Mexico launches bold genome project

Mexico has launched a race-based genome project to determine if a genetic basis exists for its growing health crisis. The goal is to glean insights into genetic differences, believed to be unique to its population, that may play a key role in chronic diseases like asthma, diabetes and hypertension.

Several life sciences firms, including Applied Biosystems (ABI) of Foster City, California, Somers, NY-based IBM Healthcare and Life Sciences and Affymetrix of Santa Clara, California, will assist the government in sequencing, genotyping and data analysis. The Instituto Nacional de Medicina Genomica (National Genomic Medicine Institute of Mexico, or INMEGEN) will manage the resulting 'Mexican HapMap.' The head of the US National Human Genome Research Institute, Francis Collins, who led the international public consortium that deciphered the human genetic code, will provide unpaid advice to INMEGEN on scientific and ethical issues.

Experienced genomicist Gerardo Jimenez will direct Mexico's new race-based genotyping project.

According to Gerardo Jimenez, director of INMEGEN and the new collaboration, INMEGEN will begin by sampling individuals in six remote regions of Mexico to construct a consensus genetic map that fits the entire Mexican *mestizo* population, a mixture of Europeans (mainly Spaniards) and Indians. The first objective is to determine if every block of nucleic acid sequence will be alike for all the Mexican groups. "My own prediction," says Jimenez, "is that we are not going to find huge differences."

INMEGEN will release newly mined genomic data into the public domain as fast as technology allows, but Jimenez is quick to point out that the measure of the project's success is not the science, but rather the medicines that come out of it. He also envisions the initiative—the largest genotyping study ever launched in Latin America—having value beyond his country's borders, informing public health research and drug discovery throughout *mestizo* countries. To that end, INMEGEN will seek alliances with other Latin American regions in the near future.

The collaboration's brain trust also hopes to attain the distinction of being the first genome research effort to avoid, or at least avert, the thorny ethical issues that at times overshadowed the work of the international human genome project. Indeed, INMEGEN's choice to collaborate with US biotechs is intentional. The close economic and political ties between the two nations lends a degree of legitimacy and accountability to the project, and Jimenez, an experienced genomics researcher, is well aware of the social implications of genomics analysis.

Collins, for his part, often found himself playing the role of head of the genome morality police during fierce Genome Project debates in 2000 and 2001. But he's confident that Jimenez will keep the public informed and safe from those who'd seek to use genetic data to stigmatize or discriminate against certain members of society. Mexico is a multicultural society where racial prejudices persist—a point not lost on its bioethicists, medical community and media.

"Gerardo knows the challenges of using race as a research variable," Collins says, "which is why he and his staff are working hard to identify the ethical, political, legislative framework that needs to be put in place before the project even begins." Yet Collins is aware that like the international genome consortium, Mexico could well find itself pressing forward with the INMEGEN project before the public, government and industry reconcile differences over who controls data. "It would be unethical," he concedes, "to make the Mexican people wait indefinitely for the benefits of genomic research, until the ethicists and politicians squeeze out the last ounce of uncertainty in this kind of project.

INMEGEN's research will be subject to oversight as well as review by a panel comprising the country's leading academic bioethicists. The genomics project will be managed according to US National Institutes of Health ethical standards.

Jimenez says the genomic research protocol in Mexico already requires that samples taken must remain anonymous. However, both he and Collins acknowledge that a more comprehensive, gene-specific legal framework is needed to give donors multiple layers of confidentiality and anti-discrimination protections—and a clearly delineated set of options for redress should any of the donor data be mishandled or misused. At present, several bills are under consideration in the Mexican legislature.

Despite this promising start, some warn that even seemingly airtight laws and scientists' best intentions cannot ensure against abuses. According to Leon Olive of the National and Autonomous University of Mexico, a bioethics advisor to the Mexican Congress, "A project attempting to prove that there is a '*mestizo* genome' will fail if it pretends to correlate race and disease. Mestizo is a label, not a race," he explains. "One cannot generalize about the *mestizo* any more than one can make generalizations about Spaniards. Neither is ethnically homogeneous." Olive points out that Mexico has more than 60 different ethnic Indian groups which make up approximately 10% of the total population.

He fears that some might attempt to manipulate the INMEGEN's data to justify the stereotyping and stigmatization of certain ethnic groups that are already viewed as a considerable nuisance in Mexico, like the politically active indigenous peoples in Mexico's rural south. And for the time being, such critics have the ear of the legislature.

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