

Going to Paris: Preparing for iGEM 2024 with project on water care



Reducing **water contaminants** and **protecting aquatic fauna** are key parts of the project that Tec students will take to **iGEM**, the world synthetic biology competition to be held in **Paris, France**.

The team, made up of **Biotechnology Engineering** students from the Tec's Monterrey campus, will present their project, entitled **Alive**, between **October 23 and 26**. The project was created in response to the **water crisis** taking place in Nuevo León.

The project involves the use of genetically modified **microalgae** which **absorb contaminants** in the water, such as estrogen **EE2**. It is currently at the concept testing stage.

https://www.instagram.com/p/C9iE7fVPxGA/?img_index=1

*"The projects (to be presented at the competition) provide a solution to a **local problem** using synthetic biology.*

*"We focused on the **presence of emerging contaminants** such as hormones and antibiotics in water bodies across the state," said Mi Dam Kim, one of the project's student leaders.*

According to the official iGEM website, the competition will include **more than 450 teams** from **universities around the world**.

The Monterrey campus team is made up of around **20 students** and advising professor **César Puente**, from the Department of Bioengineering.

“It’s an opportunity to accomplish something using what we have developed and learned.”
– **Elisa Nieto**.

Seeking to protect fish

By developing genetically modified microalgae, *Alive* aims to remove the contaminant **EE2** (17-alpha-ethinylestradiol) from the water, which they say **affects male fish**.

*“EE2 is an estrogen that comes in **birth control pills**. However, water treatment plants cannot remove this contaminant to safe levels.*

*“Studies show that male fish begin to **change sex** in the presence of estrogen. If the water quality is not treated, it’s not suitable for generating or sustaining life,”* explained student Eduardo Betancourt.

The seventh semester student added that the project’s vision is for the microalgae to capture **carbon dioxide** in addition to remediating the water.

<https://www.instagram.com/p/C8sTFMUyZ4I/>

How *Alive* works

Mi Dam explained that the project works by the microalgae producing an enzyme called **Laccase**, which deactivates EE2.

“We noticed that the difficult thing about this is regulating the production of the enzyme.

*“The concept testing we’re doing this year is to see whether a protein designed by us is functional in **regulating the enzyme**, and can be controlled and not overproduced,”* she said.

<https://www.instagram.com/p/C5g6PNexLJ1/>

Enthusiastic to participate in Paris

Fourth-semester student Elisa Nieto says that participating in the international competition in Paris is an **opportunity** to demonstrate what the team can achieve through research.

“It’s an opportunity to accomplish something using what we have developed and learned,” said the Tabasco native.

Advising professor César Puente said that it was **a source of pride** to see how the Monterrey campus team overcome obstacles.

*“You see them grow and develop; it makes me happy to know that they’re turning into professionals. They’re **good people**,”* said Puente.

<https://www.instagram.com/p/C-RUfCZMTGw/>

Generating social impact

Furthermore, the team have developed **Alkali** in collaboration with [Sociedad Sostenible AC](#) (SOSAC). This is a project that produces **samples** used to check water quality as part of the [Arroyo Vivo](#) project.

The project seeks to revitalize Arroyo Seco, one of the few natural bodies of water that still exists in the Monterrey metropolitan area.

*“We’re taking samples and measuring different parameters at different points to analyze the **water quality** at specific times and days in different locations so we can make a comparison,”* Mi Dam said.

SOSAC is a non-governmental organization that works to improve the relationship between people and their social and ecological environment.

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