

# Mexican seeks to innovate on catheters to treat heart problems



**Dr. Ramsés Galaz**, an engineer and [Tec de Monterrey](#) professor at the North Sonora campus, will be working on creating a **catheter for heart surgery**, which could help in complex procedures and save lives.

The **18th meeting of the Mexico-Quebec Working Group** selected this innovative project for **funding** from Quebec's Ministry of International Relations and La Francophonie ([MRIF](#)).

This project seeks to **enhance the catheters** that are inserted into **arteries** to unblock them when they're clogged and prevent heart attacks, tissue damage, or death.

*"In some cases, you can't even get through. Sometimes, patients can't be treated and there's no blood flow. The project we're going to develop is a **reinforced catheter** that allows us to get through difficult and complex lesions,"* says Galaz.

Ramsés is the founder of [GSE Biomedical](#), a company that develops medical technologies and devices. He also works at [Nanostent](#) in **Quebec**, so both companies will be working on the catheter for cardiovascular surgery.

Ramsés trabajará junto con socios en Quebec para hacer más eficientes los catéteres width="900" loading="lazy">

## Here's how the catheter would work

Ramsés explains that catheters currently **tend to be thinner**, to facilitate **maneuvering** inside **arteries**, which also makes them **less rigid**.

*“When there’s a **coronary artery lesion** (...) **thrombosis** occurs, which causes the artery to become clogged and prevents blood from reaching the heart tissue. It’s the precursor to a **heart attack**,”* says Ramsés.

Occasionally, he explains, there are very severe or calcified lesions that close off the artery. Sometimes, there’s only a **small gap that’s very difficult to get through**. When you add the use of ever thinner catheters, it makes the procedure more complex for cardiologists.

*“When (...) **thrombosis** occurs, it causes the artery to become clogged and prevents blood from reaching the heart tissue. It’s the precursor to a heart attack.”*

The **lack of rigidity** in **catheters** is the area of opportunity that Ramsés **will look to innovate on** with his company GSE Biomedical and the Nanostent company in Quebec.

*“We aren’t reinventing the wheel. The procedures remain the same; insert the catheter, go into the artery, then go through the lesion with a thin wire, and then apply pressure on the constriction in the artery.*

*“We need to make **adjustments to the structure and materials** to reinforce that area and be able to go through the lesion. Once this happens, the normal procedure can be followed,”* Ramsés says.

What’s more, he added that they will seek to make this reinforcement **compatible with any catheter**, making it more accessible.

La falta de rigidez en los catéteres es el área de oportunidad que Ramsés con su empresa GSE Biomedical

## This is how the partnership between Mexico and Quebec was formed

Ramsés completed his **graduate education** in **Canada**, where he studied for a master’s degree in Mechanical Engineering and a PhD in Biomedical Engineering, after graduating from [Tec de Monterrey](#) with a degree in **Mechanical Engineering and Administration**.

Upon finishing his PhD, he returned to Mexico, where he started his company **GSE Biomedical**, which develops medical devices.

*“We have a lot of projects. I started my business and maintained my relationship with Quebec,”* Galaz said.

In 2018, when he was already developing **stent** technology (tiny tubes placed into a hollow structure inside the body such as arteries or veins), Ramsés was invited to work at **Nanostent**, a Quebec-based company.

Together with Nanostent and GSE Biomedical, Ramsés participated in a call from the Directorate General of Project Operations in Mexico at the **Mexican Agency for International Development Cooperation (AMEXCID)**.

This call includes 9 innovation and research projects, with Ramsés being selected along with **businessman Olivier Bertrand** from *Les Entreprises Nanostent* in Quebec.

The projects selected in this call will obtain funding of up to **8,000 Canadian dollars** during the **first year of work**, with the possibility of obtaining an **additional 8,000** when evaluated during the second year.

*“The advantage we have with Nanostent is that Dr. Bertrand has a lot of **contacts** across the world.*

*“So, the devices we develop are going to be presented in **Europe, America, and Asia**. He’s someone who is going to give us visibility,”* said Ramsés.

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Ramsés realizó sus estudios de posgrado en Canadá, estudiando una maestría en Ingeniería Mecánica y

### **Seeking advances in medicine through engineering**

During his career, Ramsés has worked on the development of various medical devices such as **ZipTek**, a surgical button that replaces the traditional suture method in surgeries, for which he was given the **INCmty Health Innovation Award**.

Similarly, he worked with his company GSE Biomedical on the creation of an [emergency ventilator for providing artificial respiration to COVID patients](#), in conjunction with **FEMSA, Metalsa, Coppel**, and **Tec de Monterrey**.

*“I also have the idea of **setting up a research center**, perhaps on a Tec campus.*

*“I don’t want to say either that I only want to devote myself to the cardiovascular area. We also have projects in **gynecology, blood tests, and orthopedic surgery**,”* says Ramsés.

He’s worked at **Tec de Monterrey** for **14 years** as a **professor of Biomedical Engineering** on various campuses such as North Sonora and Mexico City.

*“I tell my students to devote themselves to something they’re studying. I tell them how this world of medical devices works, and some have gone on to this area. We’ve even sent **students abroad** for **graduate** studies.*

*“When we talk about leaving a **legacy**, there have been thousands of surgeries with devices such as Ziptek or the ventilator. The teaching part is a legacy, the business part is another, but it’s also*

*the power to change and save people's lives,"* concludes Ramsés.

Ramsés participó en la convocatoria de la Dirección General de Operación de Proyectos en México  
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