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## A Time Series of Prehistoric Mitochondrial DNA Reveals Western European Genetic Diversity Was Largely Established by the Bronze Age

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### ABSTRACT

A major unanswered question concerns the roles of continuity versus change in prehistoric Europe. For the first time, genetic samples of reasonable size taken at multiple time points are revealing piecemeal snapshots of European prehistory at different dates and places across the continent. Here, we pull these disparate datasets together to illustrate how human genetic variation has changed spatially and temporally in Europe from the Mesolithic through to the present day. Mitochondrial DNA (mtDNA) haplogroups were determined for 532 European individuals from four major eras: the Mesolithic, Neolithic, Chalcolithic (late Neolithic/early Bronze Age transition) and Modern periods. The Mesolithic was characterized by low mtDNA diversity. These initial European settler haplogroups declined rapidly in the Neolithic, as farmers from the east introduced a new suite of mtDNA lineages into Western Europe. For the first time, we show that the Chalcolithic was also a time of substantial genetic change in Europe. However, rather than the arrival of new mtDNA lineages, this period was characterized by major fluctuations in the frequencies of existing haplogroups. Besides the expansion of haplogroup H, there were few major changes in mtDNA diversity from the Chalcolithic to modern times, thus suggesting that the basic profile of modern western European mtDNA diversity was largely established by the Bronze Age.

### KEYWORDS

Europe; Prehistory; MtDNA; Haplogroup Diversity; Temporal Dynamics

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