

Sebastian Franco Ulloa, Ph.D.

Biocomputational Scientist

I am a consultant at Expert Analytics AS, where I have fulfilled roles as a researcher in bioinformatics, senior data scientist and backend software developer. I hold a Ph.D. in biocomputational sciences and have a background in physics and chemistry, complemented by a passion for teaching. My interests span biostatistics, machine learning/artificial intelligence, and immunology. My values are rooted in the scientific method and critical thinking. I approach challenges with an analytical and compassionate mindset, actively seeking diverse perspectives to form well-informed and rational judgments. I describe myself as a self-aware, determined individual with a sense of humor.

Contact

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📍 Toftes Gate 11B, 0556.
Oslo, Norway

Skills

Bioinformatics

Drug discovery and development

Machine learning

Statistical analysis

Data visualization

Scientific communication

Teaching

</> Programming

Python

Bash

LaTeX

Git

Docker

AWS

🗣 Languages

Spanish

English

Italian

📁 Work Experience

Senior Data Scientist

Oslo University Hospital - CellFIT. Norway.

Now
2023
Designed and implemented a Python-based web application to load, clean, visualize and analyze mass cytometry data. The pipeline also leverages supervised machine learning methods for feature extraction and prediction of clinical outcomes.

Biomedical Outreach Representative

Expert Analytics. Norway.

Now
2022
Represented Expert Analytics at Oslo Cancer Cluster and cultivated relationships with academic and industrial organizations in the biomedical sector at notable European gatherings like Cancer Crosslinks 2023 and the Nordic Precision Medicine Forum 2023.

Senior Data Scientist and Backend Developer

Edge Audio Analytics. Norway.

2022
2021
Analyzed terabytes of high-frequency audio data to detect anomalies and baseline variations. Developed predictive maintenance models for heavy hydropower machinery. Contributed to a federated learning product. Led an 8-people team utilizing the SCRUM framework.

Part-time Professor

University of Los Andes. Colombia.

2016
2016
Trained undergraduate students in analytical chemistry and laboratory best practices. Graded over 50 assignments per week including lab reports, quizzes, and exams.
Grade from students: 3.72/4.00

🎓 Education

Ph.D. Biocomputational Sciences (*cum laude*)

2021
Italian Institute of Technology. Italy.

2017
Thesis title: *Multiscale Modeling of Metal Nanoparticles for Biotechnological Applications*

BSc. Physics (GPA 3.59)

2017
University of Los Andes. Colombia.

2012
Thesis title: *Simulations of a Weakly Self-Interacting Fluid Using Lattice Boltzmann Methods (Graded 4.00/4.00)*

BSc. Chemistry (GPA 3.57)

2016
University of Los Andes. Colombia.

2011
Thesis title: *Application of Molecular Mechanics for the Discovery of Novel Microbial IIA Topoisomerases Inhibitors (Graded 4.00/4.00)*

Scientific Publications

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

Volunteering

- Now
2019 • **Peer Reviewer**
Journal of Chemical Theory and Computation - Impact factor 6.006
Review ca. 2 manuscripts per month on computational biology and assess their potential for publication.
- 2021
2020 • **Teacher**
Fundación para la Equidad Equitativa. 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
2020 • **Quiero Mentoría ("I Want Mentorship") Program**
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
2013 • **Board Member at the Student's Council**
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
2012 • **Teacher/Fundraiser**
SOSAndes - Students Offering Support. Colombia
Raised ca. 300€ giving physics classes to build shelters for underprivileged communities in Colombia.