

Milestone for Mexico: oriGen project gathers 100,000 genetic records



The oriGen project is the first study of the Latino population's demographic and epidemiological characteristics.

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AFP

Alejandro Salazar

One hundred thousand Mexicans now form part of a **genetic map** drawn by the [**oriGen project**](#), which is **the most representative genomic database of the Mexican and Latin American population in history**.

Through [**TecSalud**](#), the **Tecnológico de Monterrey Education Group** announced that **oriGen** has achieved its **participation goal of 100,000 volunteers** after almost three years of field work in nineteen Mexican states.

Genetic, clinical, and epidemiological data were collected from these volunteers, which will allow researchers to study conditions that affect Latino populations, such as **diabetes, obesity**, and certain types of **cancer**.

Moreover, the aim is to understand the **origin of these chronic diseases**, as well as to project new lines of research, innovation, and development of medical solutions for the **prevention, diagnosis, and treatment** of these diseases.



Tecnológico de Monterrey Education Group leaders announced that the goal of 100,000 genetic samples from the Mexican population has been reached. Photo: Alejandro Salazar

During the **“oriGen 100K. Progress, Impact, and Future”** presentation held in the **Main Hall of the Rector’s Building** on September 9, [**David Garza**](#), Executive President of the Tecnológico de Monterrey Education Group commented:

*“The important thing about this project is not that we keep the data, but that **researchers from the Tec, from other universities and from different countries have access** to this infrastructure, which we want to share,”* he said.

“At the Tecnológico de Monterrey Education Group, we believe in goal-oriented science and the oriGen project is a clear example of this: an initiative by means of

which we innovate and commit ourselves to the wellbeing of society,” Garza added.

For TecSalud rector **Guillermo Torre**, the oriGen project has only just begun to show its potential:

*“In ten years, we’ll have **companies that stemmed from oriGen** conducting predictive, genomic studies. Companies that develop medicines of particular benefit to Latinos and not only Anglo populations.”*

Torre pointed out that one of the **strategic priorities in health towards 2030** is to promote applied research and oriGen is a **watershed** for the generation of valuable knowledge.

*“Completing this stage is not an end, but a new beginning; what follows is the **analysis, sequencing, generation of knowledge** and, most importantly, its **application** to improve the prevention, diagnosis, and treatment of ailments that affect millions of people,” Torre said.*

Pablo Kuri, oriGen’s director, started the presentation by showing project figures.

*“We used to think **our future** was in **the stars**, but now we know it’s in our **genes**,” Kuri said, quoting the words of **James Watson**, who is considered to be the father of genomics.*

“We used to think our future was in the stars, but now we know it’s in our genes.”

David Garza, Executive President of the Tecnológico de Monterrey Education Group. Photo: Alejandro Salazar



Mexican DNA

Sergio Iván Valdés Ferrer, General Director of Health Research Policies and TecSalud professor on the Mexico City campus, said that this is a **milestone**, not only for the Tec de Monterrey, **but for the country**.

*"The human genome was first sequenced twenty-five years ago. Now our work is to obtain data from 100,000 people, which will help us to do more **in-depth mapping** of the **predispositions Mexicans have** to certain pathologies."*

Torre hopes that new therapies will be discovered in the future for some of the very particular problems Mexicans or Hispanics living in the United States experience.

*"If you asked me what the most important finding is, I would highlight **how the oriGen data resulted in a new treatment** I believe to be feasible that impacts and changes one of the most important causes of mortality in Mexicans," Torre said.*

The rector of TecSalud said that in the short term there will be **scientific publications** on the subject, and in the long term he foresees the emergence of a company that will generate high economic value thereby enabling much more research in the future.

“In ten years, we’ll have companies that stemmed from oriGen conducting predictive, genomic studies.”



Participants filled out questionnaires of as many as five hundred questions and gave blood, plasma, and DNA samples. / Photo: TecScience

Deciphering the Mexican genome

The [oriGen project](#) seeks to decipher the **Mexican genome** and gain an accurate understanding of the **genetic components associated with the most common diseases** in the country.

As part of the agreement signed in 2023 by the **Tec** and the **Regeneron GeneticsCenter**, 100,000 samples will be sent to **Regeneron** for exome sequencing of which 10,000 will be selected for **whole genome sequencing**.

This information will enable a genetic imputation process to be applied to infer genomic data from the rest of the participants.

All of this is contemplated in the [agreement executed with Regeneron](#). According to Pablo Kuri, director of oriGen:

“This is the most important agreement ever signed by the Tec, not only because of the volume of samples that will be processed, but also because of access to world-class sequencing technology and the estimated 42-million-dollar savings it represents for the institution.”

Currently, **500,000 test tubes** (five phase separations for each individual, [oriGen's](#) raw materials) are stored in ultra low-temperature freezers at the **Zambrano Hellion Hospital** and in the **Expedition FEMSA** building.

Of that pool, **70,000 samples have already been sent to the [Regeneron Genetics Center](#)** in New Jersey, **and results have been received for 30,000**.

The goal is to complete the shipment before the end of 2025, thereby processing **100,000 exomes** and **10,000 whole genomes**.

The final results will be ready during the first semester of 2026.

Guillermo Torre, TecSalud rector. Photo: Alejandro Salazar



What precisely is it that is sequenced?

The **exome** is the part of the **DNA (deoxyribonucleic acid)** that contains the instructions for producing proteins, which is less than 2% of the genome but **where most disease-related variants are concentrated**.

DNA is the molecule containing the genetic information of living beings that determines how they function, grow, reproduce, and transmit characteristics from parents to offspring.

The **whole genome**, on the other hand, encompasses the entire DNA and provides a comprehensive view of genetic information.

By combining both levels, oriGen will be able to analyze everything from the most **well-known mutations** to regulatory factors that influence health.

Consequently, the genetic information of Mexicans in the study will not only be available for national projects but will also **be able to be included in global**

scientific forums, where data on Caucasians have been more commonly discussed.



Currently, 70,000 samples have already been sent to the Regeneron Genetics Center in New Jersey and 30,000 results have been received. / Photo: TecScience

Science knocking on your door

Reaching 100,000 samples involved visiting more than **357,000 homes in eighteen metropolitan areas in nineteen states.**

The process involved slightly more than **two and a half years of fieldwork** with teams that traveled across the country day after day.

This was made possible by setting up **seventeen temporary laboratories on Tec and Tecmilenio** campuses nationwide, where samples were received, processed, and stored under strict quality protocols.

There were about **eighty people** collecting samples in the field: team members, nurses, and drivers for the **thirty vehicles used in daily operations**.

This number was augmented by oriGen's core team of about **twenty individuals** dedicated to coordinating logistics, supervising laboratories, and processing data.

“In ten years, we’ll have companies that stemmed from oriGen conducting predictive, genomic studies.” - Guillermo Torre, rector of TecSalud

Pablo Kuri, oriGen project director. Photo: Alejandro Salazar



Participants filled out questionnaires of as many as **five hundred questions** and gave blood, plasma, and DNA samples.

They were not hospital patients, but ordinary citizens, which ensures that **the data reflect the actual health of Mexico.**

In fact, **early outcomes agree with the [National Health Survey \(ENSANUT](#)**, Spanish acronym) which confirms its representativity and reliability.

Moreover, according to project director Pablo Kuri, the quality of the sample has been productive:

“None of the samples sent to Regeneron have been rejected, which **speaks to the quality of all the field work and sample handling.**”

The study gathered environmental data, including housing and living conditions, which will enable the **exposome** to be measured; in other words, genetic and health characteristics, in addition to participants’ social and environmental determinants to enrich the analysis.

The oriGen Project was conducted **in coordination** with health secretariats, heads of health jurisdictions, municipal presidents, and local authorities.

It was carried out pursuant to different regulatory agency guidelines and **applicable regulatory and ethical provisions.**



There were about eighty people collecting samples in the field: team members, nurses, and drivers for the thirty vehicles used in daily operations. / Photo: TecScience

A map that was missing

Why is oriGen an unprecedented milestone? On a global scale, **95% of genomic studies** have been conducted on Caucasians and only a tiny fraction on Latinos.

There are only **twenty-five to thirty projects of this magnitude** worldwide.

In Latin America, the only comparable project is the [**Mexico City Prospective Study**](#) of 140,000 individuals although it is limited to two municipalities and people over the age of thirty-five.

The oriGen project breaks down these barriers: it comprises adults who are at least **eighteen years old** and pools the full range of diversity found in Mexico.

"It is, without a doubt, the most representative study we have of the Latino and Mexican populations," Kuri states.}

About oriGen

[TecSalud](#) (the [Tec de Monterrey](#) health system) launched the [oriGen](#) initiative in 2021 to decipher the **Mexican genome** and accurately understand the **genetic components associated with the most common diseases** in the country.

The project will **sequence the DNA of 100,000 Mexicans**, an **unprecedented initiative in Latin America**, said Guillermo Torre, rector of [TecSalud](#) and vice-president of Research at the Tec.

*“Collective information will enable us **to find real solutions** to the **most important health problems in Mexico**,”* he said during the presentation of the oriGen project.

The project currently collaborates with Tec de Monterrey’s **Institute for Obesity Research** and the **School of Medicine and Health Sciences**.

In the future, alliances will be sought with leading public and private institutions in the educational and health sectors to strengthen the country’s scientific development, as well as with international universities and top-level pharmaceutical laboratories.

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