AARHUS UNIVERSITY
NATURAL SCIENCES

Master's Thesis

Specifying the meetings between anatomically modern humans, Neanderthals, and Denisovans

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Abstract

About 60,000 years ago, our ancestors, the anatomically modern humans, migrated out of Africa and into Eurasia. Here they met other hominin groups, such as Neanderthals and Denisovans, that they interbred with. These meetings left a genetic mark in the form of introgressed archaic DNA into the genomes of people today. All present-day non-African populations have around 2% introgressed Neanderthal DNA scattered in smaller fragments in their genomes. The proportion of Denisova ancestry is a bit more complex, as the distribution of Denisova genetic signals is highly variable. The highest proportion of Denisovan ancestry is found in Oceanian populations (3-6%), while mainland Eurasian and Native American populations have under 1% of Denisovan content. Although much is already known about anatomically modern humans and their meetings with Neanderthals and Denisovans, many things remain unclear. Usually, archaic content is compared to sequenced archaic genomes. However, in this study, archaic content will be compared among present-day human populations by creating artificial archaic genomes for each population to compare the introgressing population's genomes more specifically. This will be done by comparing the nucleotide divergence patterns in the archaic content between populations. The Neanderthal divergence measurements supported a single introgression event from one Neanderthal population that happened before the split of non-African populations. On the contrary, the Denisova divergence measurements suggested multiple introgressions from at least two divergent Denisova population sources.

Future work could involve other strategies for sampling archaic content, such as downsampling to have the same number of individuals in all samples, sampling the longest non-overlapping fragments to get more information, or sampling all non-overlapping intervals between fragments to get as much information as possible.

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