

# Genome scan shows Polynesians have little genetic relationship to Melanesians

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The origins and current genetic relationships of Pacific Islanders have generated interest and controversy for many decades. Now, a new comprehensive genetic study of almost 1,000 individuals has revealed that Polynesians and Micronesians have almost no genetic relation to Melanesians, and that groups that live in the islands of Melanesia are remarkably diverse.

The study, “The Genetic Structure of Pacific Islanders,” is published in the January issue of *PLoS Genetics*. It involved researchers from Temple University, University of Maryland, Yale, Binghamton University, the Marshfield Clinic Research Foundation, Victoria University in New Zealand, Mackay Memorial Hospital in Taiwan, and the Institute for Medical Research in Papua New Guinea.

The researchers analyzed more than 800 genetic markers (highly informative microsatellites) in nearly 1,000 individuals from 41 Pacific populations, as opposed to prior small-scale mitochondrial DNA or Y chromosome studies, which had produced conflicting results.

“The first settlers of Australia, New Guinea, and the large islands just to the east arrived between 50,000 and 30,000 years ago, when Neanderthals still roamed Europe,” says Jonathan Friedlaender, professor emeritus of anthropology at Temple and the study’s lead author. “These small groups were isolated and became extremely diverse during the following tens of thousands of years. Then, a little more than 3,000 years ago, the ancestors of the Polynesians and Micronesians, with

their excellent sailing outrigger canoes, appeared in the islands of Melanesia, and during the following centuries settled the islands in the vast unknown regions of the central and eastern Pacific.

“Over the last 20 years there have been many hypotheses concerning where the ancestors of the Polynesians came from in Asia, how long it took them to develop their special seafaring abilities in Island Melanesia, and how much they interacted with the native Melanesian peoples there before they commenced their remarkable Diaspora across the unexplored islands in the Pacific,” he adds.

According to Friedlaender, one scenario called the ‘fast train hypothesis,’ which is supported by the mitochondrial evidence, suggests that ancestors of the Polynesians originated in Taiwan, moved through Indonesia to Island Melanesia, and then out into the unknown islands of the Pacific without having any significant contact with the Island Melanesians along the way. A counter argument called ‘slow boat hypothesis,’ which the Y chromosome evidence supports, suggests that the ancestors of the Polynesians were primarily Melanesians, and that there was very little Asian or Taiwanese influence. A third position, called the “entangled bank hypothesis,” suggests these ancient migrations simply can’t be accurately reconstructed by looking at the genetics of today’s populations, even in the context of the available archaeological evidence.

In their paper, the researchers state that their analysis is consistent with the scenario that the ancestors of Polynesians moved through Island Melanesia relatively rapidly and only intermixed to a very modest degree with the indigenous populations there.

“Our genetic analysis establishes that the Polynesians’ and Micronesians’ closest relationships are to Taiwan Aborigines and East Asians,” says Friedlaender. “Some groups in Island Melanesia who speak languages

related to Polynesian, called Austronesian or Oceanic languages, do show a small Polynesian genetic contribution, but it is very minor – never more than 20 percent.

“There clearly was a lot of cultural and language influence that occurred, but the amount of genetic exchange between the groups along the way was remarkably low,” he says. “From the genetic perspective, if the ancestral train from the Taiwan vicinity to Polynesia wasn’t an express, very few passengers climbed aboard or got off along the way.”

Friedlaender adds that this study also confirms and expands their findings from previous studies about the genetic diversity of Island Melanesians—among the most genetically diverse people on the planet, showing further that their diversity is neatly organized by island, island size, topography and language families.

Source: Temple University

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