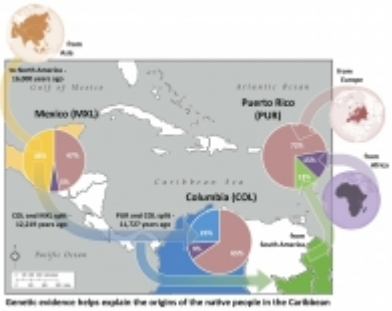
New details of Boricua genetics [1]

Submitted by Wilson Gonzalez-Espada [2] on 12 January 2014 - 5:29pm

 [2]

Rating:



By Dr. Taras Oleksyk, UPR Mayaguez

A recently published study used genetic analyses to confirm the South American origin of Taínos, the inhabitants of Puerto Rico before 1493. The research team, including several local collaborators, also pinpointed the average proportion of genetic material from Taíno, African, and European ancestors in a sample of people from Puerto Rico.

Each organism, even the simplest bacteria, has a unique genetic code, or genome. This genome has the instructions for all the organisms' physical and biochemical characteristics, and metabolic processes.

It has been a decade since the first draft of a single individual's human genome was published. The next step has been to characterize human genome variation, the differences between individuals, by comparing 2000 genomes from 26 worldwide populations.

For this project, an important sampling strategy is to include the genome of both parents and their offspring. This helps scientists to determine what genetic instructions come from each parent.

Thanks to the lobbying effort of scientists like Carlos Bustamante and Esteban Burchard, four Latino populations were included in the human genome project: Colombians in Medellín, Mexicans from Los Ángeles, Peruvians in Lima, and Puerto Ricans residents in the Island.

Now that the genome database is more complete, scientists can study the ancestors of current Latino groups and compare the data with historical records. Specifically for Puerto Ricans, the genome database helped to identify the pre-Columbian migrations that gave rise to the Taínos, as well as the historical migrations of Europeans and Africans in Puerto Rico.

These findings were recently published in the prestigious journal PLoS Genetics. Dr. Simon Gravel (McGill University), Dr. Taras Oleksyk, Dr. Juan C. Martínez-Cruzado (Biology Department, University of Puerto Rico at Mayaguez) and Dr. Julie Dutil (Biochemistry Department, Ponce School of Medicine) were the lead scientists in the preparation of this article. Postdoctoral researcher Dr. Juan Rodríguez-Flores and graduate student Wilfred Guiblet also collaborated in this study. The complete list of 20 authors and the article are available here:

http://www.plosgenetics.org/article/info%3Adoi%2F10.1371%2Fjournal.pgen.1004023 [3]

The scientists discovered that Puerto Ricans have a very high genetic variation. Compared with other Latino groups sampled, Puerto Ricans have the highest proportion of European genetic ancestry, about 72-75%. The rest of the genome came from indigenous groups (13%) and Africans (12-15%). For the European and African component of the Puerto Rican genome, the researchers found genetic evidence for two periods of migration, the first 15 generations ago (1520-1540), and the most recent period at 7 generations ago (1770-1790).

The regions of the Puerto Rican genome that come from Africa contain the most of the genetic variation. The many populations of Africans that were brought to the Caribbean as slaves explain the high variability.

On the other hand, the Native American segments have less variation. The genetic evidence supports the Southern source of migration for the Arawakan/Taíno people into Puerto Rico. The native people most related to the Taínos are still living in Brazil, and as far south as Bolivia and Paraguay. These groups separated genetically from Native Americans living in Mexico and Colombia 11,000-12,000 years ago.

The work of Simon Gravel, Taras Oleksyk, Juan C. Martínez-Cruzado, Julie Dutil and the rest of the research team is far from over. Currently, they are leading a large joint effort to study the genetic diversity of Puerto Ricans. The goal is to collect hundreds of DNA samples in the 78 municipalities of Puerto Rico, and generate genetic maps that describe the geographic distribution of genetic variants of importance, including those of Taíno, European and African origins.

Studies like this one are essential to bring potential benefits locally by improving diagnostics and developing better treatments, especially for illnesses that are more frequent among Puerto Ricans compared with other groups.

Categorías de Contenido:

- Biological and health sciences [4]

Podcast:

- Radiocápsulas CienciaPR [5]

Hot:

0.047111611628363

Source URL:https://www.cienciapr.org/en/podcasts/radiocapsulas-cienciapr/new-details-boricua-genetics?page=2

Links
[1] https://www.cienciapr.org/en/podcasts/radiocapsulas-cienciapr/new-details-boricua-genetics [2] https://www.cienciapr.org/en/user/wgepr [3] http://www.plosgenetics.org/article/info%3Adoi%2F10.1371%2Fjournal.pgen.1004023 [4] https://www.cienciapr.org/en/categorias-de-contenido/biological-and-health-sciences-0 [5] https://www.cienciapr.org/en/podcasts/radiocapsulas-cienciapr