Her dedication to research is taking her to study at Oxford

Elly Robles is graduating after undertaking international research stays and will now be able to study for a Ph.D. in England to help seek a cure for Parkinson's disease.
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Luis Mario García & Elly Robles

During her undergraduate studies, **Elly Robles** worked on finding a cure for **Parkinson's** disease, research that she will continue in her **Ph.D. studies** at the **University of Oxford.**

The **Nanotechnology Engineering** graduate became interested in **neurosciences,** with the aim of providing a better quality of life for people suffering from this disease.

"*To me, the brain is a mystery. A few years back, my grandfather was diagnosed with Parkinson's and I didn't understand how a disease that is in the brain could make your hand or foot move,*" said the Monterrey native.

Robles collaborated in **several research groups** at the **Monterrey campus** and had different international internships, in addition to presenting her projects at conferences in different countries.

Elly Robles undertook two international research stays, one of them in Ireland.

Entering the world of research

Elly considered studying business before enrolling at the **Monterrey campus**, but a summer camp while studying at **UANL High School No. 15** motivated her to pursue science.

“There was a chemistry contest that made me want to study science. I was invited to participate in the Chemistry Olympiad when I was still thinking about studying business, marketing, or something similar,” she recalled.

“I felt like I was doing magic in the lab, experimenting with things, making something change color or create smoke.”

She participated in the **Chemistry Olympiad** and, to her surprise, won **third place in her state.**

“*Those were my early chemistry attempts. I entered a lab for the first time and was given classes on advanced chemistry, physical chemistry, analytical chemistry, and organic chemistry. I fell in love with it,”* she said.

After an internship at the **Technological Research and Innovation Park (PIIT for its initials in Spanish),** she switched to **nanotechnology** a week after starting her studies at the **Tec**.

“*I felt like I was doing magic in the lab, experimenting with things, making something change color or create smoke; it’s very beautiful,”* she said.

Elly Robles is researching nanoparticles to find a cure for Parkinson's disease.

Experience at the Tec

Already a student at the **Monterrey campus**, Elly sought out research groups to join so she could begin to **better understand nanoparticles.**

She joined **Jorge Luis Cholula's** research group, then joined researchers **Roberto Parra and Eduardo Sosa** in a **biotechnology** group.

It was there that she learned **how to synthesize nanoparticles and do cell culture**, but she still wanted to do research on neurons and **Parkinson's** disease.

"*The science conducted at the Tec does study cells: skin cells and heart cells, but there's nothing about neurons, which are my specialty and what I needed to get into neuroscience,"* she explained.

Eventually, it was **Dr. Daniel Martinez** from **TecSalud**, a neurologist specializing in **Parkinson's**, who introduced her to this world.

> ***"I managed to modify nanoparticles from 1 to 3 nanometers. We confirmed them microscopically."***

"*The introduction to Neurology was incredible. Jorge accepted me very openly. With him, I learned that the pathology of Parkinson's is not only chemical but also physiological*.

"*With neurons, certain processes are denervated, which is what happens in neurodegeneration. This is what Jorge were working hard on for a year,"* said the Monterrey native.

Thanks to these research projects, Elly has completed several international internships, such as at the **University of Cork**, Ireland, and the **University of**

Oxford, England, where she began to shape the work that would lead to her Ph.D.

“*In that lab, you can combine skin cells with neurotransmitters and grow them in a little dish, turning them into neurons*.

“*You can transform skin cells into neurons by modifying their environment. This technique is an incredible tool because they can take neurons directly from patients, with all the genetic evolution of actual patients*,” she said.

Additionally**, she has presented her work at Rice University in Houston, as well as in Portugal and Spain. In July, she was accepted for a place at a conference in Budapest, Hungary. She has also published a research paper**.

Aiming to cure Parkinson’s disease

Elly has developed a treatment based on **gold nanoparticles** that **would help reverse the damage of Parkinson’s disease** upon entering the brain matter.

One of the main challenges she faced in this task was to **produce nanoparticles of 1 to 3 nanometers.**

“*I need something very small that can pass through the blood-brain barrier, which is a membrane that covers the brain to prevent toxins from entering. This is the same barrier that neuronal drugs are unable to penetrate, reducing their effectiveness*.

“*I attempted to synthesize them, modified one, and achieved nanoparticles of 1 to 3 nanometers. We confirmed them microscopically,*” she said.

Elly will be able to continue her Ph.D. research in **Oxford** after graduating from **Tec de Monterrey**.

Parkinson’s disease

Currently, **levodopa** is the only drug that is used to treat **Parkinson’s disease**, which occurs when a toxin reaches the **mitochondria**, the part of the brain that produces energy, and breaks it down.

This results **in an imbalance of metabolic cycles,** manifesting as **motor symptoms such as slowness of movement, tremors, stiffness, and loss of balance**.

There are other complications, such as **cognitive impairment, mental and sleep disorders, pain, and sensory disturbances**.

“I didn’t understand how a disease that is in the brain (Parkinson’s) could make you move your hand or foot.”

As the disease affects many people in rural communities, **Elly Robles** aims to make her treatment accessible to all people with this disease if it is successful.

“*A large number of patients come from rural communities where they drink well water, which often has some pesticide or chemical in it*.

“*I’ve made efforts during the development to make it a tool not only for people with money but so that it is accessible to everyone,*” said Robles.

Elly is part of the 125th graduating class during Tec de Monterrey’s **80th Anniversary.**

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