

SEBASTIÁN AYALA-RUANO

I am a focused and motivated young researcher that has worked in **Bioinformatics** and **Cheminformatics** for **four years** at different laboratories. My current interests are devoted to **Network Science**, **Complex Systems**, and **Machine Learning** for drug discovery. Moreover, I am involved in various initiatives to empower Bioinformatics in Ecuador and Latin America.

EDUCATION

2020
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2016

B.Eng., Biotechnology

Universidad San Francisco de Quito (USFQ)

📍 Quito, Ecuador

- **Minor:** Systems engineering.
- **GPA:** 3.78/4 (Magna Cum Laude) - second best score of the College of Biological and Environmental Sciences 2020 class.

RESEARCH EXPERIENCE

2021

Applied Signal Processing and Machine Learning Research Group - USFQ

Research Assistant

📍 Quito, Ecuador

- Created a method based on network science and similarity searching to explore the chemical space of antiparasitic peptides and discover new drugs (See details [here](#)).
- **Advisors:** [Yovani Marrero-Ponce](#), [Noel Pérez Pérez](#)

2020
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2017

Computational and Theoretical Chemistry Group - USFQ

Undergraduate Researcher

📍 Quito, Ecuador

- Identified binding specificity between repressor proteins and a transcriptional factor associated with the jasmonic acid pathway in *Arabidopsis thaliana* through molecular dynamics simulations and machine learning algorithms (See details [here](#)).
- **Advisor:** [Miguel Angel Méndez Silva](#)

2020
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2018

Bio-Chemoinformatics Group - Universidad de Las Américas

Research Intern

📍 Quito, Ecuador

- Understood the impact of horizontal gene transfer in the genome of *Streptomyces clavuligerus* using phylogenetics, and other bioinformatics tools (See details [here](#)).
- Proposed molecular mimicry between Zika envelope protein and human neuronal proteins through molecular dynamics and protein-protein interaction networks.
- **Advisors:** [Vinicio Armijos](#), [Yunierkis Perez](#)

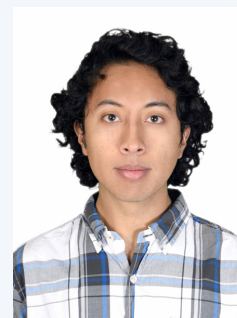
2019

Tumor Metabolism and Therapeutic Oncology Laboratory - Gwangju Institute of Science and Technology

Research Intern

📍 Gwangju, South Korea

- Performed density functional theory and molecular dynamics simulations to understand the impact of a mutation in the ZN domain of the CRBN protein (See details [here](#)).
- I continued working on this research project in my undergraduate thesis, and now we are in the process of publishing these results in a scientific article.
- **Advisors:** [Miguel Angel Méndez Silva](#), [Steve K. Cho](#)



CONTACT

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✉ sebasar1245@gmail.com



SKILLS

Technical

Programming Languages:



DevOps:



Data Science:



Databases and Cloud:



Languages

Spanish: Native

English: Advanced | C1 |
TOEFL iBT 109

Korean: Basic

German: Basic

The source code is available at
[sayalaruano/cv](https://sayalaruano.github.io/cv).

Last updated on 2022-03-21.

View this CV online at
sayalaruano.github.io/cv



TEACHING EXPERIENCE

- 2021 ● **Linux and Bash/AWK scripting Boot Camp**
 RSG Ecuador and iGEM Ecuador 📍 Virtual event
- Co-organizer and co-instructor. I designed and taught most of the [course material](#).
 - This course covered the basics of Linux, terminal usage, text and file processing command line tools, Bash/AWK scripting with applications in Bioinformatics, and Git/GitHub.
- 2020 ● **Undergraduate Teaching Assistant**
 Learning Center - USFQ 📍 Virtual events
- Provided online mentorship of Biotechnology, Mathematics, and Systems Engineering subjects to undergraduate students that needed help.
- 2018 |
 2016 ● **Undergraduate Teaching Assistant**
 General Biology Laboratory - USFQ 📍 Quito, Ecuador
- Graded reports, tests, and other homework from the course.
 - Provided feedback and guidance to undergraduate students in topics of the course.



PUBLICATIONS

- **Ayala-Ruano S.**, Marrero-Ponce Y., Aguilera-Mendoza L., Pérez N., Agüero-Chapin G., Antunes A., Aguilar A. (2021). *Exploring the Chemical Space of Antiparasitic Peptides and Discovery of New Promising Leads through a Novel Approach based on Network Science and Similarity Searching*. **ChemRxiv** [Preprint]. doi: doi.org/10.33774/chemrxiv-2021-tgv69.
- Castillo-Vilcahuaman, C., Valdivia C., Osorio-Mogollón C., Silva-Andrade, C., Puche, R., **Ayala-Ruano, S.**, Cuesta-Astro, Y., Parra, G (2020). *4th ISCB Latin American Student Council Symposium: a virtual and inclusive experience during COVID19 times*. **F1000Research**, 9. doi: [10.12688/f1000research.28330.1](https://doi.org/10.12688/f1000research.28330.1).
- Oña-Chuquimarca, S., **Ayala-Ruano, S.**, Goossens, Pauwels, L., Goossens, A., Leon-Reyes, A., & Méndez, M. A (2020). *The molecular basis of JAZ-MYC coupling, a protein-protein interface essential for plant response to stressors*. **Frontiers in Plant Science**, 11, 1139. doi: [10.3389/fpls.2020.01139](https://doi.org/10.3389/fpls.2020.01139). This article was included in the Frontiers in Plant Science 2020 highlights e-book. doi: [10.3389/978-2-88966-723-9](https://doi.org/10.3389/978-2-88966-723-9).
- **Ayala-Ruano, S.**, Santander-Gordón, D., Tejera, E., Perez-Castillo, Y., & Armijos-Jaramillo, V. (2019). *A putative antimicrobial peptide from Hymenoptera in the megaplasmid pSCL4 of Streptomyces clavuligerus ATCC 27064 reveals a singular case of horizontal gene transfer with potential applications*. **Ecology and Evolution**, 9 (5), 2602-2614. doi: [10.1002/ece3.4924](https://doi.org/10.1002/ece3.4924).



CONFERENCE PRESENTATIONS

- *The molecular basis of JAZ-MYC coupling, a protein-protein interface essential for plant response to stressors*. (2021). Oral presentation. **6th Brazilian Student Council Symposium: Omics and Data Science** (See details [here](#)).
- *Modeling of protein-protein interaction and search for key residues by machine learning of the JAZ-MYC3 complex of Arabidopsis thaliana*. (2020). Oral presentation. **5th RSG-Argentine Symposium of Young Researchers in Bioinformatics** (See details [here](#)).
- *In silico detection of horizontal gene transfer in Streptomyces clavuligerus*. (2020). Oral presentation. **International Society for Computational Biology Student Council Webinar series** (See details [here](#)).
- *In silico detection of an antimicrobial peptide (AMP) transferred horizontally from arthropods to bacteria*. (2019). Oral presentation. **2nd RSG-Colombia Symposium** (See details [here](#)).
- *Modeling of Protein-protein interaction and search for key residues by machine learning of a protein complex in the jasmonic acid route in Arabidopsis thaliana*. (2019). Poster presentation. **XLIII National Biology Conference** (See details [here](#)).
- *Structural changes due to a mutation in Cereblon might be a cause for intellectual disability*. (2019). Poster presentation. **Global Intern Program - Gwangju Institute of Science and Technology** (See details [here](#)).



HONORS AND AWARDS

- 2021 ● **Best oral presentation award**
 6th Brazilian Student Council Symposium: Omics and Data Science 📍 Virtual event

- 2021 ● **Innovation challenge For more data on labor informality award**
 Datalat, PNUD Ecuador, UN Women Ecuador, and the International Labour Organization 📍 Virtual event
- This competition searched for a technological solution to collect labor informality data in Ecuador. There were 39 proposals from 80 interdisciplinary teams (See details about the challenge [here](#)).
- 2020 | 2016 ● **Chancellor's Honor List**
 Universidad San Francisco de Quito 📍 Quito, Ecuador
- This award recognizes students who have a GPA of 3.7/4 or higher.
- 2020 ● **Third HPC Summer School Colombia: Bio and Data Science scholarship**
 CyberColombia 📍 Virtual event
- The scholarship covered registration expenses for the event.
- 2019 ● **2nd RSG-Colombia Symposium travel award**
 RSG Colombia 📍 Ibagué, Colombia
- This award covered the travel expenses to attend the event.
- 2019 ● **Global Intern Program**
 Gwangju Institute of Science and Technology 📍 Gwangju, South Korea
- The GIP awarded students with accommodation and a monthly stipend to cover living expenses for eight weeks. During this time, we were involved in a research project and received valuable training and mentoring.

LEADERSHIP AND SERVICE

- Current | 2020 ● **Regional Student Group (RSG) Ecuador**
 International Society for Computational Biology Student Council 📍 Quito, Ecuador
- Co-founder and current president of the RSG Ecuador. This group aims to create a long-lasting community of students and researchers residing in Ecuador that work on Bioinformatics.
 - Co-chair of the [1st Ecuadorian-Venezuelan Symposium of Young Bioinformatics Researchers](#).
 - Fellowship committee chair of the [17th Student Council Symposium](#).
 - Contributed to the program and fellowships committees of the [4th ISCB Latin American Student Council Symposium](#).
- 2021 ● **HerrCompBioinfo**
 Regional Student Group Ecuador and Open Life Science (OLS) program 📍 Virtual event
- Created an open-source educational resource of computational tools for Bioinformatics enthusiasts written in Spanish.
 - During the OLS program, I learned how to create and manage open science and open source projects.
- 2021 ● **Saturdays.AI Quito 2021 project leader**
 Saturdays.AI Quito 📍 Virtual event
- Led my group project, which was an early plant disease detector based on convolutional neural networks, trained to recognize two types of maize infectious diseases.(See details [here](#)).

Note: I have developed other personal projects related to data science, machine learning, drug discovery, and other topics (See details [here](#)).