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NEWS EVOLUTION

Iceland's founding fathers underwent a rapid, 1000-year genetic shift

Today's islanders are pretty different from their ancestors, genomic analysis reveals

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Scientists analyzed the ancient genes of skeletons belonging to some of Iceland's first settlers, like this one discovered in a grave near the island's northern coast. IVAR BRYNJOLFSSON/THE NATIONAL MUSEUM OF ICELAND

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If modern Icelanders came face-to-face with their founding fathers, they'd be hard-pressed to see much family resemblance, according to a new study. That's because today's Icelanders have a much higher proportion of Scandinavian genes than their distant ancestors did, suggesting the islanders underwent a remarkably rapid genetic shift over the past thousand years.

Previous studies have [hinted as much](#) based on inferences from modern genotypes, notes Jonathan Pritchard, a population geneticist at Stanford University in Palo Alto, California, who wasn't involved in the work. But the new findings offer a rare, direct glimpse of the founding of a new people. "I don't think this has been shown before in any human population."

Medieval histories suggest Iceland was first settled between 870 C.E. and 930 C.E. by seafaring Vikings and the people they enslaved, who possessed a *mélange* of genes from what is now Norway and the British Isles. For the next thousand years, the population of Iceland remained relatively small and isolated, hovering between about 10,000 and 50,000. Impeccable genealogical records and broad genetic sampling have made Icelanders—who now number 330,000—a model population for geneticists hoping to connect the dots between gene variants and traits.



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Looking to build on the previous research, a team led by geneticist S. Sunna Ebenesersdóttir, of the University of Iceland and the biopharmaceutical company deCODE Genetics, both in Reykjavik, analyzed the whole genomes of 27 ancient Icelanders whose skeletal remains were found in burial sites across the island. It was clear from archaeological and radiocarbon dating, which put the remains at about 1000 years old, that they belonged to the early generations of settlers.

Sequencing revealed that the settlers had a roughly even split of Norse (from what are today Norway and Sweden) and Gaelic (from what are now Ireland and Scotland) ancestry. But when the researchers compared the ancient genomes to those of thousands of modern people in Iceland and other European countries, they found that contemporary Icelanders, on average, [draw about 70% of their genes from Norse ancestry](#). That suggests in the approximately 1100 years between Iceland's settlement and today, the population has undergone a surprisingly quick genetic shift, the researchers report today in *Science*.

When the researchers used a computer simulation to model the spread of genes in the population over time, they found a rather prosaic explanation for the rapid change: random fluctuations in gene frequencies known as genetic drift, often seen in isolated populations of animals but rarely tracked in such detail in humans. Comparatively recent migration by Scandinavians—particularly those from Denmark—likely has also shifted Iceland's gene pool, the authors note. Another possibility, add the authors, is that ancient Icelanders with more Norse ancestry held a slight edge in reproductive success over those with Gaelic ancestry, many of whom were enslaved when they came to the island.

The authors caution that their sample size for the founding population is small enough that it might underrepresent enslaved people, who were less likely to be buried in well-marked graves. A broader sample of ancient Icelanders is needed to determine which factors most strongly influenced the island's genetics, they say.

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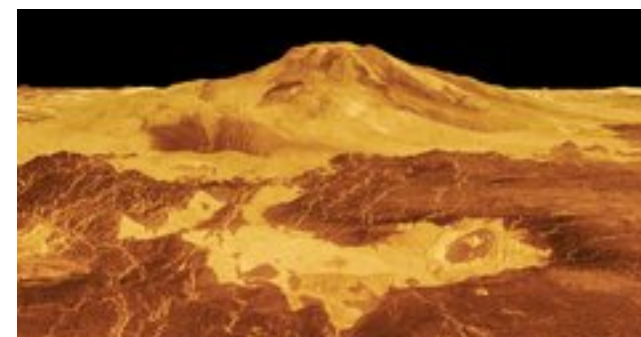
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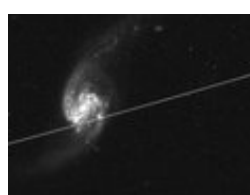
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