

# Sebastian Franco Ulloa, Ph.D.

## Computer Scientist

With 7 years of programming experience and a Ph.D. in biocomputational sciences, I specialize in developing AI-powered pipelines to democratize data through streamlined ingestion, analysis and visualization. My past positions as an AI engineer, data scientist and bioinformatician have honed my skills in statistical modeling, industrial software development, cloud computing and project/team management. I thrive in spaces where I can learn new technologies and spar ideas with my colleagues. I approach challenges with an analytical and compassionate mindset, actively seeking diverse perspectives to make well-informed decisions. I describe myself as a determined problem solver with a sense of humor, while my peers see me as disciplined, goal-oriented and caring.



### Contact

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### Skills

Statistical analysis

Machine learning

Data visualization

Team management

Storytelling

Teaching

### </> Programming

Python

DBT/SQL

GCP/AWS

Terraform

Docker

Apache Airflow

Apache Beam



### Languages

Spanish

English

Norwegian

Italian



### Work Experience

#### Senior Software Engineer

*Nykode Therapeutics. Norway.*

Now  
2026

Led development and deployment of scalable computational software and bioinformatics pipelines (Python, SQL) for vaccine design and neoantigen discovery on AWS. Translated research prototypes into production-grade Python algorithms within internal platforms. Optimized AWS-based research infrastructure, including HPC environments and secure handling of sensitive patient data. Deliver and documented GxP-compliant, validated software.

#### Senior AI Engineer

*DN Media Group. Norway.*

2026  
2025

Designed, implemented and maintained a data platform in GCP for batch and event-based data sources. Built data products using DBT for the organization's stakeholders. Developed end-to-end RAG-based applications for data exploration using natural language. Deployed and maintained web applications on GCP, optimized CI/CD workflows, and led architecture decisions for scalable, secure, and automated AI solutions across the organization.

#### Senior Data Scientist - Consultant

*Oslo University Hospital - Cytofit. Norway.*

2024  
2023

Developed a Python web application to clean and analyze omics data. The pipeline leveraged supervised AI methods to extract features and identify biomarkers predictive of clinical outcomes. Implemented front-end (Streamlit and Dash), database (MongoDB and PostgreSQL), API (FastAPI) and parallelization solutions to optimize the pipeline's performance. Led a team of 5 with agile methods (SCRUM). Secured 5 MNOK funding (2 MNOK from Innovation Norway).

#### Data Scientist and Backend Developer - Consultant

*Resonyx. Norway.*

2022  
2021

Analyzed terabytes of high-frequency audio data to detect anomalies and baseline variations. Developed and deployed ML/AI models to predict failures in heavy hydropower machinery. Maintained an AWS cloud infrastructure, including databases, long-term storage, roles and monitoring systems. Led a team of 7 with agile methods (SCRUM).

#### Researcher

*Italian Institute of Technology. Italy*

2021  
2017

Studied the interaction between drugs and biomolecules with ML/AI and statistical inference models, in Python. Participated in 4 drug discovery campaigns and identified hit compounds for different forms of cancer and bacterial infections. Authored 9 peer-reviewed publications and supervised 2 master's students.



## Scientific Publications

- 1 **Franco-Ulloa, S.**, Cesari, A., Zanoni, G., Riccardi, L., Wallace, J., Mascitti, B. B., Rastrelli, F., Mancin, F. & De Vivo, M. Rational Design of Gold Nanoparticle-based Chemosensors for Detection of the Tumor Marker 3-Methoxytyramine. **2025**. *Chem. Sci.* 16: 6282-6289.
- 1 **(Cover article) Franco-Ulloa, S.**, Cesari, A., Riccardi, L., De Biasi, F., Rosa-Gastaldo, D., Mancin, F., De Vivo, M. & Rastrelli, F. Molecular Mechanisms Underlying Detection Sensitivity in Nanoparticle-Assisted NMR Chemosensing. **2023**. *J. Phys. Chem. Lett.* 14 (30): 6912-6918.
- 2 **(Cover article) Franco-Ulloa, S.**, Riccardi, L., Rimembrana, F., Grottin, E., Pini, M. & De Vivo, M. NanoModeler CG: A Tool for Modeling and Engineering Functional Nanoparticles at a Coarse-Grained Resolution. **2023**. *J. Chem. Theory Comput.* 19 (5): 1582-1591.
- 3 **(Cover article) Pecina, A.** Rosa-Gastaldo, D., Riccardi, L., **Franco-Ulloa, S.**, Milan, E., Scrimin, P., Mancin, F. & De Vivo, M. On the metal-aided catalytic mechanism for phosphodiester bond cleavage performed by nanozymes. **2021**. *ACS Catal.* 11 (14): 8736-8748.
- 4 **(Cover article) Franco-Ulloa, S.**, Guarnieri, D., Riccardi, L., Pompa, P. P. & De Vivo, M. Association mechanism of peptide-coated metal nanoparticles with model membranes: A coarse-grained study. **2021**. *J. Chem. Theory Comput.* 17 (7): 4512-4523.
- 5 **(Co-first author) Morillas-Becerril, L.**, **Franco-Ulloa, S.**, Fortunati, I., Marotta, R., Sun, X., Zanoni, G., De Vivo, M. & Mancin, F. Specific and nondisruptive interaction of guanidium-functionalized gold nanoparticles with neutral phospholipid bilayers. **2021**. *Commun. Chem.* 93: 4.
- 6 Mestizo, P. D., Narváez, D. M., Pinzón-Ulloa, J. A., Torres Di Bello, D., **Franco-Ulloa, S.**, Macías, M. A., Groot, H., Miscione, G. P., Suescun, L. & Hurtado, J. J. Novel complexes with ONNO tetradentate coumarin Schiff-base donor ligands: X-ray structures, DFT calculations, molecular dynamics and potential anticarcinogenic activity. **2020**. *Biometals.* 34: 119-140.
- 7 **Franco-Ulloa, S.**, Tatulli, G., Løland-Bore, S., Moglianetti, M., Pompa, P. P., Cascella, M., De Vivo, M. Dispersion state phase diagram of citrate-coated metallic nanoparticles in saline solutions. **2020**. *Nat. Comm.* 11: 5422.
- 8 Ortega, J. A., Arencibia, J. M., Minniti, E., Byl, J. A. W., **Franco-Ulloa, S.**, Borgogno, M., Genna, V., Summa, M., Bertozzi, S. M., Bertorelli, R., Armirotti, A., Minarini, A., Sissi, C., Osheroff, N. & De Vivo, M. Novel, potent, and druglike tetrahydroquinazoline inhibitor that is highly selective for human topoisomerase II  $\alpha$  over  $\beta$ . **2020**. *J. Med. Chem.* 63 (21): 12873-12886.
- 9 Arencibia, J. M., Brindani, N., **Franco-Ulloa, S.**, Negro, M., Kuriappan, J. A., Ottonello, G., Bertozzi, S. M., Summa, M., Giroto, S., Bertorelli, S., Armirotti, A. & De Vivo, M. Design, synthesis, dynamic docking, biochemical characterization, and in vivo pharmacokinetics studies of novel topoisomerase II poisons with promising antiproliferative activity. **2020**. *J. Med. Chem.* 63 (7): 3508-3521.
- 10 **(Cover article) Franco-Ulloa, S.**, Riccardi, L., Rimembrana, F., Pini, M. & De Vivo, M. NanoModeler: A webserver for molecular simulations and engineering of nanoparticles. **2019**. *J. Chem. Theory Comput.* 15 (3): 2022-2032.
- 11 Torres, J. F., Macías, M. A., **Franco-Ulloa, S.**, Miscione, G. P., Cobo & J., Hurtado, J. J. Cu(II) and Zn(II) complexes with dinitrobenzoates and pyrazolyl ligands: structural and thermal stability influence of N-H moiety. **2019**. *Crystal Growth and Design.* 19 (6): 3348-3357.
- 12 **Franco-Ulloa, S.**, La Sala, J., Miscione, G. P. & De Vivo, M. Novel bacterial topoisomerase inhibitors exploit Asp83 and the intrinsic flexibility of the DNA gyrase binding site. **2018**. *Int. J. Mol. Sci.* 19 (2): 453.
- 13 **Franco-Ulloa, S.**, Ramos-Guzmán, C. A. & Miscione, G. P. The evolution of drug design and the role of computational methods: Playing to be God. **2016**. *Hipótesis.* 21: 40-49.

## Oral and Poster Scientific Presentations

- 1 Invited speaker at the **Intelligent Health Conference**. 2024. *Norway*.
- 2 Speaker at the **Properties and Functionalities of Nanometer and Sub-Nanometer Sized Quantum Objects Gordon's Research Conference**. 2019. *Switzerland*.
- 3 Poster presentation at the **New Perspectives of Nanostructured Devices and High-Resolution Characterization Techniques Gordon's Research Seminar**. 2019. *Switzerland*.
- 4 Poster presentation at the **Nucleic acid immunity: from cellular mechanisms to new technologies SIBBM seminar**. 2019. *Italy*.
- 5 Speaker at the **Challenges in modelling and simulations of nanoparticles in complex environments CECAM workshop**. 2019. *Italy*.
- 6 Poster presentation at the **Translational and Health Informatics: Implications for Drug Discovery EuroQSAR Symposium**. 2018. *Greece*.
- 7 Poster presentation at the **Multiscale modelling in electrophysiology: from atoms to organs CECAM workshop**. 2018. *Switzerland*.
- 8 Poster presentation at the **1st Protein Structure, Function, and Drug Discovery School**. 2017. *Colombia*.
- 9 Speaker at the **42nd Theoretical Chemists of Latin Expression Congress**. 2016. *Uruguay*.
- 10 Speaker at the **6th National Congress of Theoretical and Computational Chemists**. 2016. *Colombia*.
- 11 Speaker at the **2nd Colombian Congress of Biochemistry and Molecular Biology**. 2016. *Colombia*.

## Volunteering

- 2024 • **Peer Reviewer**  
2019 • *Journal of Chemical Theory and Computation*  
Reviewed one manuscript per month on computational biology and assess their potential for publication.
- 2021 • **Teacher**  
2020 • *Foundation for Educational Equity, Colombia*  
Designed a year-long introductory Python course targeting high school students in remote areas of Colombia with limited internet access. Provided slides and recorded teaching sessions.
- 2021 • **Quiero Mentoría ("I Want Mentorship") Program**  
2020 • *Uniandinos - Alumni Association, Colombia*  
Provided mentorship to 2 undergraduate mentees for a total of 6 hours per month and assisted them in their transition to a professional working environment or postgraduate programs.
- 2015 • **Board Member at the Student's Council**  
2013 • *University of Los Andes, Colombia*  
Participated in the final decision-making process for students' academic and disciplinary matters, involving approximately ten cases per week.
- 2013 • **Teacher/Fundraiser**  
2012 • *SOSAndes - Students Offering Support, Colombia*  
Raised ca. 300€ giving physics classes to build shelters for underprivileged communities in Colombia.



## Special Achievements

1

**Full scholarship** from Becas Santander to enroll in an online course from the *Massachusetts Institute of Technology (MIT)*. The scholarship covered the enrollment fee of \$2,300 of the MIT - Leading Digital Transformation certified course.

2

Winner of the **research grant** HP10CR7KHL from the *Italian SuperComputing Resource Allocation-Class C (ISCRA-C)*. Earned 25,000 core hours from the SuperComputing Applications and Innovation (SCAI) center.