

## **ORIGINS AND EVOLUTION OF THE ETRUSCANS' DNA**

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### *Ancient DNA, mitochondrial DNA, Approximate Bayesian Computation*

The Etruscan culture is documented in Etruria, Central Italy from the 7th to the 1st century BC. For more than 2,000 years there has been disagreement on the Etruscans' biological origins, whether local or in Anatolia. Genetic affinities with both Tuscan and Anatolian populations have been reported, but so far all attempts to fit the Etruscans' and modern mitochondrial DNAs in the same genealogy have failed. In this study we expanded the ancient sample, typing 14 individuals from the Tarquinia and Casanievole necropoleis, according to all the standard criteria to ensure reproducibility of the ancient DNA sequences. We analysed these sequences along with previously typed Etruscan and Tuscan Medieval sequences from our lab, and with a wide database of modern European populations.

We compared ancient and modern mtDNA diversity with the results of millions of computer simulations by methods of Approximate Bayesian Computation. In this way, we identified the demographic model showing the closest agreement with the observed data, and we estimated its relevant parameters. We found significant evidence of genealogical continuity between the Etruscans and two communities from Tuscany, Volterra and Casentino, whereas the results about a third Tuscan isolate, Murlo, were more ambiguous. People of coastal Anatolia, the area where ancient historians placed the Etruscans' putative roots, appear descended from ancestors who had some degree of genetic similarity with the Etruscans. However, estimates based on a model of isolation with migration suggest that these similarities date back to <10,000 years ago, and hence originated long before the appearance of the Etruscan culture in the archaeological record. If confirmed, this result would strongly suggest that the Etruscan culture developed locally without significant contribution of recent Anatolian immigrants.