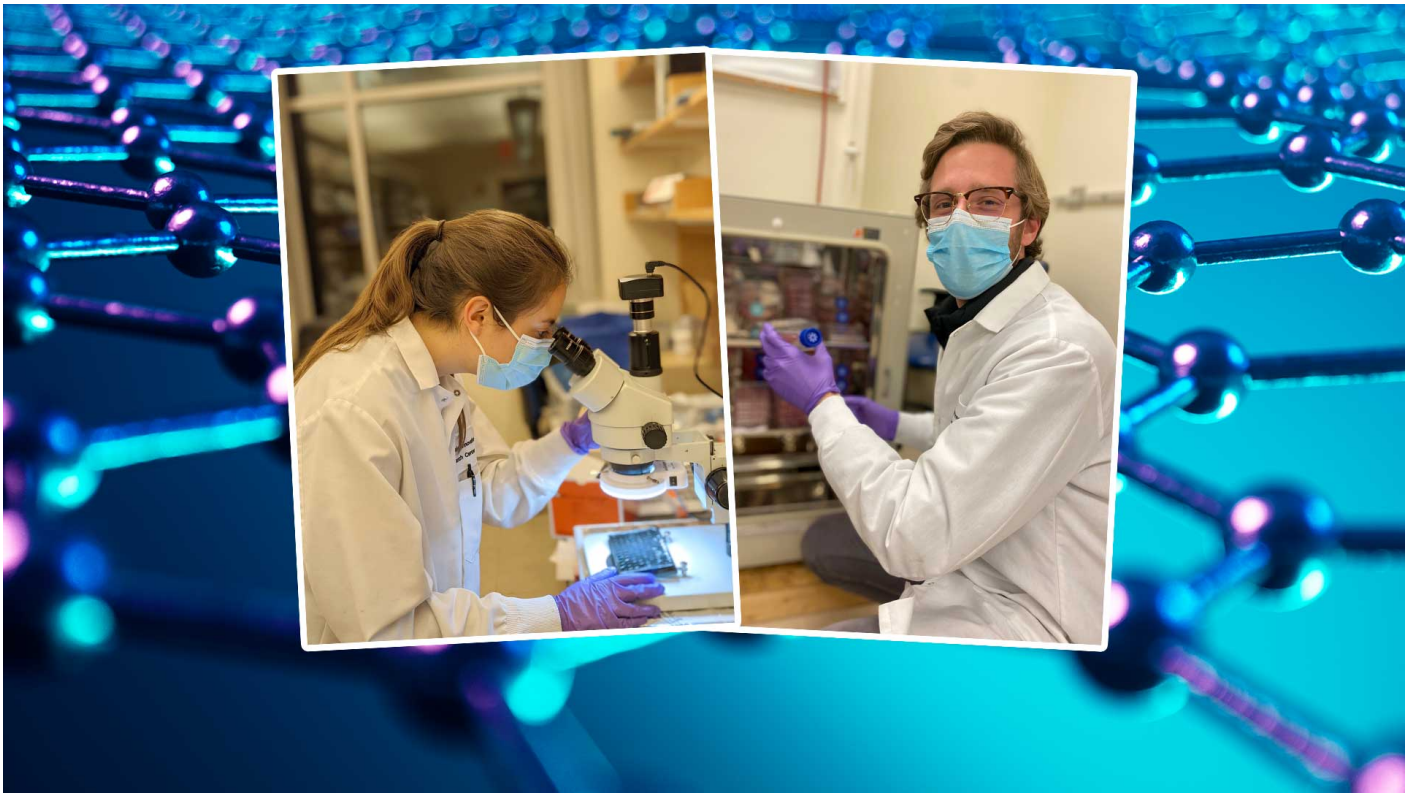
Nanotechnology vs cancer: Research aiming to fight metastasis

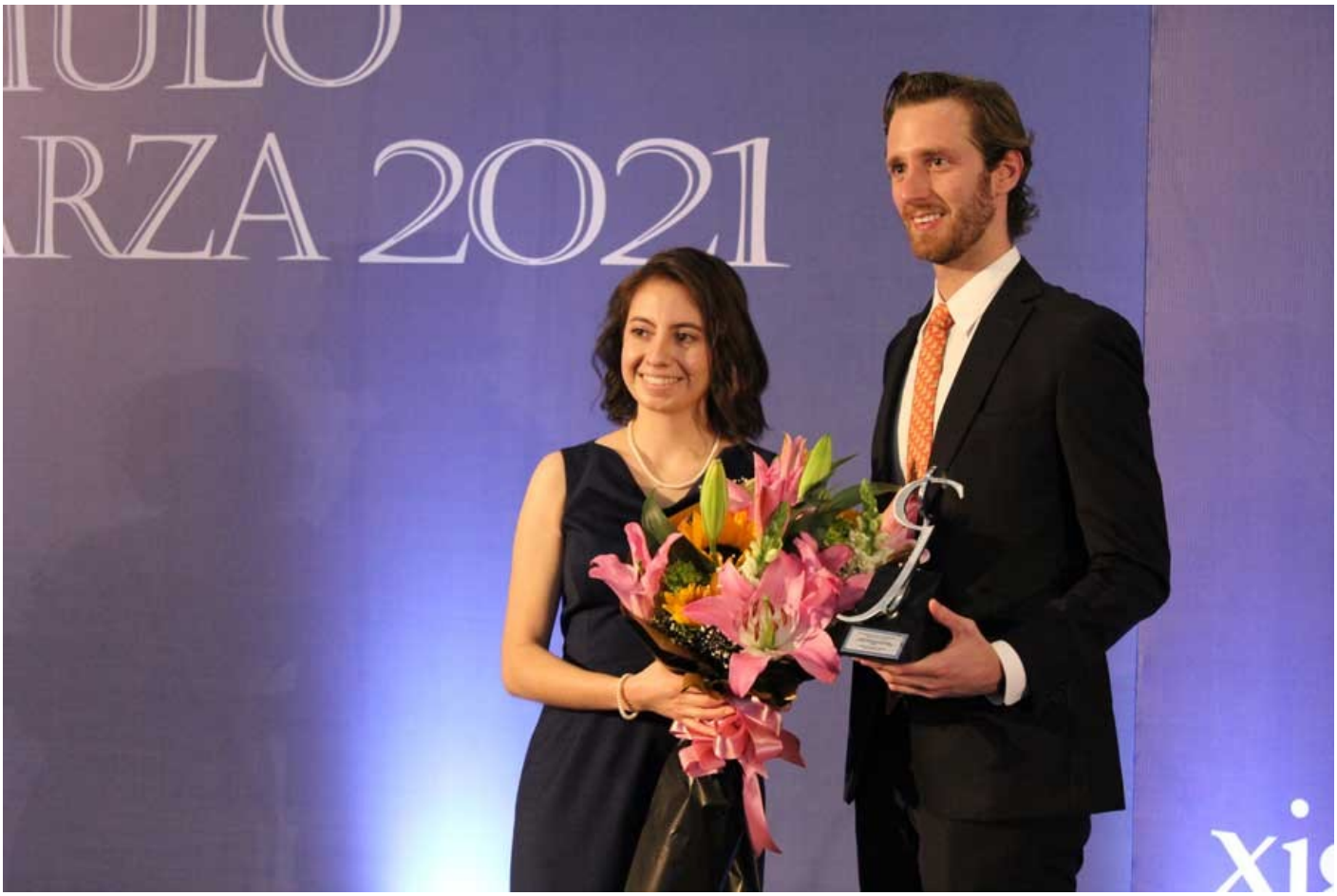


Michaela Prado and **Cristóbal Riojas** have been given the **Rómulo Garza Award** at **undergraduate** level for their **contribution to science** through their **research** project on the **treatment of metastatic cancer** using **nanotechnology**.

The **Tec graduate** in **Chemical Sciences and Nanotechnology Engineering** and the student of **Biotechnology Engineering** are working to **fight** this type of cancer, which is notable for **spreading** from its point of **origin** to **other parts of the body**.

*“We developed a platform using **two types** of nanoparticles linked by a chemical bond designed to separate within the microenvironment of a tumor.*

*“This will allow the formation of **nanohydrogels**, which are responsible for **releasing drugs** into the tumors,”* said the **Monterrey** campus **graduate**.



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“We asked ourselves, ‘How can we take advantage of hydrogels, which are already used for local drug delivery, but in metastasis?’ That’s what inspired our project.” - Michaela Prado

Doing their research at MIT

The title of the research undertaken by Michaela and Cristóbal is ***‘Dual-Nanoparticle System for Enhanced Drug Accumulation and Prolonged Retention in Metastatic Cancers.’***

They **collaborated** on this research during their **stay** at the **Massachusetts Institute of Technology (MIT)**, in **Boston**, **USA**.

*“The laboratory where we work specializes in **biomaterials**, specifically hydrogels.*

*“We asked ourselves, ‘How can we **take advantage** of hydrogels, which are already used for local drug delivery, but in **metastasis**?’ That’s what inspired our project,”* explained Michaela.

Michaela Prado has participated in the **research stay** since **2020**, while **Cristóbal Riojas** joined the team in **2021**.

In order **to qualify** for the stay, the young people had to **respond to a call** for researchers at the **Brigham and Women’s Hospital**, **MIT**, and **Boston Children’s Hospital.**

The duration of the stays **varies from 6 months to 1 year.**

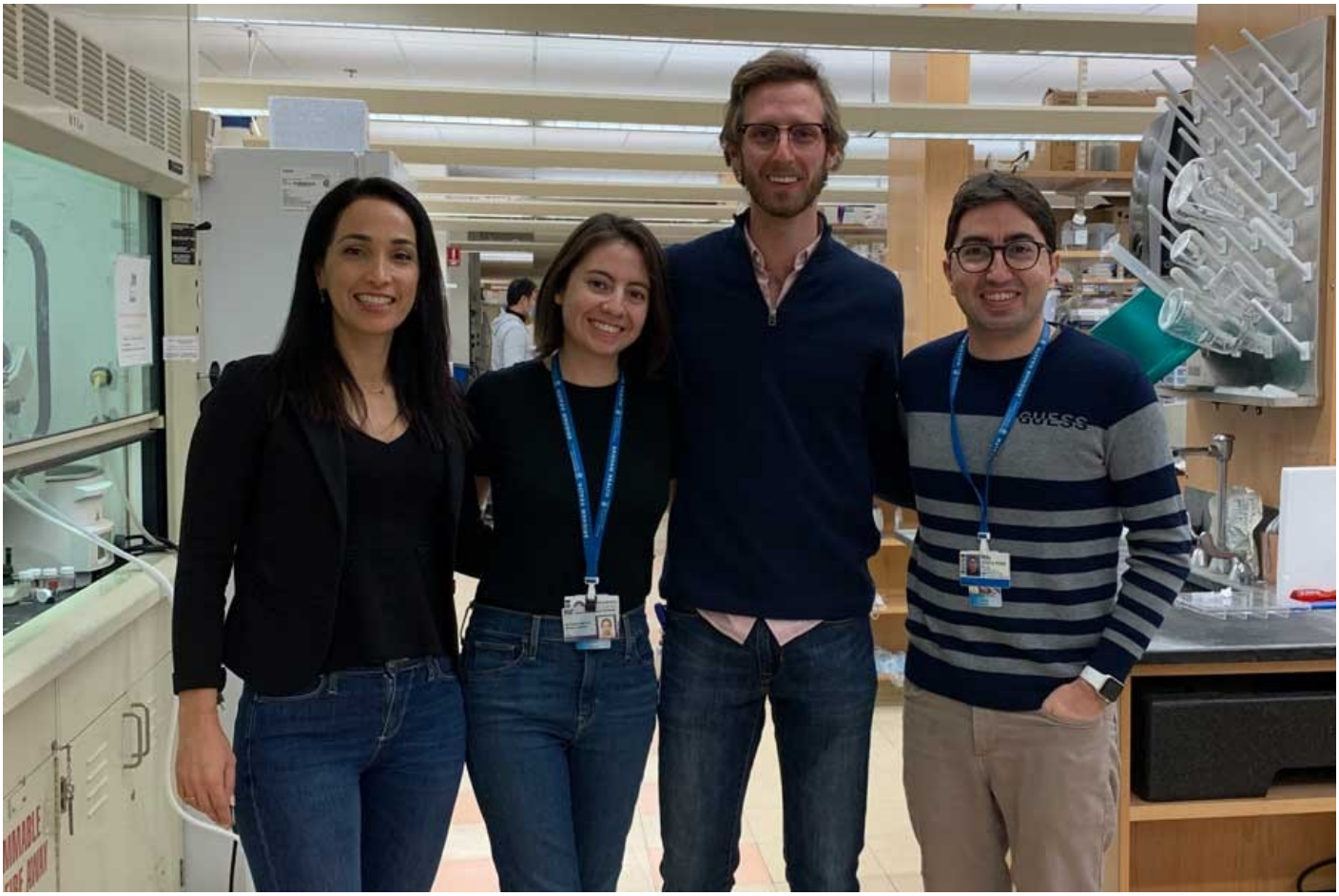
“It’s a wonderful recognition and honor (the award). Plus, it’s something that recognizes the work and what we’ve been doing.” - Cristóbal Riojas

Defining research stages

We began the **research from a chemical perspective,** understanding the **characteristics of nanoparticles,** explained **Cristóbal Riojas,** a student at the **Guadalajara campus**.

*“After looking at all the **theoretical nanoparticle design**, we moved on to in-vitro testing, which is when you begin testing cellular responses to the nanoparticle.*

*“Once we get these results, we can move on to in-vivo testing, which means the nanoparticles are tested on animals with metastatic cancers in order see **how they respond to the treatment**”,* confirmed the student.



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We have to see that our **design** is really **effective and efficient**, so that when we start **in-vivo** testing, we can **optimize the process** and gradually **improve the characteristics** of our **nanoparticle** platform, he explained.

Right now, the project **is in the in-vivo testing stage,** in which tests are being performed **on animals with metastatic cancers.** They hope to **publish** their results in an indexed research journal in the coming months.

Recognizing their innovative vision

The **Rómulo Garza Award** is presented by **Tecnológico de Monterrey and the Xignux** company to reward **research** carried out by **teachers and students** at **high school, undergraduate, and graduate levels**.

Both students **were given the award** at an **in-person ceremony** held on **March 2** at the Monterrey campus.

*"We owe part of this award to **Dr. Natalie Artzi** and **Dr. Pere Dosta Pons** at MIT, as well as **Dr. Marcelo Videa**, a professor at the Tec's **School of Science and Engineering**,"* said Michaela.

*"Obviously, it's a wonderful **recognition and honor**. Plus, it's something that **recognizes** the work and what we've been doing,"* added Cristóbal.

With information from Karla Rosales

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