

GENES

SRY
RPS4Y
ZFY
PCDH11Y
AMELY
AZFa

SMCY

AZF

STRs

LOCATION	NUMBER
DYS393	13
DYS19	16
DYS391	10
DYS439	11
DYS389-1	13
DYS389-2	17
DYS388	12
DYS390	25
DYS426	12
DYS385a	12
DYS385b	14
DYS392	11



YOUR RESULTS

PARTICIPANT ID: FW33E4H3KG

Type Y-Chromosome

Haplogroup
R1a (M17)



How to Interpret Your Results

At left are results from the laboratory analysis of your Y-chromosome. Your DNA was analyzed for Short Tandem Repeats (STRs), which are repeating segments of your genome that have a high mutation rate. The location on the Y chromosome of each of these markers is depicted in the image, with the number of repeats for each of your STRs presented to the right of the marker. For example, DYS19 is a repeat of TAGA, so if your DNA repeated that

—THE—
GENOGRAPHIC
PROJECT

Certificate of Y-chromosome DNA testing

In recognition of your participation in the Genographic Project, we hereby certify that

Truher Men

belongs to:

Haplogroup R1a (M17)

The designations for all twelve loci examined for this purpose are listed here,
along with the Short Tandem Repeats (STRs) outcome for each.

393	19	391	439	389-1	389-2	388	390	426	385a	385b	392
13	16	10	11	13	17	12	25	12	12	14	11

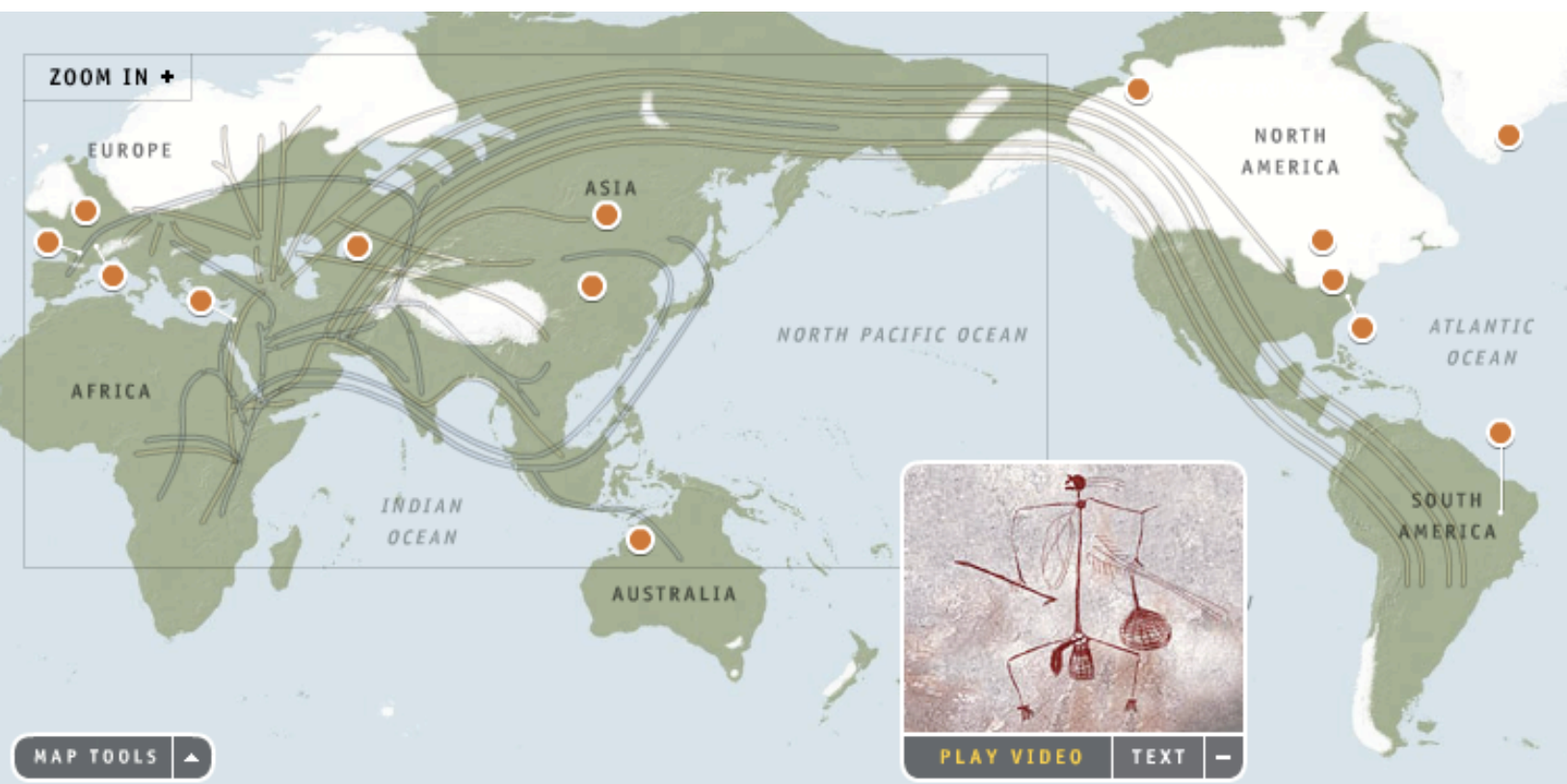
October 17, 2005

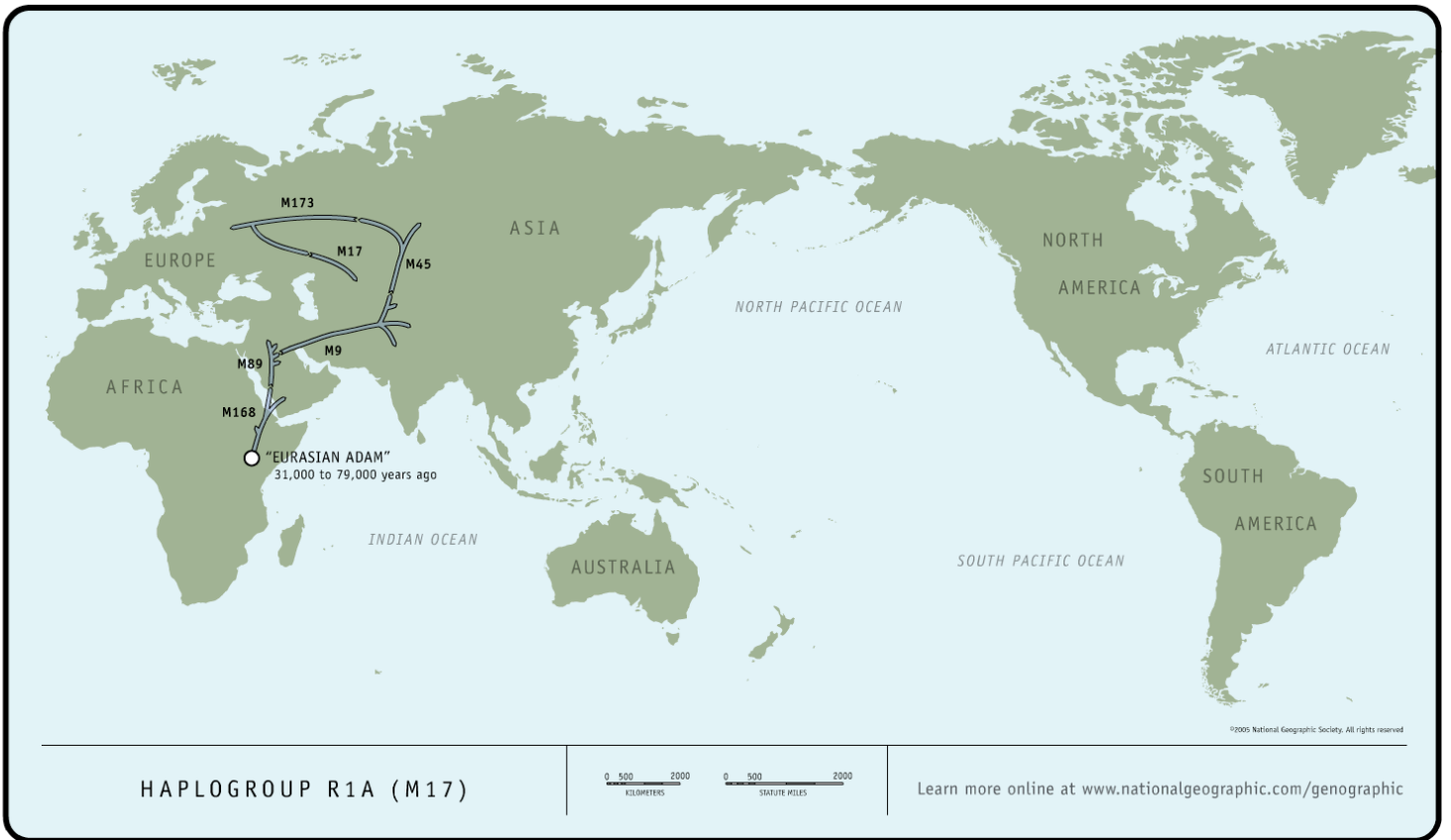


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HAPLOGROUP R1A (M17)

Your Y chromosome results identify you as a member of haplogroup *R1a*, a lineage defined by a genetic marker called *M17*. This haplogroup is the final destination of a genetic journey that began some 60,000 years ago with an ancient Y chromosome marker called *M168*.

The very widely dispersed *M168* marker can be traced to a single individual—"Eurasian Adam." This African man, who lived some 31,000 to 79,000 years ago, is the common ancestor of every non-African person living today. His descendants migrated out of Africa and became the only lineage to survive away from humanity's home continent.

Population growth during the Upper Paleolithic era may have spurred the *M168* lineage to seek new hunting grounds for the plains animals crucial to their survival. A period of moist and favorable climate had expanded the ranges of such animals at this time, so these nomadic peoples may have simply followed their food source.

Improved tools and rudimentary art appeared during this same epoch, suggesting significant mental and behavioral changes. These shifts may have been spurred by a genetic mutation that gave "Eurasian Adam's" descendants a cognitive advantage over other contemporary, but now extinct, human lineages.

Some 90 to 95 percent of all non-Africans are descendants of the second great human migration out of Africa, which is defined by the marker *M89*.

M89 first appeared 45,000 years ago in Northern Africa or the Middle East. It arose on the original lineage (*M168*) of "Eurasian Adam," and defines a large inland migration of hunters who followed expanding grasslands and plentiful game to the Middle East.

Many people of this lineage remained in the Middle East, but others continued their movement and followed the grasslands through Iran to the vast steppes of Central Asia. Herds of buffalo, antelope, woolly mammoths, and other game probably enticed them to explore new grasslands.

With much of Earth's water frozen in massive ice sheets, the era's vast steppes stretched from eastern France to Korea. The grassland hunters of the *M89* lineage traveled both east and west along this steppe "superhighway" and eventually peopled much of the continent.

A group of *M89* descendants moved north from the Middle East to Anatolia and the Balkans, trading familiar grasslands for forests and high country. Though their numbers were likely small, genetic traces of their journey are still found today.

Some 40,000 years ago a man in Iran or southern Central Asia was born with a unique genetic marker known as *M9*, which marked a new lineage diverging from the *M89* group. His descendants spent the next 30,000 years populating much of the planet.

Most residents of the Northern Hemisphere trace their roots to this unique individual, and carry his defining marker. Nearly all North Americans and East Asians have the *M9* marker, as do most Europeans and many Indians. The haplogroup defined by *M9*,



K, is known as the Eurasian Clan.

This large lineage dispersed gradually. Seasoned hunters followed the herds ever eastward, along a vast belt of Eurasian steppe, until the massive mountain ranges of south central Asia blocked their path.

The Hindu Kush, Tian Shan, and Himalaya, even more formidable during the era's ice age, divided eastward migrations. These migrations through the "Pamir Knot" region would subsequently become defined by additional genetic markers.

The marker *M45* first appeared about 35,000 to 40,000 years ago in a man who became the common ancestor of most Europeans and nearly all Native Americans. This unique individual was part of the *M9* lineage, which was moving to the north of the mountainous Hindu Kush and onto the game-rich steppes of Kazakhstan, Uzbekistan, and southern Siberia.

The *M45* lineage survived on these northern steppes even in the frigid Ice Age climate. While big game was plentiful, these resourceful hunters had to adapt their behavior to an increasingly hostile environment. They erected animal skin shelters and sewed weathertight clothing. They also refined the flint heads on their weapons to compensate for the scarcity of obsidian and other materials.

The intelligence that allowed this lineage to adapt and thrive in harsh conditions was critical to human survival in a region where no other hominids are known to have survived.

Members of haplogroup *R* are descendents of Europe's first large-scale human settlers. The lineage is defined by Y chromosome marker *M173*, which shows a westward journey of *M45*-carrying Central Asian steppe hunters.

The descendents of *M173* arrived in Europe around 35,000 years ago and immediately began to make their own dramatic mark on the continent. Famous cave paintings, like those of Lascaux and Chauvet, signal the sudden arrival of humans with artistic skill. There are no artistic precedents or precursors to their appearance.

Soon after this lineage's arrival in Europe, the era of the Neandertals came to a close. Genetic evidence proves that these hominids were not human ancestors but an evolutionary dead end. Smarter, more resourceful human descendents of *M173* likely outcompeted Neandertals for scarce Ice Age resources and thus heralded their demise.

The long journey of this lineage was further shaped by the preponderance of ice at this time. Humans were forced to southern refuges in Spain, Italy, and the Balkans. Years later, as the ice retreated, they moved north out of these isolated refuges and left an enduring, concentrated trail of the *M173* marker in their wake.

Today, for example, the marker's frequency remains very high in northern France and the British Isles—where it was carried by *M173* descendents who had weathered the Ice Age in Spain.

Haplogroup *R1a* originated about 10,000 years ago, most likely on the grassy steppes of the Ukraine or southern Russia. Its defining genetic marker, *M17*, first appeared in a man of the *M173* lineage. His descendents spread from Europe to the Middle East, India, and even Iceland. Early *M17* peoples were nomadic steppe farmers and possibly the first to domesticate the horse, which might have eased their numerous migrations. From the Czech Republic to Siberia, and south through Central Asia, some 40 percent of all men are members of this haplogroup.



This interesting line of descent may be responsible for the birth of Indo-European languages. The world's most widely spoken language family includes English, the Romance Languages, Farsi, and various Indian tongues. But many Indo-European languages share similar words for animals, plants, tools, and weapons—suggesting a common ancestor that linguists call proto-Indo-European.

Some linguists believe that the nomadic Kurgan people were the first to speak proto-Indo-European languages, some 5,000 to 10,000 years ago. Geneticists subsequently theorize that these people may have been descendants of *M17*. The Indo-European time line and linguistic distribution interestingly mirror this lineage's genetic and physical journey.

Further language parallels are seen in India where speakers of Indo-European languages, such as Hindi, are predominately *M17*. Speakers of India's unrelated Dravidian languages show much lower frequencies of this marker—even when they live in close proximity to one another. These data suggest a striking relation between the spread of language and the arrival of a unique genetic lineage brought to India by migrants from the steppes.

