frontiers in Microbiology*. 2023 (In preparation)

D.J. Gomez-Santos* and M. Borja. **Ribozymes as Precision Weapons: Revolutionizing Gene Therapy for Incurable Diseases.** *International Journal of Molecular Sciences*. 2023 (In preparation)

D.J. Gomez*. Immunoreagent Design and Production in Vaccine Development: Rational Design, High-Throughput Production, and Integration of Structure and Computation. *Vaccines*. 2023 (In preparation)

D.J. Gomez-Santos, B. Lucke-Wold*. **Neuroendovascular embolization procedure optimization for aneurysm subarachnoid hemorrhage healing by drug eluting biomedical devices, robotics, and artificial intelligence.** *Bioengineering*. 2023 (In preparation)

D. Gomez*. **Unraveling the Structural Dynamics of Human Pegivirus-1 RNA-Dependent RNA Polymerase Using Computational Methods.** *ResearchGate* 2022. DOI: [10.13140/RG.2.2.11957.35041](https://doi.org/10.13140/RG.2.2.11957.35041)

D. Gomez*, **Pioneering Organelle Structural Biology: Golgi apparatus dysfunction in Parkinson's Disease, Neurodevelopmental Disorders, and Cancer.** *Preprints*, 2022, 2022100383. doi: [10.20944/preprints202210.0383.v2](https://doi.org/10.20944/preprints202210.0383.v2).

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](https://doi.org/10.3390/v14092037). PMID: 36146843; PMCID: PMC9503663.

Oral Presentations

Immunoreagent Design and Production in Vaccine Development: Rational Design, High-Throughput Production, and Integration of Structure and Computation, 2023/06, Virtual meeting. Vaccines Research 2023 eConference (Vaccines-eCon2023). The Research Catalyst.

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

Landscape of Myeloid and Astrocyte phenotypes in acute MS lesions + Future Technological Directions, 2023/01, Virtual presentation. Drexel University College of Medicine, Department of Microbiology and Immunology, Neurobiology and Anatomy. (Jain Lab)

Structure-based discovery of RdRp NS5B in HPgV (GBV-C) by macromolecular crystallography (MX), 2022/12, In-person & Virtual presentation. Cell and Molecular Biology Seminar: CSU East Bay.

Retron Library Recombineering (RLR): Going beyond CRISPR, 2022/11, In-person & Virtual presentation. Cell and Molecular Biology Journal Club: CSU East Bay.

Ribozyme mechanisms and Clinical Gene Therapy, 2022/10, Virtual meeting. Chemistry 2022, Global Virtual Summit on Chemistry & Pharmaceutical Chemistry.

A Human Retrovirus in Neuro-Oncology, Interventional Conductome Studies, and Theranostics

in Nuclear Medicine, 2022/10, Virtual meeting. 5th International Webinar on Cancer Research and Oncology.

Cancers: PCNSL outcome in EBV+/HIV Confection and HTLV connection in HIV/AIDS patients, 2022/10, Virtual presentation. Drexel University College of Medicine, Department of Microbiology and Immunology, Neurobiology and Anatomy. (Jain Lab)

HTLV-1: From neuroimaging to neurosurgery and biomarkers of neuroinflammation and neurodegeneration in HAM/TSP progression, 2022/10, Virtual seminar. Cell and Molecular Biology Seminar: CSU East Bay.

Hackathon “Hack the Outbreak”: PathAR, 2022/10, In-person & Virtual presentation. CSU East Bay.

An intasome story: Structural basis of host protein hijacking in human T-cell leukemia virus integration, 2022/09, Virtual seminar. Cell and Molecular Biology Seminar: CSU East Bay.

Deltaretrovirus: HTLV, 2022/09, Virtual seminar. Cell and Molecular Biology Seminar: CSU East Bay.

Data Driven Discovery of Computational Oncology and Modern Molecular Biology, 2022/5, Virtual seminar. Data Science Research and Career Seminar: CSU Northridge.

Poster Presentations

Design and Evaluation of an Epitope-based Universal Vaccine Targeting SARS-CoV-2 Nucleocapsid (N), PLpro, and Mac1 of Nsp3, 2023/4, Berkeley, CA. 22nd Annual UC Berkeley Microbiology Student Symposium.

Co-infection and cancer: Viral oncogenesis in humans result in liver, blood, and brain cancer by host-pathogen interactions, 2022/12, Honolulu, HI. 12th Annual American Association for Cancer Research (AACR) - Japanese Cancer Associate (JCA) Joint Conference.

Teaching, Training, Mentoring Experience

University Service (University of Florida)

2023- UF MHPMP mentor, Minority Health Professional Mentorship Program (MHPMP),
Pre-Health Club

Instructional Activities (CSUEB)

Fall 2022 BIOL230 (Clinical Microbiology), (4 unit course) - 2 sections
Fall 2022 BIOL270 (Human Anatomy & Physiology I), (4 unit course) - 1 section

Instructional Activities (University of Hawaii)

Spring 2011 CHEM161L (General Chemistry I Laboratory), (1 unit course) - 2 sections

University Service (University of Hawaii)

2011 Tutor, Chemistry, Biology, Organic Chemistry (Emporium)

University Service (Modesto Junior College)

2005 Teacher, English Language; Thailand, Laos (Study Abroad)

Interns

2023- Salma Maher, CMB & Physical Biochemistry Intern at Gomera Health Inc.
2022 Chier Hu, PhD, Computer Engineer Intern at Gome Bio LLC

Undergraduate Student Mentees

2023- Emmanuel Espinoza, Biochemistry, University of Florida (UF)
2022 Courtney-Jane Lopez, CNA, CSUEB, Pre-Nursing
2022 Daniil Mudrov, CSUEB, Cell and Molecular Biology (RA, MEDGENOME > Genentech)
2022 Yongtao Guan, CSUEB, Ohlone College, Pre-med (MCB)
2022 Arielle Vue, CSUEB, Pre-Nursing

Volunteering

Professional Service

2023- Editorial Board Member, *Bioengineering* MDPI,
2023- Academic Editor, *Cancers* MDPI, Special Issue: Neuro-oncology and neurotrauma
2022- Founding Board Member, VP of STEM Programs, Myplaceisahappy1 (MPH1)
2022- Volunteer Reviewer (VR), MDPI
2012 Volunteer, Physician Shadowing, Dr. Thomas Slavin, Pediatrics and Clinical Genetics, Medical Genetics section, City of Hope

Community Service

2022 Volunteer, St. Michael's Church
2022 Lighting Designer, Fountain Church
2014 Market Research, Berkeley Human Society
2014 Community Wellness Advocate, American Cancer Society
2014 Anesthesiology Technician, VA San Diego Health Care, VA Medical-Center

University Service (University of Florida)

2019-20 Scientific Ambassador, Microbiology

University Service (University of Hawaii)

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

Certifications & Licensure

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| 2023 (<i>pending</i>) | Deep Learning with PyTorch for Medical Image Analysis |
| 2023 (<i>pending</i>) | Reinforcement Learning beginner to master - AI in Python |
| 2023 (<i>pending</i>) | Modern Artificial Intelligence Masterclass: Build 6 Projects |
| 2023 (<i>pending</i>) | Deep Learning: Convolutional Neural Networks (CNN) in Python |
| 2023 (<i>pending</i>) | A deep understanding of deep learning (DL) |
| 2023 | The Complete Quantum Computing Course |
| 2023 | Scientific Computing with NumPy - Python Data Science |
| 2023 | Writing High Performance Python |
| 2023 | Database Design |
| 2023 | Beginning C++ Programming - From Beginner to Beyond |
| 2023 | Complete linear algebra: theory and implementation in code |
| 2023 | Reviewer Certificate (MDPI Journal - <i>Biology, Cancers, Pharmaceuticals, IJMS, Viruses, Cells, Healthcare</i>) |
| 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 – Certificate of Achievement |
| 2018 | Modern Golang Programming, Packt Publishing |
| 2018 | Learning Path: Go: Building Cloud Native Go Applications, Packt |
| 2018 | Mastering Go Programming, Packt Publishing |
| 2017 | DNA Research with Biopython |
| 2017 | Data Science and Machine Learning Bootcamp with R |
| 2017 | Google's Go (golang) Programming Language |
| 2017 | Python for Data Science and Machine Learning |
| 2016 | Intro to SQL for Data Science Course - DataCamp |

Professional Trainings & Workshops

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| 2023 | Vaccine Technology Workshop. World Vaccine Congress, Washington, DC. |
| 2023 | HIV Workshop. World Vaccine Congress, Washington, DC. |
| 2023 | Biodefense: Vaccines & Antibodies. World Vaccine Congress, Washington, DC. |

- 2023 RapiData 2023 at SSRL: Data Collection and Structure Solving: A Practical Course in Macromolecular X-Ray Diffraction Measurement, SLAC National Accelerator Laboratory, Stanford Synchrotron Radiation Lightsource (SSRL), SMB, U.S. Department of Energy, Office of Science
- 2022 5th Annual Cal State East Bay Hack Day (Hack the Outbreak): Created an AR prototype of a epitope based measles vaccine to MV-H:SLAM fusion
- 2022 The Upside of Downturns Summit, Startup Grind Silicon Valley, SF Bay Area
- 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)
- 2022 SSRL/LCLS Users' Meeting | Stanford-SLAC National Accelerator Laboratory
- 2022 Stanford-SLAC Cryo-EM Center (S²C²), SCSC – Training on Electron Microscopes and Computers (Under the direction of Wah Chiu), cryo-FIB/SEM milling
- 2022 UW-Madison, Department of Biochemistry, 42nd Steenbock Symposium, Opening Doors to Cryo-EM, Titan Krios G3 and G4 workshop, Cryo-electron tomography, SerialEM

Technical Strength

Languages: English (Native), Spanish (Communicative), Arabic (Novice), Hebrew (Beginner)

Skills: Strong background in biology, biochemistry, and/or biophysics. Knowledge of protein structure and function, as well as other biomolecules such as nucleic acids and carbohydrates. Familiarity with experimental techniques used in structural biology, such as x-ray crystallography, NMR spectroscopy, electron microscopy, hybrid structural mass spectrometry (HDX-MS, etc), and computational modeling. Ability to perform protein expression, purification, and characterization, including chromatography, electrophoresis, and spectrophotometry. Competence in computer programming and data analysis, as well as experience with data visualization and statistical analysis, Familiarity with laboratory safety protocols and good laboratory practices, including handling of hazardous materials and biological samples. Strong problem-solving and critical thinking skills, including the ability to troubleshoot experimental issues and design creative solutions. Excellent communication and collaboration skills, including the ability to work effectively in a team environment and to present research findings to diverse audiences.

Digital Proficiency: Benchling, Photoshop, Illustrator, Biorender, Linux, GitHub, Shell scripting, Shiny

Programming Languages: Go  , R  , Python  , C++  , HTML, MATLAB, Bash.

Bioinformatic Tools and Databases: BioPerl, Biopython, IGV, APE, BLAST, Bedtool, Bioconductor, RNAseq, scRNAseq, Seurat, 10X Genomics pipelines, Proteomics, The Cancer Genome Atlas (TCGA), nucamino, COSMIC, Roche Cancer Genome Database (RCGDB)

References

Professor Amanda Brown

Neurovirology Professor and Director, Advisor
Associate Professor of Neurology and Neuroscience
Department of Neurology - Neuroimmunology and Neurological Infections, Neuroscience Johns Hopkins Medicine
Phone number: +1 (410) 614-2429
Email: abrown76@jhmi.edu

Professor Michael Goldman

Genetics & Honors Genetics Professor and Advisor
Former Chair, Department of Biology, San Francisco State University
Phone number: +1 (415) 388-7671
Email: goldman@sfsu.edu

Avindra Nath, M.D.

Professor, Advisor
Senior Investigator, Section of Infections of the Nervous System
Clinical Director, NINDS/NIH
Phone number: +1 (301) 496-1561
Email: natha@mail.nih.gov

Professor Nicole Salazar Velmeshev

Cancer Biology Professor and Advisor
Assistant Professor, Department of Biology, San Francisco State University
Phone number: +1 (415) 388-1184
Email: nsave@sfsu.edu