INMEGEN (National Institute for Genomic Medicine) – Dr Xavier Soberon Mainero, General Director – Mexico



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Tags: research

Genomic medicine is gaining momentum. The general director of the institute founded in 2004 explains how genomics is helping unlocking the secret codes, which will help understand and treat pathologies affecting the Mexican population such as diabetes.

What have been the three main priorities of the Institute since you took office as general director in 2009?

The main priorities of Inmegen are aligned with the main goal of the institute: research in the field of genomics. Our R&D efforts are focused on unlocking the genomic traits and characteristics of the Mexican population. For example, we discovered that 80 percent of Mexicans have at least 30 percent of indigenous genes, with the remainder mainly of Spanish descent. At INMEGEN we work with world-class scientists to unravel the secrets of genes and research into areas that can help us discover who we are genetically and use this knowledge to treat pathologies. We want knowledge to be useful for practical purposes and support translation into useful products. Currently we are heading an initiative on procedures for the molecular diagnostics of cancer. As we advance in our product development, we see the private sector becoming much more interested in working with us.

Our research has led us to develop four main areas: cancer, infectious diseases, metabolic diseases (non-communicable diseases such as obesity, diabetes, cardiovascular diseases, nutrigenomics)

and, finally, psychiatric conditions (depression, addictions, among others). Genomic approaches are more holistic, as opposed to the classic reductionist scientific approach that prevails in contemporary medicine. We need to approach the whole system instead of focusing only on single parts or components.

What is the current awareness of genomic medicine in Mexico and what needs to be improved?

Most areas in the health sector are not well informed and naïve about the true importance and significance of the human genome. We need to push harder in order to get healthcare professionals more interested in this topic and make them understand its importance. I believe in the future medicine will be divided into before and after the genome, but we are several decades away from this moment, so we have a lot of work to do!

We have some “transversal” areas of interest, such as population genetics, systems biology, pharmacogenomics (the study of the role of genetics in drug response) and epigenomics (the study of stable changes that are not caused by changes in the DNA sequence). Applying these discoveries to improve the health of the Mexican population means better patient classification, designing more efficient treatments, detecting and preventing diseases at an early stage, among other advances. In each of those areas, there are huge opportunities; we just have to recognize them as such along with clinicians and relevant institutions. Today, we mainly talk about infectious diseases and cancer, but in the future there will be a list of significant issues to overcome. We will need to have more convergence and communication with health professionals: they need to be updated to the latest discoveries and developments.

The institute focuses on 21 R&D lines mainly related with pathologies which nowadays represent the most important burden of disease for Mexico, such as diabetes and obesity. What is the status of research on genomics in these fields? What was the latest and most important recent development in Mexico with regard to genomics?

Last year we took part in a very important study that discovered gene variants that were totally unknown to the scientific world at the time and are related to diabetes. The variants we discovered are related to the incidence of diabetes in Latin America and certain Asian populations, but not for Europeans. This doesn’t mean we have a cure, as we are still at a more basic discovery stage, but these are the largest and most important Latin American genomic discoveries to date and will help us better understand how to treat diabetes in the population.

Inmegen recently published papers related to cancer. Mexico has true experts in the field of breast cancer genomics – we've had real, world-class level contributions in this area. Our main goal is to develop the first ad hoc molecular diagnostics for cancer for our health system, but this process will mature in the year 2015.

How is the institute collaborating with the Ministry of Health in the field of genomics?

Since we are the leading experts in the field, we are official advisors to the Ministry, provide courses to the medical community and give advice to non-professionals as well as to the general population. We have an outreach program in which general population can have access to information in a more enjoyable way, such as through infographics and comics. The government gives us full confidence because they know how we work.

Inmegen relies on the only certified technology transfer office within a public health institution to translate R&D into patented technology and processes. Do you actively collaborate with the private sector?

We have not fully ventured in this area yet, but it is definitely something that is under consideration because it's a way of doing business we need. We currently have a board of trustees, comprised of a group of prominent people who represent and have direct relationships with non-governmental organizations as well as private companies. We have worked with the private sector in rather creative ways like philanthropic and charity work with the Slim Institute. We must acknowledge that these are not business relationships but pure results-based discovery financing. We currently have a few smaller projects for non-communicable diseases with private companies.

There are two main actors for innovation: pushers (academia) and pullers (business). Business needs solutions for certain issues; academic and researching teams are always one step ahead in terms of discovery but still need resources and financing to make any project thrive. The most important aspect in this relationship is communication; this is why you need people in the middle ground for both parties. So far, we have pulled or attracted people to come here and get familiar with the latest technologies. One of our main projects will be to marry genomics with state-of-the-art clinical trials. We need to convince the authorities and academic centers of the importance of this research.

In terms of recruiting talent, we want to attract young top quality genomicists, not only in the health area. Our goal is to have ten genomicists coming back from premiere institutions world-wide each year. We need to offer them interesting jobs, or they will remain abroad. The program is intended to run for ten years, for a total of 100 young scientists recruited.

What is your personal priority for the coming years?

I have a dream and that is to make Mexico a true player in genomics. We are not lagging behind today, as it is a relatively recent field of study. One of our main distinctive features as a country is biological diversity, both human and non-human; the differences in genetic makeup in our country are astounding: if you compare, for example, someone from the northern region of Mexico with someone from the South, you may encounter bigger genetic differences than the ones found between Asians and Europeans. These come from the indigenous component, rooted on common ancestry that goes back 15,000 years. The best and most efficient way to understand such diversity is with the tools of genomics and we need to make everyone understand that.

I've been in this field for 30 years and this is the first time I can perceive a real tangible change in three areas. First, the industry is becoming truly interested in innovation, as they look at it as a necessity. Second, academics are changing, as they are turning to the usefulness of their knowledge. Third, the government is incrementing the funds for science. It has only happened for two years so far, but if we keep this trend, real change will manifest itself.

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