

## CURRICULUM VITAE

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### Daniel Joseph Gomez

#### Graduate Student (Master's Level) of *Structural Oncology*

Department of Biological Sciences  
California State University, East Bay, Hayward, CA, USA

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Department of Structural Biology  
Department of Chemical and Systems Biology  
Stanford University School of Medicine, Palo Alto, CA, USA  
Stanford Cancer Institute, Stanford, CA, USA

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### 🧪 Research Interests and Pursuits

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As an advanced structural biology graduate student, my research interests and pursuits encompass the integration of structural biology and oncology, with a specific focus on the field of Structural Oncology. I am driven by the goal of capturing bioimages of macromolecules involved in cancer hallmarks, elucidating their structural characteristics and unraveling the molecular intricacies underlying tumorigenesis. By employing advanced techniques such as CryoEM, I aim to obtain near atomic resolution structures, shedding light on the interplay of nutrient-sensing, nutrient-trafficking, and cancer signaling pathways.

Simultaneously, I am passionate about the innovation and application of FIB-SEM-iFLM systems within the realm of structural biology. These cutting-edge imaging techniques offer the potential for high-resolution, three-dimensional insights into the architecture and dynamics of biological macromolecules. By interfacing with lab members, I actively contribute to the development and refinement of advanced FIB-SEM-iFLM and CryoET methods. Additionally, I play a vital role in the establishment and maintenance of an efficient analysis pipeline for tomographic reconstruction.

In pursuit of scientific advancement, I independently conduct portions of research projects, offering valuable recommendations on experimental design and research direction. I possess the analytical skills to interpret and analyze results, even in situations with limited guidelines, allowing for necessary modifications to existing procedures and protocols. Moreover, I endeavor to develop new research protocols where appropriate protocols are absent from the literature or when modification/adaptation of standard procedures is required.

Actively participating in multidisciplinary collaborations across different faculties or schools, I recognize the significance of diverse perspectives in scientific progress. Through these collaborations, I contribute substantively to the preparation of papers for publication, particularly emphasizing the results section. I also seize opportunities to present ongoing work to colleagues and academic conferences, promoting the dissemination of knowledge and fostering scientific dialogue.

Ultimately, my overarching goal is to inspire structural oncologists and medicinal chemists by providing mechanistic insights and contributing to the development of novel small molecules and effective drugs to

prevent and combat various types of cancers. Specifically, I aim to target sporadic, infection-related, and familial cancers, making significant contributions to the prevention and treatment of these devastating diseases. In summary, as an advanced structural biology graduate student, I am deeply committed to the integration of structural biology and oncology. My research pursuits involve capturing bioimages of macromolecules implicated in cancer hallmarks, advancing the understanding of tumorigenesis. Additionally, I actively contribute to the innovation and application of FIB-SEM-iFLM systems, striving for high-resolution imaging and comprehensive structural investigations. Through my work, I aim to inspire scientists in the field, publish impactful findings, and actively engage in scientific collaborations and conferences.

## Education & Research Experiences

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### ***Current:***

#### **M.S. Structural Biology**

*2022/8–present*, California State University, East Bay  
Department of Structural Biology  
Stanford University School of Medicine  
Stanford Cancer Institute

#### **Molecular Biophysics I: 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  
(Professor: Victor Hsu, PhD)

#### **Bioengineering**

*Biological cryogenic electron microscopy and tomography.*

*2023/4–2023/12*, Stanford University  
Schools of Engineering & Medicine  
Department of Bioengineering  
(Professor: Wah Chiu, 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)

#### **Virtual Associate Fellow**

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

### ***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:**

*2020/8–2022/5*, San Francisco State University

## Cell and Molecular Biology

**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, **hmbldt/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)**  
(Professors: Martin Rayner, PhD; Bruce Shiramizu, MD;  
Vivek Nerurkar, PhD; Linda Chang, MD)

**Johns Hopkins University School of Medicine (JHUSOM)**  
**Department of Neurology and Neurosurgery**  
**Division of Neuroimmunology and Neurological Infections**  
(Professors: 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-	Graduate Student Intern, Department of Structural Biology, Stanford University School of Medicine, Stanford Cancer Institute
2023-	VP of STEM Programs, Myplaceisahappy1 (MPH1)
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 (MPH1)

2022	Teaching Associate, Department of Biological Sciences, College of Science, California State University, East Bay
2022	Graduate Student Researcher, Department of Biology, CSUEB
2022-23	Visiting scientist "User", SLAC National Accelerator Laboratory
2022-	Virtual Associate Fellow, 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

## Poster Presentations

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**Co-infection and Human Cancer: Viral Oncogenesis leads to Host-Pathogen-Tumor-Body Interactions**, 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.

## 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.

**Unraveling the Structural Dynamics of HPgV-1 NS5B Using Computational Methods.** Grand Slam Graduate Research Presentation Competition, Cal State East Bay Grand Slam 2023, CSU East Bay.

**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.

**PathAR** 6th Annual Cal State East Bay Hack Day, Hack the Outbreak, CSU East Bay, *Hackathon, and oral presentation*

**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.

## Journal Referee

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

## First/Co-first Author Publications

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+: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 Cellular and Infection Microbiology*. 2023 (In preparation)

**D.J. Gomez-Santos**, B. Lucke-Wold, P. Habib. **Neuroendovascular embolization procedure optimization for aneurysm subarachnoid hemorrhage healing by drug eluting biomedical devices, robotics, and artificial intelligence**. 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<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.

## Teaching, Training, Mentoring Experience

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### *University Service (University of Florida)*

Spring 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***

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***

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	SSRL RapiData 2023: Data Collection and Structure Solving: A Practical Course in Macromolecular X-Ray Diffraction Measurement SLAC SSRL
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	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), French (Novice), Arabic (Novice), Hebrew (Beginner)

### Learning Structural Biology Skills (Have and To-be Acquired):

1. **CryoEM:** Proficient in the principles, techniques, and instrumentation of CryoEM for high-resolution imaging of macromolecular structures in their native state. Desired experience in sample preparation, grid handling, data acquisition, and image processing using software such as RELION or cryoSPARC.
2. **CryoET:** Skilled in the use of CryoET for three-dimensional tomographic reconstruction of biological specimens. Familiarity with data acquisition, tilt series alignment, fiducial marker tracking, and subtomogram averaging techniques. Proficient in software packages such as Amira, IMOD or Dynamo for data processing and visualization.
3. **FIB-SEM-iFLM:** Expertise in the operation, optimization, and maintenance of FIB-SEM-iFLM systems for correlative light and electron microscopy studies. Knowledge of FIB milling, SEM imaging, and fluorescence microscopy techniques. Ability to integrate and align multimodal imaging data for comprehensive structural analysis.
4. **Sample Preparation:** Skilled in preparing biological samples for CryoEM and CryoET, including vitrification techniques, optimization of ice thickness, and specimen handling. Experience in optimizing sample conditions to preserve structural integrity and maximize imaging quality.
5. **Image Processing:** Proficient in image processing and data analysis techniques for CryoEM and CryoET, including 2D and 3D image reconstruction, particle picking, refinement, and model building. Familiarity with software tools such as RELION, cryoSPARC, IMOD, or Dynamo for data processing and visualization.
6. **Molecular Modeling:** Knowledge of molecular modeling and visualization software (e.g., Chimera, Coot, Moorhen.org, PyMOL) for interpreting CryoEM and CryoET reconstructions, fitting atomic models, and generating publication-quality figures.
7. **Instrumentation:** Strong understanding of the principles and operation of CryoEM, CryoET, and FIB-SEM-iFLM instrumentation, including electron microscopes, detectors, cryo-specimen holders, and ion beam milling systems. Proficient in troubleshooting instrument-related issues and performing routine maintenance tasks.
8. **Computational Skills:** Proficient in programming languages such as Python, MATLAB, or R for data analysis, automation of workflows, and custom script development. Familiarity with scripting in the context of image processing, statistical analysis, and data visualization.
9. **Analytical Skills:** Strong analytical and problem-solving abilities to interpret complex structural data, identify artifacts or inconsistencies, and implement appropriate corrective measures. Ability to analyze and extract meaningful information from large datasets.
10. **Collaboration and Communication:** Excellent interpersonal and communication skills to effectively collaborate with multidisciplinary teams, present research findings, and contribute to scientific publications and conferences. Ability to work both independently and collaboratively in a research environment.
11. **Project Management:** Strong organizational skills to manage multiple projects simultaneously, meet deadlines, prioritize tasks, and coordinate resources effectively. Ability to make informed decisions, plan experiments, and adapt research strategies based on results and evolving project requirements.

12. ***Safety and Compliance***: Knowledge of laboratory safety protocols and procedures to ensure compliance with health and safety regulations in working with cryogenic materials, ion beams, and other hazardous materials.

**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)