

KAROL M. SÁNCHEZ SÁNCHEZ

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SUMMARY

Distinguished, passionate, and proactive student with a background in biology with a specialization in biotechnology. Technical and laboratory experience in research laboratories since sophomore year, with five years of experience in the areas of genetics, biotechnology, proteins, microorganisms, and molecular biology in the laboratories of Genomic Analysis, Biochemistry, and Protein Biotechnology of the National University of Costa Rica and in the National Center for Biotechnological Innovations of CR. Characterized by being results-oriented and known for interdisciplinary teamwork, constant learning, leadership, problem solving, critical thinking, and creativity.

RESEARCH AREAS

- Biotechnology
- Molecular Biology
- Genetics
- Microbiology
- Microorganisms physiology
- Genetic Engineering

EDUCATION

2019 – 2021 (Expected) **Licentiate in Biology (Specialization in Biotechnology)** | *Universidad Nacional de Costa Rica (UNA)* (The National University of Costa Rica) | 9.63/10 GPA
Thesis: Design and Phenotypic Characterization of Mutants of the FruBKA Operon from *Pseudomonas putida* KT2440

2015 - 2018 **Bachelor's degree in Biology with a specialization in Biotechnology** | *Universidad Nacional de Costa Rica (UNA)* | 8.96/10 GPA

PROFESSIONAL AND RESEARCH EXPERIENCE

2019 Present - RESEARCH ASSISTANT | *Centro Nacional de Inovaciones Biotecnológicas (CENIBiot)*, (National Center for Biotechnological Innovations) | San José, CR

- Investigates the phenotypic behavior of the fructose metabolism operon in *Pseudomonas putida* to study the function of FruK protein.

- Designs spacers for the CRISPR/Cas9 complex and recombination primers to delete two genes of fructose metabolism in *Pseudomonas putida*.
Accomplishment: All primers have been successfully prepared and are working; the next steps will involve deleting genes and making growth cultures to analyze the phenotypic behavior of the bacteria.
- 2018 - 2020 RESEARCH ASSISTANT | **Laboratorio de Bioquímica y Biotecnología de Proteínas (LBBP)** (Biochemistry and Biotechnology Protein Laboratory), *Universidad Nacional de Costa Rica* | Heredia, CR
- Analyzed protein's extracts with chromatography techniques.
 - Performed protein purification, hemolytic analysis, and quantification of proteins.
Accomplishment: Proteins were purified and tested successfully.
- 2018 - 2019 RESEARCH ASSISTANT/INTERN (GRADUATION REQUIREMENT) | **Centro Nacional de Innovaciones Biotecnológicas (CENIBiot)**, (National Center for Biotechnological Innovations) | San José, CR
- Developed a genetic complementation to the Selenium metabolism of *Pseudomonas putida* KT2440.
 - Inserted two genes into plasmids to be introduced in *Pseudomonas putida* KT2440.
Accomplishment: 1 gene was complemented; molecular biology techniques were learned.
- 2016 - 2019 RESEARCH ASSISTANT | **Laboratorio de Análisis Genómico (LAGEN)** (Laboratory of Genomic Analysis), *Universidad Nacional de Costa Rica* | Heredia, CR
- Collaborated in genetic analysis of the soil amphipod *Cerrodontomyia hyloraina* and *Talitroides topitotum*.
 - Developed DNA extractions, PCRs, electrophoresis gels, and sequencing.
Accomplishment: An article and a thesis were published in the laboratory.

PRESENTATIONS

- 2020 **Sánchez, K., Chavarría, M.** (2020). Design and Phenotypic Characterization of Mutants of the FruBKA operon from *Pseudomonas putida* KT2440. Gulf Coast Undergraduate Research Symposium at Rice University. (Web)
- 2019 **Sánchez, K., Chavarría, M.** (2019). Importancia del metabolismo en bacterias con aplicación biotecnológica: El caso del operón FruBKA en *Pseudomonas putida* (Importance of metabolism in bacteria with biotechnological applications: The case of the FruBKA operon in *Pseudomonas putida*). *Tlaxcala, México*.

- 2018 **Sánchez, K.,** Ramos, K. (2018). Aislamiento parcial del gen de la hormona androgénica tipo insulina de las ámpulas del camarón asiático *Neocaridina denticulata*, por medio de transcripción reversa, para su caracterización y posterior uso como organismo modelo de crustáceos (Partial isolation of the androgenic like insulin hormone gen from the *Neocaridina denticulata* Asiatic shrimp, through reverse transcriptomic for its characterization and posterior use as a shrimp model organism). Heredia, Costa Rica.
- 2018 **Sánchez, K.,** Avendaño, R., Chavarría, M. (2018). Genetic Complementation of deficient strains to the selenium metabolism of *Pseudomonas putida* KT2440. *San José, Costa Rica.*

ACADEMIC HONORS & FELLOWSHIPS

- 2020 **ALLBIOTECH Leader**
Selected as 1 of the top 100 Biotechnology leaders (aged 18 – 35) in Latin America, to form a community that will help to develop the biotechnology sector and awareness in our region.
- 2020 **Distinguished Student | Universidad Nacional de Costa Rica**
Academic honor for GPA recognition in the Licentiate in Biotechnology program, and for impact on the student community.
- 2020 **Scholarship Recipient | FOCAES Scholarship Program (Funds for Strengthening Student Capabilities), Universidad Nacional de Costa Rica**
Recipient of funds (\$816) to finance the licentiate thesis project, including materials, cost of transportation to and from lab, etc.
- 2019 **Recognition for Second Best Presentation | VI Encuentro Internacional de Biotecnología de UATx, (UATx VI International Encounter of Biotechnology) | Mexico**
Recognized for outstanding presentation on bacteria metabolism out of approximately 60 presenters.
- 2019 **International Conference Grant | Universidad Nacional de Costa Rica**
Full funding (travel, accommodation, food, registration) to attend the *VI Encuentro Internacional de Biotecnología de UATx, (UATx VI International Encounter of Biotechnology)* in Tlaxcala, Mexico in December 2019 (3 days).
- 2018 - 2019 **Research Assistantship | Universidad Nacional de Costa Rica**

Full tuition award and monthly stipend for licentiate degree (2019) and full tuition award for Bachelor's degree (2018) for laboratory merit and work in the *Laboratorio de Bioquímica y Biotecnología de Proteínas (LBBP)*, UNA, (Biochemistry and Biotechnology Protein Lab of the National University of Costa Rica).

RELEVANT COURSEWORK

- 2019 **Proteomics and its Applications in Aquaculture** | *Universidad Nacional de Costa Rica*
- 2019 **Punctual and Massive Analysis of Genetic Expression in Non-model Organisms** | *Universidad Nacional de Costa Rica*
- 2019 **Encounter of Clinical Bioinformatics I** | *Universidad de Costa Rica*
- 2019 **Applied Bio Statistics** | *Universidad Nacional de Costa Rica*
- 2019 **Techniques for Purification and Characterization of Proteins** | *Universidad Nacional de Costa Rica*
- 2019 **Bioinformatics Tools for the Study of Functional Biology** | *Universidad Nacional de Costa Rica*
- 2018 **Introduction to Python programming for Bioinformatics** | *Centro Nacional de Alta Tecnología (National Center for High Technology) and the School of Biological Sciences of the Universidad Nacional de Costa Rica*
- 2018 **Applied Microbiology** | *Universidad Nacional de Costa Rica*
- 2018 **Molecular Bio techniques** | *Universidad Nacional de Costa Rica*
- 2018 **Physiology and Biotechnology of Microorganisms** | *Universidad Nacional de Costa Rica*
- 2018 **Genetic Engineering** | *Universidad Nacional de Costa Rica*
- 2017 **Molecular and Cellular Biology** | *Universidad Nacional de Costa Rica*
- 2017 **Introduction to Biotechnology and Genetic Engineering** | *Universidad Nacional de Costa Rica*

RELEVANT SKILLS

Languages

Spanish (Native)

Statistical Softwares

R Studio

English (Fluent)

German (Basic)

Biotechnological Softwares

CLC Main Workbench

Primer3Plus

Python

Creative Software

Canva