Isis Sebastião

Contact Information:
+55 (15) 98120-5685
isisebastiao@gmail.com
Visa: B1/B2 U.S nonimmigrant visa
Campinas – São Paulo (Brazil)
LinkedIn: https://www.linkedin.com/in/isis-sebastiao/
Google scholar:https://scholar.google.com.br/citations?user=9EAvzOkAAAAJ&hl=pt-BR
Professional website: https://isissebastiao.github.io/

Summary: Agronomist with a Master's degree in Agronomy, a PhD in Biotechnology and postdoctoral training in Plant Genetics, with over 10 years of experience in applied research. Strong background in R&D projects spanning biotechnology, plant genetics and molecular biology, combining advanced laboratory expertise with robust data analysis skills. Experienced across the full research and development cycle, from experimental design and protocol execution to data interpretation and reporting. Proficient in a wide range of laboratory techniques, including gene expression analysis, *in vitro* culture, fermentation, bioassays and chromatographic analyses (HPLC and GC), as well as routine molecular and biophysical procedures. Skilled in analytical and computational tools such as Excel, R, Origin, BLAST, and bioinformatics and molecular visualization software. Proven ability to work in both academic and industrial environments, with contributions to process optimization, quality control and technical team supervision at Dow AgroSciences.

MAIN INTERESTINGS

- Plant Molecular Biology and Gene Regulation
- Crop Improvement and Plant Stress Adaptation
- Sustainable Agriculture and Climate Resilience
- Protein Structure and Function in Plant Systems
- Integrative Approaches in Plant Science (Experimental and Computational)
- Plant Ecology, Conservation, and Science Education

EXPERIENCE

2023 - 2025 **STATE UNIVERSITY OF CAMPINAS (UNICAMP)** SÃO PAULO, BRAZIL
Plant Genetics Researcher – post-doctoral level (funded by FAPESP)

- Investigated the role of metabolic regulators (bZIP1, bZIP53 and bZIP63) under conditions of nutritional variation using a plant model system, identifying nutrient-dependent regulation of gene expression and partial diurnal degradation of bZIP63, with potential applications in transgenic development and nutritional strategies to optimize plant growth and development.
- Developed and implemented *in vitro* culture protocols and mineral nutrition assays, conducting gene expression analyses, leaf sample preparation, and standardized laboratory routines to improve process efficiency.
- Analyzed experimental data using statistical tools (Excel and R), generating graphs and technical reports to support decision-making and results communication.
- Coordinated the supervision of junior researchers and collaborated with international partners, including researchers from Yale University.
- Managed laboratory inputs and supplier relations and represented the research group at an international scientific congress in San Diego, USA, presenting results relevant to plant biotechnology.

2023 - 2023 **SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP)** SÃO PAULO, BRAZIL
Research Analyst

- Conducted applied research in an innovation-driven project, designing experiments and performing fermentation assays to support bio-based production processes aligned with project goals.
- Executed and optimized laboratory analyses, including bench-scale fermentation and metabolite quantification (HPLC, GC), improving data reliability through calibration curves and robust quality control practices.
- Analyzed and validated experimental datasets using Excel and Biostat, identifying trends and inconsistencies and delivering technical reports to support data-driven decision-making within defined timelines.

2018 - 2022 **SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP)** SÃO PAULO, BRAZIL
Biotechnology Researcher – PhD level (funded by CNPq)

- Conducted research in structural biology with a focus on the HbAg protein, applying biophysical assays and integrating techniques for molecular characterization and computational modeling, with potential applications in the development of biosensors for environmental contamination detection.
- Modeled and manipulated protein structures using AlphaFold and PyMOL, generating a theoretical model of HbAg and applied bioinformatics tools such as InterProScan and PROSITE to identify HbAg proteins in the species *Amynthas gracilis*.
- Prepared biological samples, cultivated microorganisms and applied advanced laboratory techniques to support experimental workflows. Managed laboratory routines, including technical procurement, inventory control, supplier coordination, and technical support for the research team.
- Performed data analysis using Excel and Origin, generated scientific figures and contributed to peer-reviewed publications, conference presentations and academic activities, including practical teaching support in Chemistry and participation in undergraduate thesis examination committees.

2017 - 2017 **SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP)** SÃO PAULO, BRAZIL
Plant Breeding Professor

- Delivered theoretical and practical classes to a cohort of approximately 50 students, including greenhouse-based activities, and developed instructional materials for classroom and laboratory sessions.
- In practical classes, used the crop model plant Micro-Tom, a short variety of tomato, and conducted pollen collection, emasculation, and plant crosses.
- Designed exams and assessment materials, reviewed and edited course content, and organized references and literature reviews, ensuring a coherent pedagogical structure and effective support for student learning.

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2013 - 2015 **SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP)** SÃO PAULO, BRAZIL
Genetics and Plant Breeding Researcher – master's level (funded by CAPES)

- Conducted research on *Helicoverpa armigera*, a major agricultural pest affecting crops such as soybean, maize and cotton, causing significant economic losses. Evaluated interactions among Cry proteins in toxicity bioassays, demonstrating that combinations of Cry1 proteins are not recommended for the development of transgenic plants targeting this pest due to their potential to accelerate the emergence of resistant insect populations.
- Performed bioassays to assess feeding behavior and toxicity of artificial diets across different Lepidoptera species, and carried out microorganism cultivation, protein extraction and purification, and optimization of laboratory and operational standard operating procedures (SOPs).
- Managed and analyzed experimental data and led scientific communication activities, including event organization, student representation, and publication of peer-reviewed scientific articles.

2012 - 2012 **DOW AGROSCIENCES** SÃO PAULO, BRAZIL
Industrial Seed Processing Intern (Corn and Sorghum)

- Supported continuous improvement initiatives at the Seed Processing Plant (UBS), developing three practical projects focused on pest control in stored grains, optimization of ear reception, and cleaning efficiency of processing lines.
- Contributed to the implementation of quality assurance protocols, applied 5S practices, and prepared technical reports in visual panel format, strengthening early experience in an industrial environment and supporting gains in operational efficiency.

2009 - 2011 **SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP)** SÃO PAULO, BRAZIL
Undergraduate Researcher in Plant Genetics - (funded by FAPESP)

- Conducted research to identify genetic markers in the medicinal plant *Pimenta pseudocaryophyllus*, a species of high relevance to local riparian communities, performing literature review, DNA extraction, sample preparation, PCR and electrophoresis, as well as organizing and analyzing data using Excel.
- Validated 15 genetic markers enabling population diversity mapping and supporting conservation strategies, with potential application to other species within the same family, contributing to the cultural, environmental and economic sustainability of traditional communities and the Atlantic Forest biome.
- Published a peer-reviewed scientific article reporting research findings, provided scientific support to additional research projects, and delivered short courses in Genetics and Environmental Education

EDUCATION

2018 - 2022 SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP) SÃO PAULO, BRAZIL
PhD in Biotechnology

2013 - 2015 SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP) SÃO PAULO, BRAZIL
Master's in Agronomy

2007 - 2012 SÃO PAULO STATE UNIVERSITY "JÚLIO DE MESQUITA FILHO" (UNESP) SÃO PAULO, BRAZIL
Bachelor's degree in Agronomic Engineering

PUBLICATIONS

1. de A. Campos, R.; Carlson, P. T.; **Sebastião, I**.; Vieira, J. G. P.; Matiolli, C. C.; Viana, A. J. C.; Vincentz, M. *bZIP63* misregulation affects growth and target gene expression under short-day photoperiods. bioRxiv 2026.03.21.713353; *preprint,* 2026. doi: https://doi.org/10.64898/2026.03.21.713353.
2. Ramos, L.; Souza, C. O.; **Sebastião, I.**; Bertini, G.; Carvalho, F. A. O.; da Silva, R. M. G.; Vilanculo, E. M.; Pereira, J. S.; Santiago, P. S. Biophysical Characterization of Shrimp Hemocyanins: Stability and Emerging Biotechnological Applications. *Biomolecules*, v. 15, p. 675, 2025. DOI: 10.3390/biom15050675
3. Oliveira, J. B. S.; Ramos, L.; Souza, C. O.; **Sebastião, I.**; Caruso, C.; Carvalho, F. A. O.; Carvalho, J. W. P.; Morgante, P. G.; Santiago, P. S. Initial biophysical characterization of *Amynthas gracilis* giant extracellular hemoglobin (HbAg). *European Biophysics Journal with Biophysics Letters*, v. 49, p. 473-484, 2020. DOI:10.1007/s00249-020-01455-8
4. Soares Figueiredo, Camila; Nunes Lemes, Ana Rita; **Sebastião, Isis**; Desidério, Janete Apparecida. Synergism of the *Bacillus thuringiensis* Cry1, Cry2, and Vip3 Proteins in *Spodoptera frugiperda* Control. *Applied Biochemistry and Biotechnology*, v. 1, p. 1-12, 2019. DOI: 10.1007/s12010-019-02952-z
5. Lemes, Ana Rita Nunes; Figueiredo, Camila Soares; **Sebastião, Isis;** Marques Da Silva, Liliane; Da Costa Alves, Rebeka; De Siqueira, Herbert Álvaro Abreu; Lemos, Manoel Victor Franco; Fernandes, Odair Aparecido; Desidério, Janete Apparecida. Cry1Ac and Vip3Aa proteins from *Bacillus thuringiensis* targeting Cry toxin resistance in *Diatraea flavipennella* and *Elasmopalpus lignosellus* from sugarcane. *PeerJ*, v. 5, p. e2866, 2017. DOI: 10.7717/peerj.2866
6. **Sebastiao, I.**; Lemes, A. R. N.; Figueiredo, C. S.; Polanczyk, R. A.; Desiderio, J. A.; Lemos, M. V. F. Toxicidade e capacidade de ligação de proteínas Cry1 a receptores intestinais de *Helicoverpa armigera* (Lepidoptera: Noctuidae). *Pesquisa Agropecuária Brasileira (Online)*, v. 50, p. 999-1005, 2015. DOI:10.1590/S0100-204X2015001100002
7. Morgante, P. G.; **Sebastiao, I.**; Silveira, L. E. D.; Mori, G. M.; Conte, M.; Coffani-Nunes, J. V. Development of microsatellite markers for *Pimenta pseudocaryophyllus* (Myrtaceae), a wild South American species. *American Journal of Botany*, v. 99, p. e434-e436, 2012. DOI:10.3732/ajb.1200167

SKILLS AND LANGUAGES

- Teamwork, proactivity, analytical thinking, adaptability and resilience skills.
- Data validation and quality control; Experimental design; Agricultural pest management; Resistance risk assessment, Agronomic best practices evaluation, Dataset analysis using R, Scientific reporting, SOP development, Interdisciplinary collaboration
- Portuguese – Mother Tongue; English - Advanced (professional writing and communication)
- Microsoft Office Suite (advanced); R (intermediate); Linux (basic); Python (basic), ChimeraX (basic); Pymol (intermediate); BLAST (advanced); Clustal (advanced); Primer3 Plus (advanced); Obsidian (advanced); Inkscape (intermediate); Mendeley (advanced); Grammarly

- Statlab – Basic and Advanced Statistics Course (Word-Aid, ongoing - 50 hours).
- Bioinformatics Training (Word-Aid, ongoing - 80 hours).
- 1st MANACÁ Workshop – Fundamentals and Practices of Macromolecule Crystallography Using Synchrotron Light: From Protein Crystallization to Structural Determination (LNLS/CNPEM, 2025 - 32 hours).

AWARDS & FUNDING

- **FAPESP Post-Doctoral Scholarship-** Process number: 2023/11182-4
- **FAPESP Technical Training Scholarship -** Process number: 2022/16284-7
- **CNPq PhD Scholarship –** Process number: 141022/2018-3
- **CAPES MSc Sholarship**
- **Top of Class Honor Award** – Agronomy, UNESP-Registro & CREA-SP
- **FAPESP Scientific Initiation Scholarship** – Process number: 2009/15964-0

CONFERENCES & PRESENTATIONS

Sebastião, I., Campos, R. A., Carlson, P. T., Vieira, J. G. P., Viana, A. J. C., & Vincentz, M. (2024, July). The influence of transcription factor bZIP63, bZIP1 and bZIP53 on energy homeostasis maintenance. Poster presented at the 34th International Conference on Arabidopsis Research (ICAR 2024), San Diego, CA.

Sebastião, I., Santos, E. S., Pereira, L. M., Morgante, P. G., & Santiago, P. S. (2021, July). Identification and Prediction of HbAg D-Chain Sequence. Poster presented at the 20th IUPAB Congress / 50th SBBq / 45th SBBf Annual Meeting (Virtual).

Sebastião, I., Souza, C. O., Ramos, L., Morgante, P. G., & Santiago, P. S. (2019, October). Interaction of monomer d of the extracellular hemoglobin of *Amynthas gracilis* (HbAg) with the anionic surfactant sodium dodecyl sulfate (SDS). Poster presented at the XLIV Congress of the Brazilian Biophysical Society (SBBf), Santos, Brazil.

Sebastião, I., Oliveira, J. B. S., Ohya, M. C., Souza, C. O., Ramos, L., & Santiago, P. S. (2018, October). Purification and Estimation of the Isoelectric Point (pI) of the Monomer-d of the Extracellular Hemoglobin of *Amynthas gracilis* (HbAg). Poster presented at the XLIII Congress of the Brazilian Biophysical Society (SBBf), Santos, Brazil.

Sebastião, I., Figueiredo, C. S., Lemes, A. R. N., Desidério, J. A., Polanczyk, R. A., & Lemos, M. V. F. (2014, September). Susceptibility of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) to Cry1 proteins from *Bacillus thuringiensis*. Poster presented at the XXV Brazilian Congress of Entomology (CBE 2014), Goiânia, Brazil.

Sebastião, I., Silveira, L. E., Hirata, D. M., Coffani-Nunes, J. V., & Morgante, P. G. (2010, October). Screening for Polymorphic SSR Loci in *Pimenta pseudocaryophyllus* (Gomes) Landrum (Myrtaceae). Poster presented at the X Latin American Botanical Congress, La Serena, Chile.

TEACHING & MENTORING

- Mentored PhD and undergraduate students during postdoctoral training (2023 to 2025)
- Mentored undergraduate students during doctoral training (2018 to 2022)
- Mentored practical chemistry classes for agronomy undergraduates (2018)
- Professor of Plant Breeding for agronomy undergraduates (2017)

REFERENCES

Professor PhD Michel Vincentz
Laboratório de Genética de Plantas (LAGEP)
Centro de Biologia Molecular e Engenharia Genética da Unicamp (CBMEG)
Universidade Estadual de Campinas, Unicamp, Campinas, SP.
E-mail: mgavince@unicamp.br

Professor PhD Patrícia Soares Santiago
Departamento de Agronomia e Recursos Naturais
Faculdade de Ciências Agrárias do Vale do Ribeira
Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP

Vice-coordenadora Executiva do IEAMAr/UNESP
E-mail: patricia.santiago@unesp.br

Professor PhD Patrícia Gleydes Morgante
Departamento de Agronomia e Recursos Naturais
Faculdade de Ciências Agrárias do Vale do Ribeira
Universidade Estadual Paulista “Júlio de Mesquita Filho” – UNESP
E-mail: patricia.morgante@unesp.br