

Pauric Donnelly

Ireland

Metabolic engineering to improve methionine synthesis in yeast



What's your project about?

The single-celled yeast ***Saccharomyces cerevisiae*** has been included in animal feed formulations as a **protein source** for many years. The yeast has a good protein content, however the **proportion** of certain essential **amino acids** is relatively **low**. The aim of my project is to use the tools of **metabolic engineering and adaptive laboratory evolution** to generate a yeast that could supply a greater quantity of methionine per gram of protein. This would be a **more efficient feed** that could help **reduce** the **environmental footprint** of **agriculture** in terms of land use, water use and waste.

Project Partners



University College Dublin is the largest university in Ireland with strong ties to Ireland's **biotechnology** sector. I am under the supervision of **Dr. Tanja Narancic**, Assistant Professor in the school of Biomolecular and Biomedical Science. The laboratory focuses on the application of **metabolic engineering** to academic and industry-proposed challenges for the production of more **sustainable** valuable **products**.



**University College
Dublin**



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Alltech Ltd. are a leading global producer of **agricultural products**, aiming to improve the health and performance of animals and crops through **nutrition** and **scientific innovation**. The research facility at the European Headquarters in Dunboyne, Ireland, is coordinated by my industry supervisor, **Dr. Richard Murphy**. He leads an array of projects encompassing **biotechnology, microbiology and chemistry**.



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What are you most excited about your project?

I am very excited to immerse myself and become an expert in the tools of metabolic engineering while applying these tools to a solution for the bioeconomy. Having the opportunity to learn and apply these new skills in real time to a cause that I care about really is a joy and an honour. Adding to this excitement is the fact that the project also affords me many opportunities to meet others on parallel and complementary paths that I can collaborate with and learn from, increasing the potential impact of my work and inspiring new ideas.

What do you find the most challenging in your project?

This project has required me to develop stronger self-organisation skills than I have ever needed before. This was a challenge at the start, but in improving them I have found benefits not only in my work on the project but throughout many areas of my life.

What brought you to the Bioeconomy?

I want to apply my knowledge and skills in molecular biology, along with my keen interest in metabolic engineering to improve the sustainability of core elements of the economy of Ireland, Europe and beyond. In my case, this means the production of more efficient feed for agriculture.

What does the Bioeconomy mean for you?

Economic activities involving the use of renewable biological resources and biotechnology to produce food, feed, bio-based products, energy and services

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What did little Pauric want to be when he'd grow up?

I've been fascinated by nature, how it works and where its complexity has come from since a young age. When I was little, I dreamt of being an explorer, on adventures discovering new creatures and places, sharing them with the world. A career in science and my adventure hobbies have allowed me to realise a form of this dream.

Something you love? And something you hate?

I love the feeling when understanding a difficult concept or overcoming an obstacle in research gives after spending a long time working at it. Hate is a strong word, but I quite dislike the taste of celery.

Any hobbies outside of Science?

Scuba Diving, hiking, rock climbing, swimming, playing music, home fermentation - kombucha, beer...



Short CV

- 2012-2016** ★ B. Sc. in Human Genetics, Trinity College Dublin, Ireland
- 2016-2017** ★ Internship as Research Assistant in Neurogenetics, Trinity College Dublin, Ireland
- 2021-2022** ★ M. Sc in Biotechnology, University College Dublin, Ireland

