

## CURRICULUM VITAE

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### **Daniel Joseph Gómez Santos**

**Director of Multiomics, ML Scientist/AI Engineer, Gomera Health Inc.**

*and*

**Virophysics and Structural Biochemistry Graduate Student of Biological Sciences**

**California State University, East Bay, USA**

**Stanford Synchrotron Radiation Lightsource (SSRL)**

**SLAC National Accelerator Laboratory, USA**

*and*


**Neuroendovascular Researcher of Neurosurgery**

**College of Medicine, University of Florida, USA**

*and*

**Research Associate of Microbiology and Immunology, Neurobiology and Anatomy**

**College of Medicine, Drexel University, USA**

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### **Research Interests**

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- Neuroimaging, Bioimage Informatics, Clinical Neuroimmunology and Neurovirology, Neurodegeneration, Conductome, Connectome, Graph theoretical analysis, Whole brain modeling, recovery prediction, Digital Neuropathology Data Processing Algorithms and Software Development, Quantum (Neuro)biology, Immunology, Vaccinomics, Computation, Neurophysics
- Biomedical Machine Learning Engineering, Multi-omics, Pathology Informatics
- Molecular Biophysics: Macromolecular crystallography (MX), cryo-EM/ET and biochemical, biophysical and cellular techniques to (re)solve and invent novel molecular nanomachines (MNMs), nanomotors, Biological and Light-powered nanomotors, and immunoreagents
- Therapeutic Medical Physics, Diagnostic Imaging Medical Physics, and Nuclear Medicine
- Molecular Therapy, Nucleic Acids, Oncolytics, Methods & Clinical Development
- Translational science, next-generation biotechnology, synthetic biology, bioengineering
- Molecular design, tissue and organ design, gene writing, synthetic development
- Mini-Organs, organoid technology and drug development, molecular therapy (gene & cell)
- Structural Biochemistry, Structural Virophysics, and Structural Vaccinology (SV)
- Next-generation vaccines including epitope-based vaccine design and immunotherapeutics, computational vaccinology, and AI/ML/DL frameworks and platforms
- Epitope-coated nanoparticles, epitope-based vesicles, epitope grafting to protein scaffolds
- Radiology, Radiation Oncology, Radiotherapy, Proton and Photon Beam Radiation Therapy
- Neuroendovascular research in cerebrovascular diseases such as subarachnoid hemorrhage (SAH), AI in Neurosurgery, CorPath GRX robotics during coil embolization, metastatic brain tumors

## Education & Research Experiences

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### **Biomedical Neuroscience**

*Graduate Certificate Program*

*(Anticipated) 2023/8–2024/12, University of Florida*

**College of Medicine (UFCOM)**

**Department of Neuroscience**

### **Bioengineering**

*Non-Degree Graduate Student*

*(Anticipated) 2023/4–2023/12, Stanford University*

**Schools of Engineering & Medicine**

**Department of Bioengineering**

### **Medical Microbiology and Biochemistry**

*Non-Degree Graduate Student*

*(Anticipated) 2023/7–2024/1, University of Florida*

**College of Agriculture and Life Sciences**

**Department of Microbiology and Cell Science**

### **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**

**Stanford University**

### **Research Assistant**

*2023/1–present, University of Florida*

**College of Medicine (UFCOM)**

**Lillian S. Wells Department of Neurosurgery**

(Advisor (PI)): Brian Hoh, MD, MBA, FACS, FAHA, FAANS;

Associate Scientist: Koji Hosana, PhD;

Neurosurgery Resident: Brandon Lucke-Wold, MD, PhD)

### **M.S. Biological Sciences:**

**Virophysics, Molecular and Structural Biochemistry.**

*Biotechnology Certificate Program (BCP)*

*SMB program: RapiData 2023 at SSRL*

*2022/8–present, California State University, East Bay*

**SSRL, SLAC National Laboratory**

**UCSF Crystallography Facility**

Thesis Committee: Aina Cohen, PhD (Stanford),

James Hurley, PhD (UC Berkeley),

Chris Baysdorfer, PhD (CSUEB), Monika Sommerhalter, PhD (CSUEB)

Thesis Advisor: Kenneth Curr, PhD (CSUEB)

### **Research Associate**

*2022/6–present, Drexel University*

**College of Medicine (DUCOM)**

**Departments of Microbiology and Immunology,**

**Neurobiology and Anatomy**

(Advisor: Pooja Jain, PhD)

**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**

*2013/6–2012/8, 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**

**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–	Director of Multiomics, Biomedical Research Engineering-Scientist (ML Scientist/ AI Engineer), Gomera Health
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2023-	Head of Department, Department of Multi-omics Structural Biology and Network Physiology, 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, (" <a href="#">Gome-Writer</a> ")
2023-	CEO, Director, Gomera Health Inc. (" <a href="#">Gomera</a> ")
2022-	Founder/Chief Executive Officer, Gome Bio LLC (" <a href="#">GomeBio</a> ")
2022-	Founding Board Member, Myplaceisahappy1
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 <sup>2</sup> C <sup>2</sup> )
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
2020	DiVERGE Awardee, Scripps Research Institute
2013	Grant Awardee, Undergraduate Research Opportunity Program (UROP), UHM

## Editorial Team

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Academic Editor

- *Cancers: Neuro-oncology and neurotrauma*
- *Cancers: Diagnostic imaging in lung cancer*

Editorial Board Member

- *Bioengineering*

## Journal Referee

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- *Pharmaceuticals*
- *Cancers*
- *International Journal of Molecular Sciences*
- *Viruses*
- *Cells*
- *Healthcare*

## First/Co-first Author Publications

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

**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**, B. Lucke-Wold, K. Hosaka, B. Hoh\*. Neuroendovascular embolization procedure optimization for aneurysm subarachnoid hemorrhage healing by drug eluting biomedical devices, robotics, and artificial intelligence. *Bioengineering*. 2023 (In preparation)

**D. Gomez**, G. Sandel, R. Kulkarni, J. Joseph, P. Jain\*. Epitope discovery, structure-based antigen design, and immunotherapy applications against infectious diseases and cancer. (In preparation)

**D. Gomez\*** and M. Borja. Ribozymes Reaction Mechanisms: From Structural Insights to Applications in Clinical Gene Therapy for Cancer, Brain Disorders, and Infectious Diseases. *International Journal of Molecular Sciences*. 2023 (In preparation)

**D.J. Gomez\***. Structural Predictions of HPgV-1 (NS5B). *ResearchGate* 2022.

**D. Gomez<sup>\*</sup>, 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<sup>+</sup>, **D.J. Gomez<sup>+</sup>**, G. Sandel, P. Jain<sup>\*</sup>, **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

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**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.

**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

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**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

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### *University Service (California State University, East Bay (CSUEB))*

2023- Tutor, Genetics

### *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**

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### ***Professional Service***

2023- Academic Editor, *Cancers* MDPI, Special Issue: Diagnostic imaging and lung cancer

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>Cancers</i> , <i>Pharmaceuticals</i> , <i>IJMS</i> , <i>Viruses</i> , <i>Cells</i> , <i>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 (S<sup>2</sup>C<sup>2</sup>), SCSC – Training on Electron Microscopes and Computers (Under the direction of Wah Chiu), cryo-FIB/SEM milling
- 2022 UW-Madison, Department of Biochemistry, 42<sup>nd</sup> Steenbock Symposium, Opening Doors to Cryo-EM, Titan Krios G3 and G4 workshop, Cryo-electron tomography, SerialEM

## Technical Strength

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**Languages:** English (Native), Spanish (Communicative).

**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)

**Other Skills:** Benchling, Photoshop, Illustrator, Biorender, Linux, GitHub, Shell scripting, Shiny, Communication, Time management, Problem solving, Listening, Critical thinking, Collaboration, Leadership

## References

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### 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](mailto: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](mailto: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](mailto: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](mailto:nsave@sfsu.edu)