

Ana Gabriela Del Hierro Calvachi

Ecuador ➤ Spain/Ireland

Development of bioprocesses for the bioeconomy using continuous manufacturing



What's your project about?

The main objective of the project is to **develop** the **tools and technologies** required to accelerate the **implementation** of **continuous bioprocessing** in **biorefineries**. This industrially applied Ph.D. project emphasises **academic-industry collaboration** through experimental and modeling work for efficiently **converting carbon sources** into **high-nutritional-value single-cell protein** using **continuous fermentation** manufacturing. This research aims to tackle the **global demand** for **sustainable protein sources** for both food and feed.

Project Partners



UCD's School of **Chemical and Bioprocess Engineering** stands as a prominent hub for **engineering education and research** in Ireland. With a rich history spanning **over 60 years**, the school has consistently produced graduates who possess a strong foundation in **technical, environmental, ethical, and social** aspects of **engineering**. My supervisor is **Professor Eoin Casey**, who heads the **Biofilm Engineering Lab** at UCD.



**University College
Dublin**



Bionet



BIONET is a Spanish **leading manufacturer** of laboratory, pilot and industrial **equipment and software** for the **bioprocessing industry**, as well as a provider of **advanced bioprocess-related services** for companies that want to produce **biomolecules** through **microbial fermentation** or through **cell culturing** processes. My industrial supervisor is **Juan Moreno-Cid, Ph.D.**



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What are you most excited about your project?

I am deeply excited to become an expert in **bioprocess engineering** and **techno-economic modeling**, areas I am **actively learning**. This project serves as a **crucial stepping stone** in this journey. Exploring **alternative protein sources** aligns perfectly with my **passion**, while **repurposing industry byproducts** into valuable alternatives strongly resonates with the **pressing global needs**. This pursuit fuels my **curiosity** and drives my **dedication** to contribute significantly to the **constantly evolving bioindustry**.

What do you find the most challenging in your project?

The **engineering process**, involving calculations and modeling, presents a significant **challenge** for me. Also, the **upscaling** of the process demands a substantial amount of **time** to gather and analyse **sufficient data**.

What brought you to the Bioeconomy?

I was drawn to **Bioeconomy** for several reasons, including the **stark contradictions** I observed in **food waste and poor nutrition**. These issues **inspired** me to search for **alternative protein sources**. Additionally, the alarming **loss of biodiversity** in our ecosystems served as another **strong motivation**. I firmly believe that bioeconomy applications are **crucial** for transforming the industry in a way that's **sustainable** and doesn't harm our **precious natural resources** or **exacerbate biodiversity loss**. I'm committed to tackling these **challenges**, and I think bioeconomy's principles of providing **eco-friendly solutions** while **safeguarding** our environment and biodiversity are a **step in the right direction**.

What does the Bioeconomy mean for you?

Bioeconomy, to me, represents the **strategic utilization** of **biological resources** via **biotechnological applications**. It is a **multifaceted approach** that aims to **harmonize human needs** with **ecological balance** in order to offer **ecofriendly alternatives** that promote both **economic growth** and **environmental sustainability**.

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What did little Ana want to be when she'd grow up?

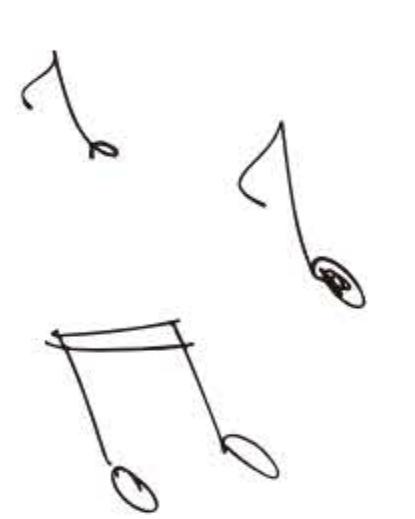
Since childhood, my love for nature and animals fueled dreams of becoming a biologist or a veterinarian. While I cherished exploration and travel, I never realized these passions could align with a scientific career. The notion of pursuing a path as a scientist didn't occur to me.

Something you love? And something you hate?

I adore dogs, cats, and the mountains. Additionally, I thrive on the adrenaline of adventurous sports like waterfall jumping or cliff diving. I hold a deep aversion to exclusion and racism.

Any hobbies outside of Science?

Hiking, dancing, and volunteering in animal shelters



Short CV

- 2008-2013** ★ B. Sc. in Science, Biotechnology Engineering.
Universidad de las Fuerzas Armadas-ESPE, **Ecuador**
- 2014-2016** ● M. Sc. in Environmental Science, Major in Waste
Management. University of Melbourne, **Australia**
- 2016** ● Professional Development Career, United Nations
Industrial Development UNIDO, **Austria**
- 2018-Today** ★ Pro-Loop© Sustainable Protein Co-Founder, **Ecuador**
- 2020-Today** ★ Catálisis Online Journal Co-Founder, **Ecuador**
- 2021** ● Diploma in Socioecological and Energy Transitions.
Universidad EAN, **Colombia**

