

‘Ghost lineages’: Discovering extinct species in modern animal DNA

Either before, during, or shortly after their migration to the [Tibetan] plateau, *H. sapiens* got friendly with [Denisovans](#), while their domesticated dogs interbred with [Tibetan wolves](#). And from those hybridizations, both picked up adaptive variants of the EPAS1 gene.

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[Geneticist Rasmus] Nielsen and his colleagues [discovered](#) that before wolves passed EPAS1 along to dogs, the wild canids obtained the helpful EPAS1 variant by breeding with another canine species—one that, to this day, remains unknown.

Researchers refer to these extinct species, whose genes linger in the genomes of living animals, as “ghost” lineages, and we now know they’re everywhere in the tree of life—they simply remained obscured until recently, when advances in sequencing technology and genomic analyses began to reveal them.

For example, while scientists have known for more than a decade that modern humans carry sequences from ancient hybridizations with [Neanderthals](#) and [Denisovans](#), more recent analyses suggest there are [other ancestors](#) haunting our genomes. Discovering when and where species of humans interbred with and interacted with each other will tell the hidden stories of our past and help us understand why *H. sapiens* is the only hominin species left alive today.

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