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Division of Epidemiology, Human Genetics and Environmental Sciences

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## Human Genetics Center

# Genomic history of East Eurasian human populations based on modern and ancient DNA data

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East Eurasia was occupied by modern humans probably since ~50,000 years ago. We determined 86 complete human mitochondrial DNA sequences from four indigenous populations, including Negritos, in Malaysia, and also analyzed their genome-wide 50k SNP data. Based on these analyses, we proposed an “early train” human migration model for Southeast Asia (Jinam et al., 2012; *Mol. Biol. Evolution* 29:3513-3527). Jinam et al. (unpublished) recently compared all three Negrito groups in the Philippine Islands, Malay Peninsula, and Andaman Islands using ~1 million SNP data, and found some shared genetic components as well as high diversity among them. This result supports the classic idea that Negritos are remnants of the initial human dispersal to East Eurasia. We also found possible gene flow from Denisovan to Philippine Negrito populations.

The Japanese Archipelago (Japonesia) ranges geographically from Hokkaido to the Okinawa islands, stretching over 4,000 km and was populated more than 40,000 years ago by the Paleolithic people. The Jomon culture, defined by the presence of cord marked (“jomon” in Japanese) pottery, lasted from 16,000 to 3,000 years ago, followed by the Yayoi culture in which rice farming started. At present, Japonesians can be roughly divided into three populations; Ainus, Mainlanders, and Ryukyans. We found small but clear common genetic features between the Ainus and Ryukyans though genome-wide SNP data analyses (Japanese Archipelago Human Population Genetics Consortium, 2012; *J. Hum. Genet.* 57:787-795). This genetic proximity possibly originated from higher Jomon DNA inheritance to these populations compared to Japonesian Mainlanders. Kanzawa-Kiriyama et al. (unpublished) recently determined partial nuclear genomes of several Jomon individuals excavated from four geographical regions with a time range of 3000-8000 BP. Those nuclear genome sequences showed that the Jomon people diverged from common ancestors of both northern and southern East Eurasians, but this divergence postdated that of East Eurasian and Melanesians. We also found possible gene flow not only between Jomon and Neanderthal but also between the Jomon and Denisovan. The existence of Denisovan DNA both in Philippine Negritos and Jomon people posed interesting but complicated problems to the origin of East Eurasians.

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