

DNA EN MtDNA

DNA AND MtDNA

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Wat word bedoel met DNA?

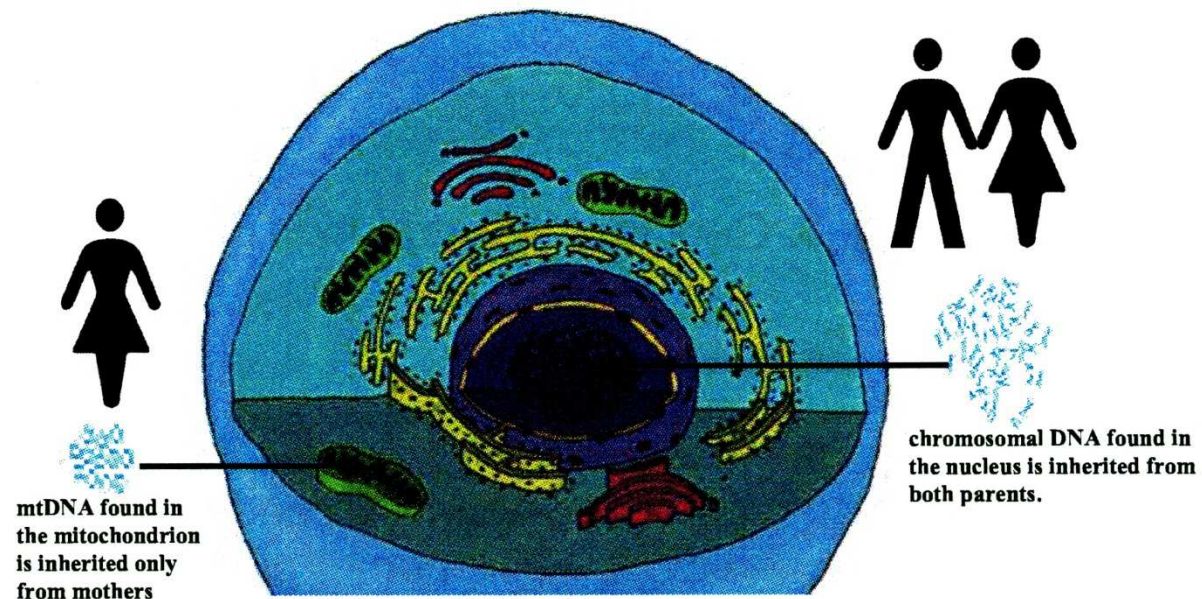
- DNA en MtDNA is die boustene van 'n mens se genetiese samestelling.
- Deur die toetsing hiervan kan verskeie goed bepaal word:
- Ouerskap
- Familieverwantskap in die breë
- DNA Profiele
- Forensie ondersoeke in hofsake

DNA vs MtDNA

- DNA is die chromosomnale DNA wat gevind word in die nukleus van 'n mense sel.
- MtDNA is die mitochondriese DNA wat gevind word in die sitoplasma van die sel.

DNA en MtDNA

Both chromosomal DNA found in the nucleus of the cell (contributed from both parents) and mitochondrial DNA (mtDNA) found in the cytoplasm of the cell (inherited only from the mother), make up the total genomic DNA found in every cell (Figure 1).



Wat word bedoel met DNA toetsing?

- DNA toetsing in genealogiese verband is slegs van toepassing op mans, aangesien die Y geen slegs by hulle voorkom.
- Die geen word van vader na seun oorgedra.
- Die familielyn wat dus hierdeur bepaal kan word is dus die seun se pa se pa ensovoorts.

- Dit is dus slegs die een buitenste lyn van 'n man se voorgeslag wat hierdeur bepaal kan word.
- Die lyn sal nie aandui wie jou voorouers is nie, maar wel uit watter groep en moontlik watter families na verwant is aan die betrokke persoon.

The journeys that shaped history

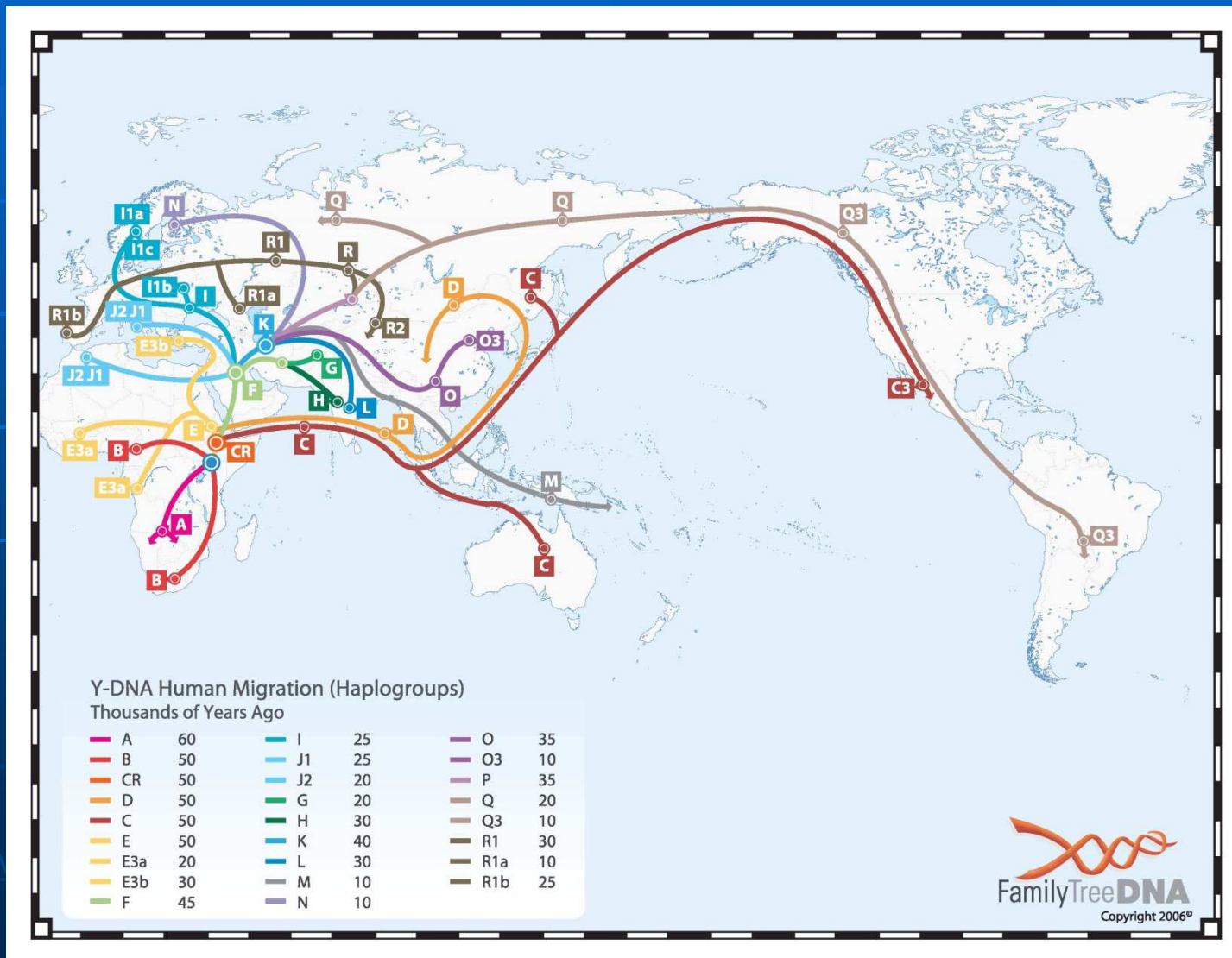
- This male family tree is rooted some 100,000 years ago, at a time when the ancestors of all modern humans were living in Africa. As some of these early groups of humans took their first tentative steps out of our ancient homeland, their journeys led them in different directions and their family lines gradually began to diverge. It is these different lineages that form the separate branches of the global family tree.

- DNA Solutions has divided the male family tree into 17 unique accounts tracing the most important of these journeys - the ones that would define the course of subsequent human history. The account we send you will reveal the route your own paternal ancestors took as they left Africa, explaining how and when your ancestors arrived at the part of the world in which their genetic inheritance is most visible today. You might, for example, learn that you inherited your Y chromosome from one of a number of groups of hunter-gatherers who arrived in Europe around the time of the Great Ice Age.

Or you might discover that you are descended from a group of Neolithic farmers who journeyed into Europe from the Near East after the Ice Age had ended, bringing with them agricultural knowledge that would change our way of life forever. Or perhaps you are descended from another ancestral lineage.

- Every man alive today has a Y chromosome that links him directly to one of these epic journeys, but nobody cannot be certain which simply by looking at that man's physical characteristics or country of birth. Only the latest genetic technology can reveal which of these journeys began your own family's history.

Y-DNA migration map Male Haplogroup

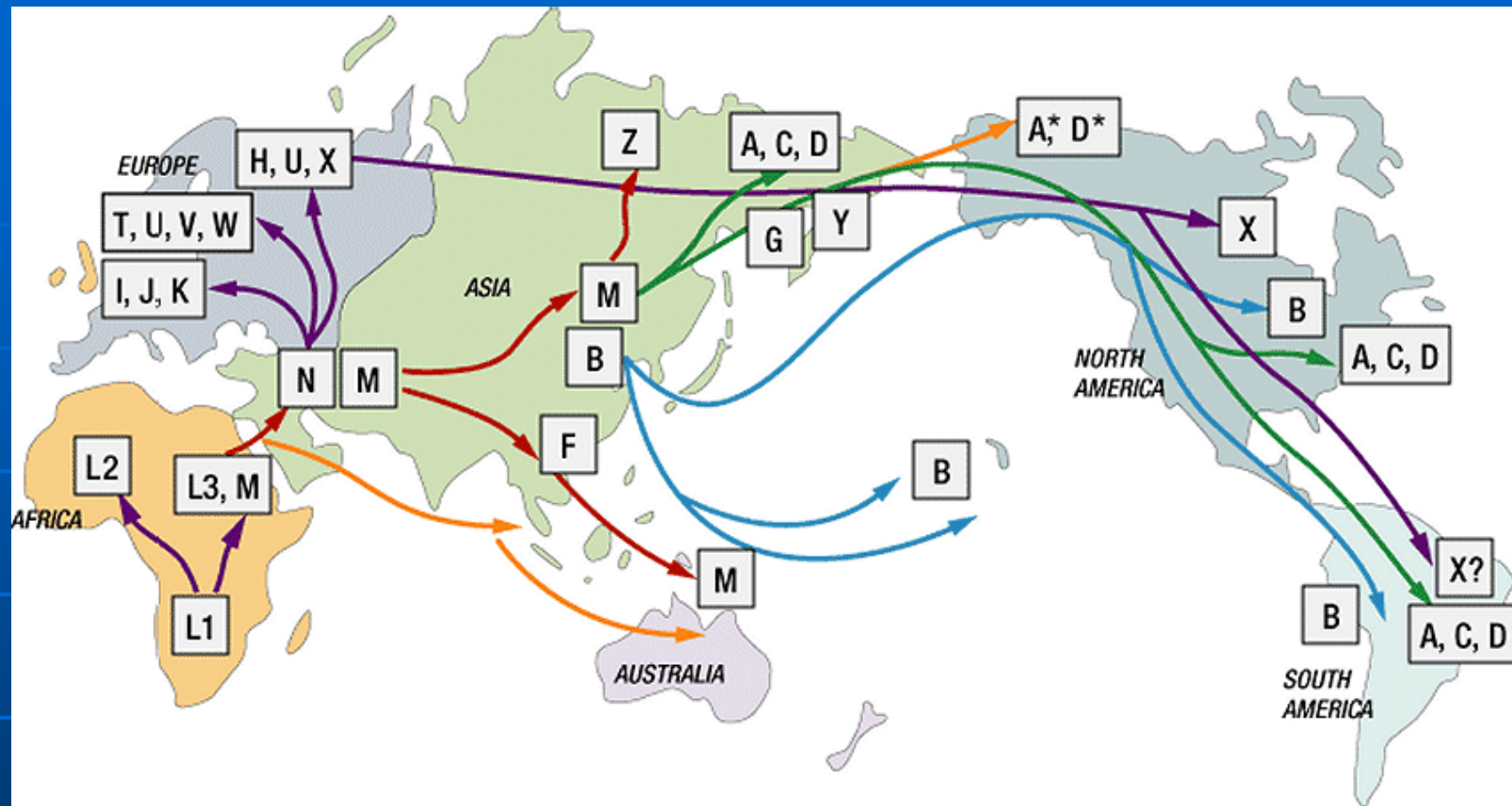


Wat word bedoel met MtDNA?

- MtDNA toetsing is van toepassing op beide mans en vrouens.
- Die toetsing word gedoen op die X geen.
- Die geen word van moeder na kind oorgedra.
- Die genetiese lyn wat dus getoets kan word is die ekstreme moederlyn van 'n persoon.

- Weereens gaan die uitslag nie kan bepaal wie jou voorgeslag is nie, maar wel waar die herkoms is en moontlik watter families aanverwant is.

MtDNA Migration map Female Haplogroups

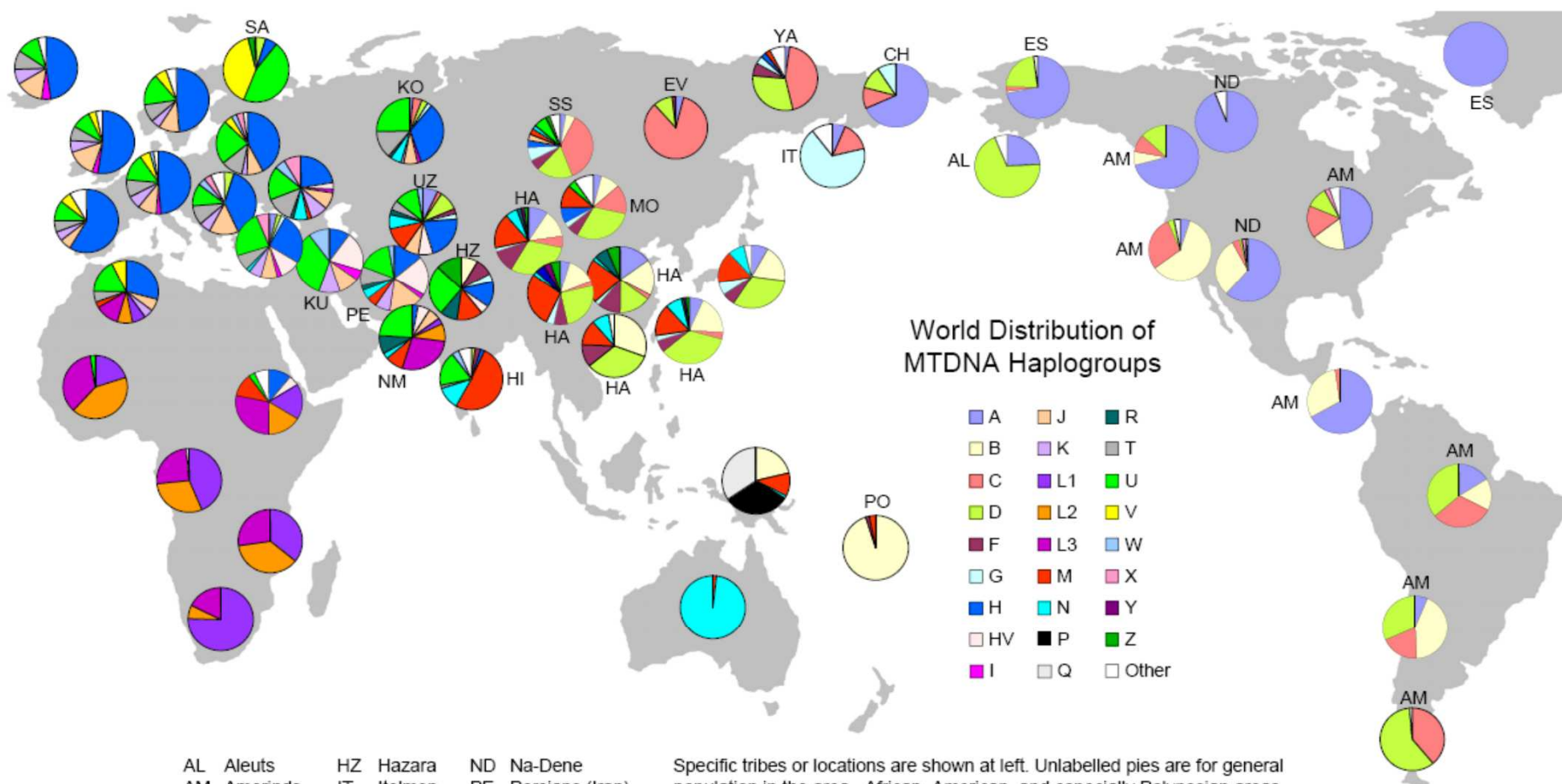


EXPANSION TIMES (years ago)

Africa	120,000 - 150,000
Out of Africa	55,000 - 75,000
Asia	40,000 - 70,000
Australia/PNG	40,000 - 60,000
Europe	35,000 - 50,000
Americas	15,000 - 35,000
Na-Dene/Esik/Aleuts	8,000 - 10,000

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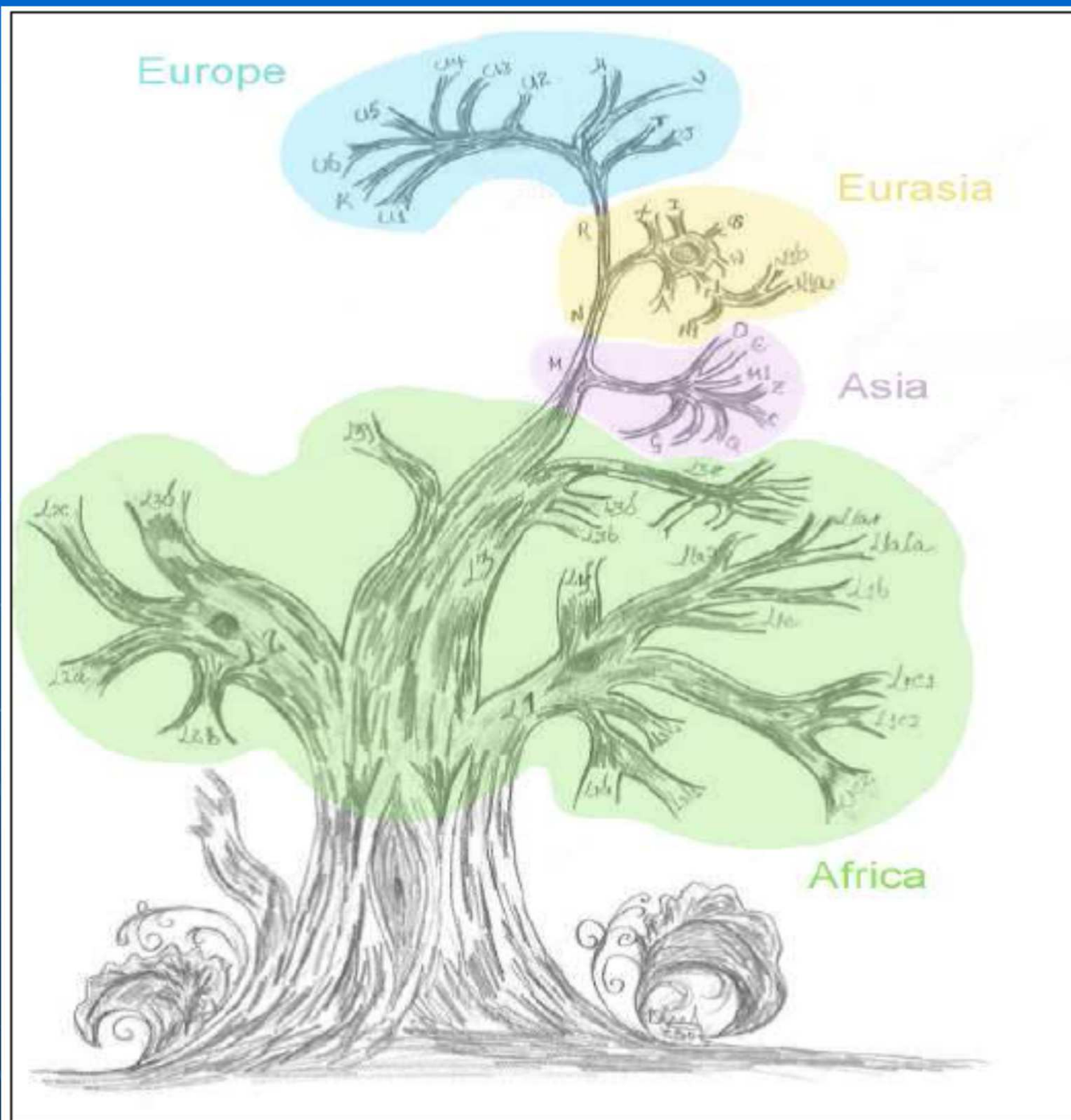

FamilyTreeDNA
mtDNA Migrations Map

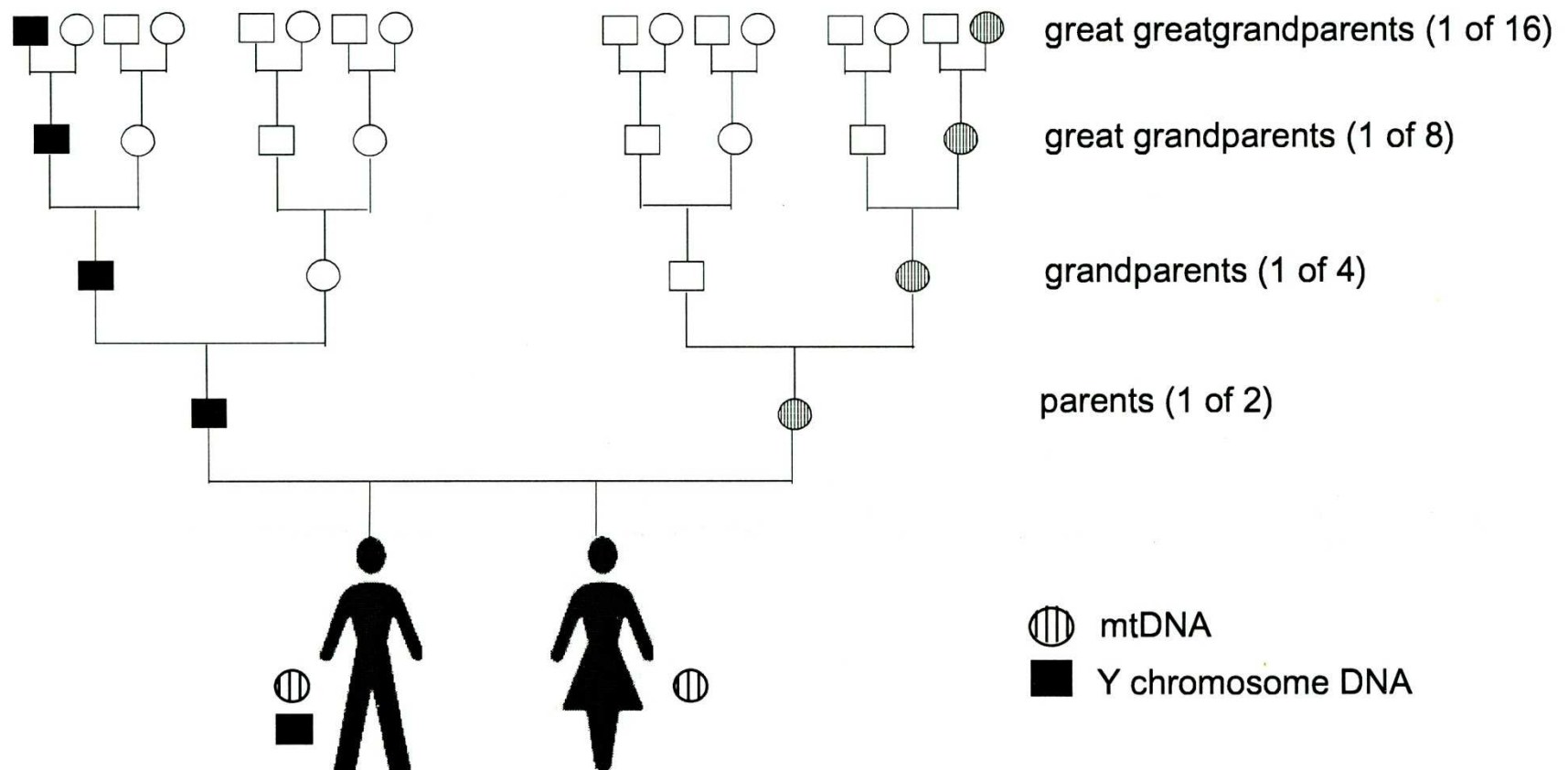


AL Aleuts	HZ Hazara	ND Na-Dene
AM Amerinds	IT Itelmen	PE Persians (Iran)
CH Chukchi	KO Komi	PO Polynesians
ES Eskimo	KU Kurds	SA Saami
EV Evenks	NM Negroid	SS South Siberians
HA Han Chinese	UZ Uzbeks	YA Yakuts
HI Hindus	MO Mongols	

Specific tribes or locations are shown at left. Unlabelled pies are for general population in the area. African, American, and especially Polynesian areas are very large. The data in this chart is supposed to represent the situation before the recent European expansion beginning about 1500 AD.

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Limitations of genetic ancestry testing

- For example, Y chromosome tracing will connect a man to his father but not his mother, and it will connect him to only one of his four grandparents: his paternal grandfather. In the same way it will connect him to one of his eight great grandparents -

Limitations of genetic ancestry testing

- Continue back in this manner for 14 generations and the man will still be connected to only one ancestor in that generation. Y chromosome DNA testing will not connect him to any of the other 16 383 ancestors in that generation to whom he is also related in equal measure. The same scenario applies when using mtDNA.

DNA verwantskap bepaling

- DNA toetse kan die volgende bepaal:
- Wie jou direkte ouers is.
- Wie jou broers en susters is.
- Wie jou oupa en ouma is.
- Wie jou ooms en tantes is.
- Al bogenoemde verwantskappe kan posetief bepaal word deur DNA analise.

Merkers en wat word hiermee bedoel?

- In die ontleding van die DNA en MtDNA word gepraat van MERKERS.
- Merkers is gegewe posisies op die DNA wat ontleed word en bepalend is oor waar 'n afwyking voorkom.
- Daar word gewoonlik van 'n gegewe aantal merkers gebruik gemaak by die analise, bv 11, 12, 16, 25, 37 en in ekstreme gevalle van 67.

Ancestry Research FAQ

- **Can this be used to identify my ethnicity?**
- **Can you tell me my ancestors' names and dates of birth?**
- **Are there any restrictions on testing?**

Tracing Human History Through Genetic Mutations

By examining DNA patterns that are inherited maternally or paternally, scientists can trace human lineages back to the original branches, or sons and daughters, of a genetic Adam and an Eve.

Europe

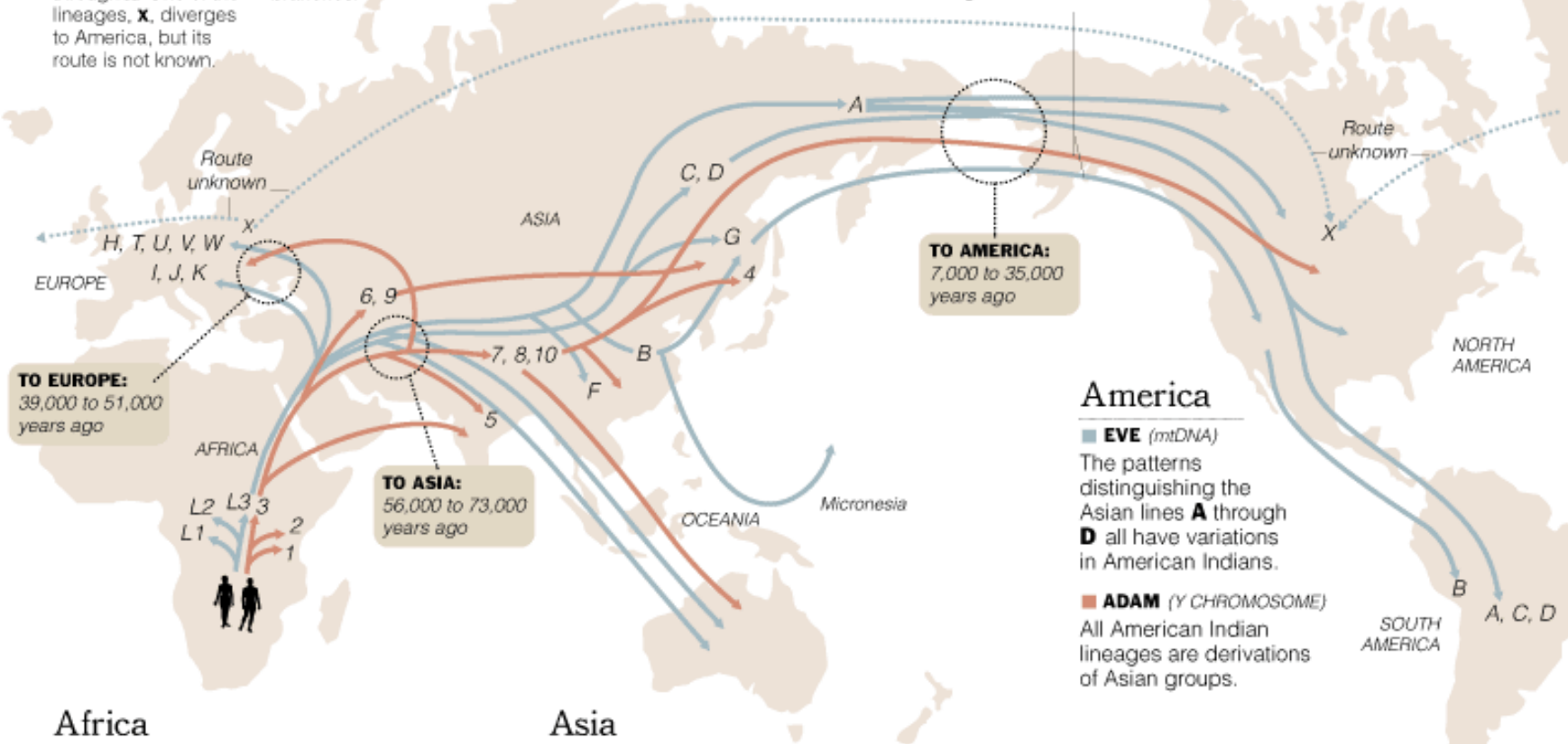
■ **EVE** (mDNA)

The nine European lineages are named **H** through **K**, and **T** through **X**. One of the lineages, **X**, diverges to America, but its route is not known.

■ **ADAM** (Y CHROMOSOME)

All European lineages are variations of African and Asian branches.

Men and women certainly colonized the world together; the differences between the routes shown reflect differences in genetic information.



Africa

■ **EVE** (mtDNA)

The three African branches are named **L1** through **L3**, and **L3** separates into all the other branches.

■ **ADAM** (Y CHROMOSOME)

The three African branches are named **1**, **2** and **3**, and **3** separates into all the other branches.

Asia

■ **EVE** (mtDNA)

The six Asian branches are named **A** through **D** and **F** and **G**.

■ **ADAM** (Y CHROMOSOME)

The seven Asian branches are **4** through **10**, and these groups branch off into Oceania, Europe and America.

Sources: Dr. Douglas C. Wallace, Marie T. Lott, Emory University; Dr. Peter A. Underhill, Stanford University; "Genes, Peoples, and Languages," by Dr. Luca Cavalli-Sforza

Steve Duenes/The New York Times