



An Introduction

Your DNA

and Your Family Tree

(Mitochondrial DNA)

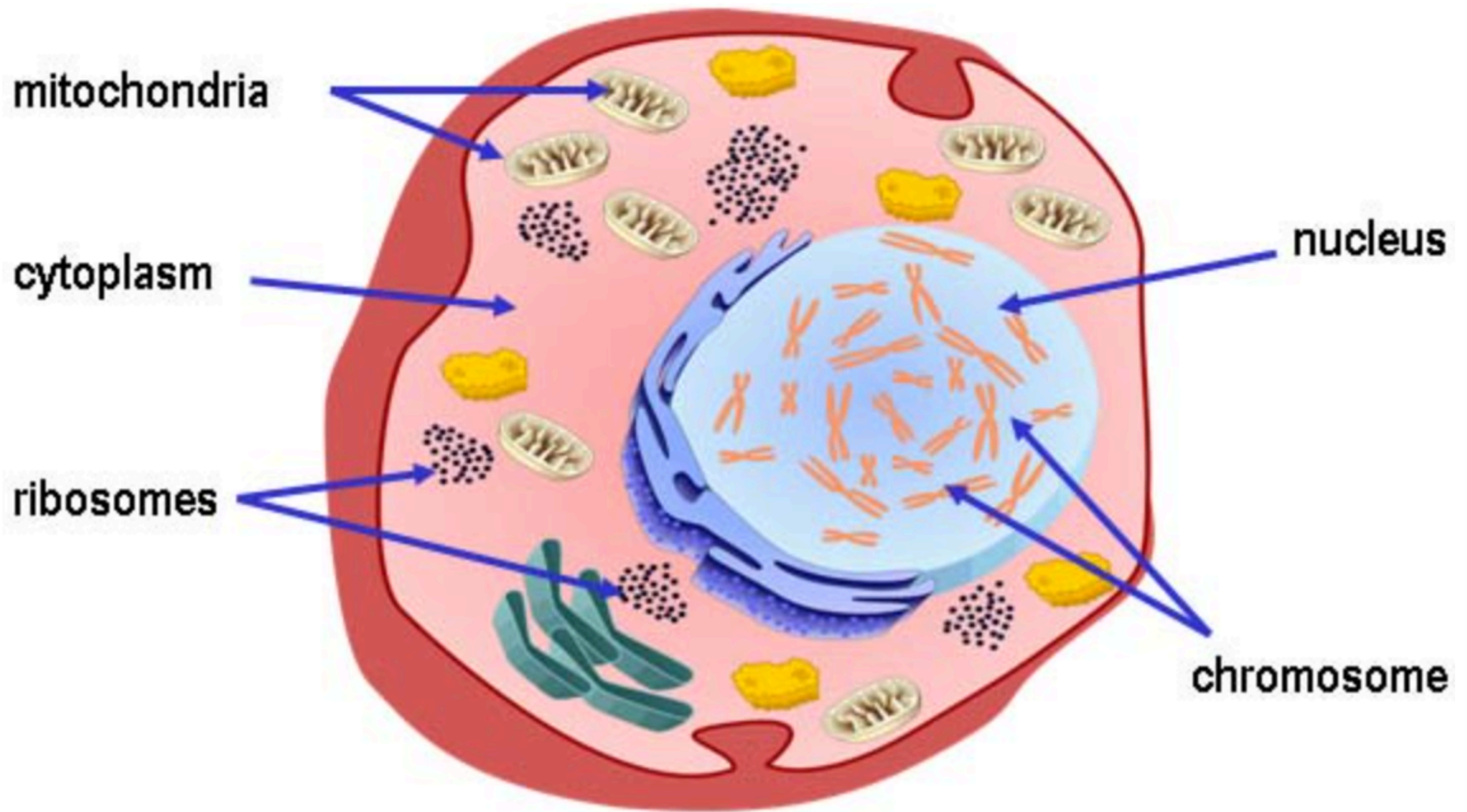
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Coffey Surname, y-DNA Project

We're now ready to move on and look at the type of results you can get from a different DNA test, for Mitochondrial DNA (mtDNA). This really has nothing to do with "Coffey y-DNA", but many of our members order this test at the same time.

Mitochondrial DNA Tests



Mitochondrial DNA Tests

Enough of this "y-DNA" stuff. Let's slice open one of your body's cells, and see what else we can find in there:

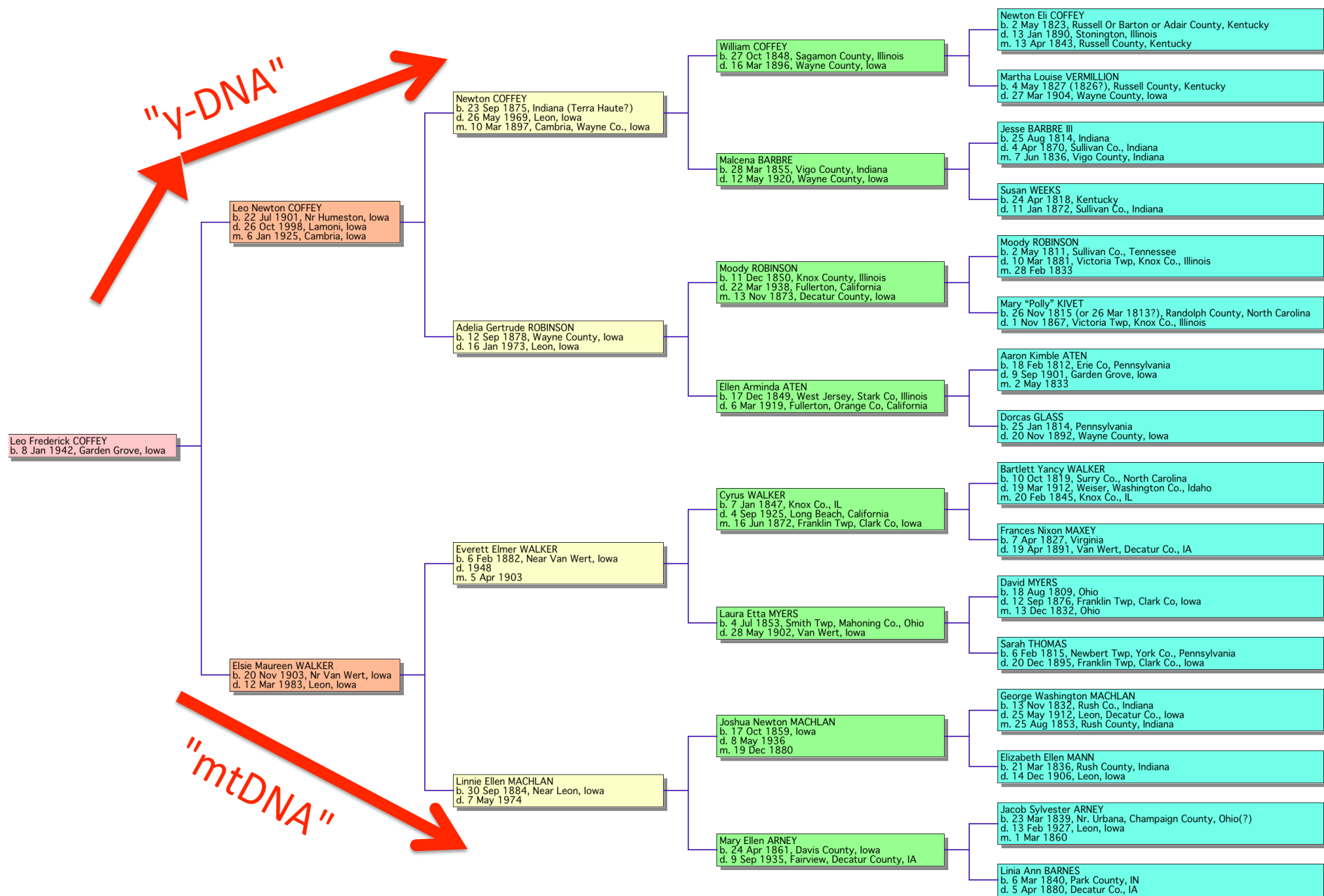
We've been talking about the chromosomes. They hang out in the nucleus of the cell.

But we will also see a number of other small bodies in there, called "mitochondria". And they have their own DNA, which is quite separate from what we find in the chromosomes.

We talked about how the y-chromosome is only handed down from father to son. And in a similar way, mitochondria are only handed down from the MOTHER. Both men and women have mitochondria, but everybody inherited them ONLY from their mother.

Scientists suspect that the mitochondria may have started out as a bacteria, living in the cytoplasm of very early creatures. But they proved very efficient at helping convert food to energy, and now they are very beneficial to us and to every multi-celled creature. We would die if our mitochondria disappeared.

Mitochondrial DNA Tests



Mitochondrial DNA Tests

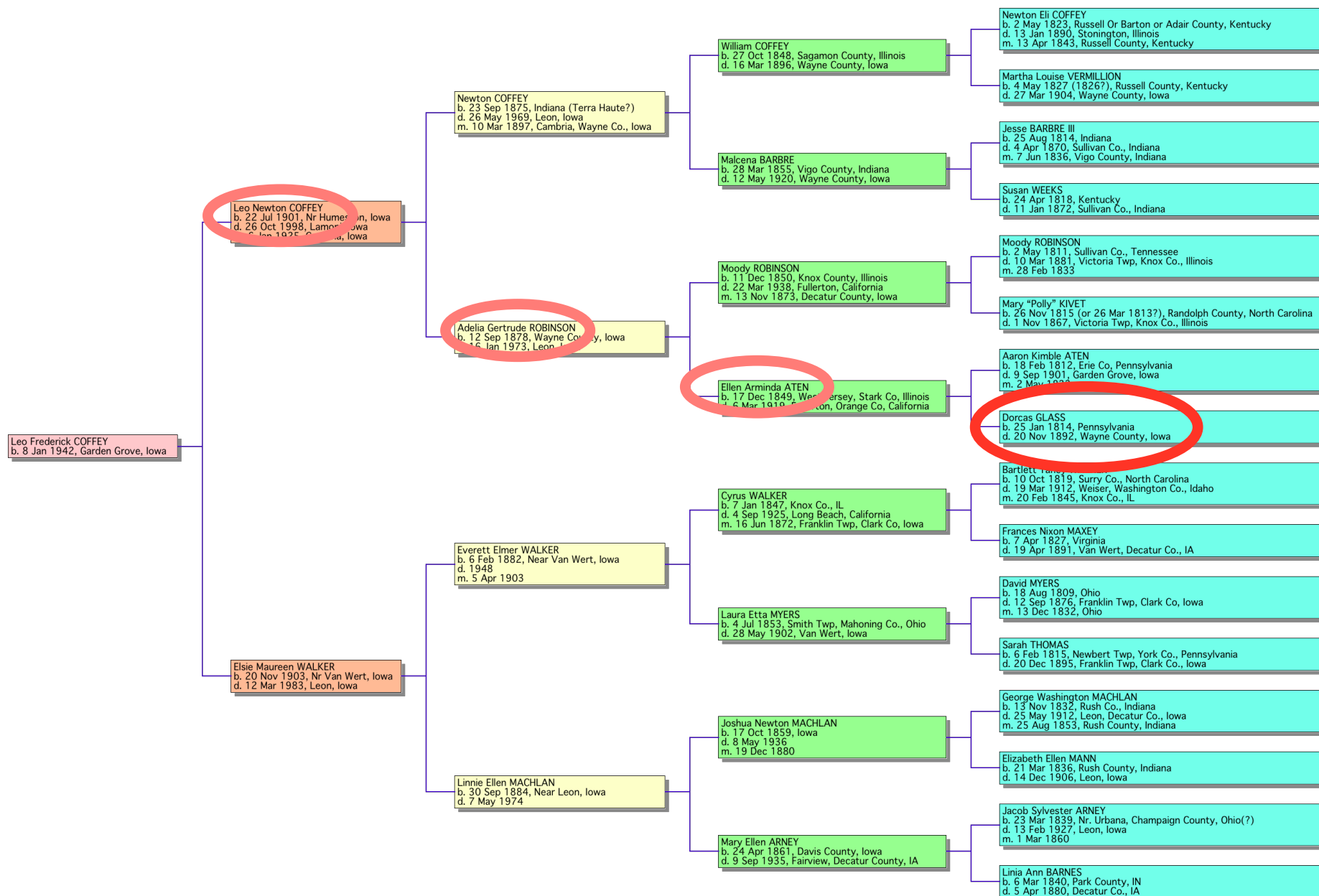
Let's go back to my example family tree. Now we have "mitochondrial DNA", or "mtDNA", that follows the female line as shown on the bottom arrow above.

It's very hard to use for genealogy, because it changes too slowly. If your mtDNA matches someone else, you KNOW you have a common ancestor - BUT you don't know if that ancestor lived 100 years ago, or 1000 years ago.

Second, the female line is not characterized by a common surname, because the birth names change with each generation. That makes it harder to track, and impossible to spot the significance of a random match. For what it's worth, my own mtDNA line is "Coffey/Walker/Machlan/Arney/Barnes/McMains/Alexander/Steele/Campbell/Beard".

Our mtDNA is tiny by DNA standards, but it still has 16,569 "base pairs". I have done that full test, and I do have eleven perfect matches in the database. But none of those have any names that match any of mine. So maybe our common ancestor is indeed 1000 years back?

An Attempt to use mtDNA for Genealogy



An Attempt to use mtDNA for Genealogy

I did try to use mtDNA once, to solve a mystery about my great-great-grandmother Dorcas Glass, shown in the big circle at the right. The problem was we knew her father's name was "Thomas Glass", but there were THREE men named "Thomas Glass" living in the right area at the right time of about the right age! And we could find no record specifically linking any of them to Dorcas. However we did know something about the genealogy of the WIVES of our three suspects. Maybe mtDNA could pick out Dorcas MOTHER?

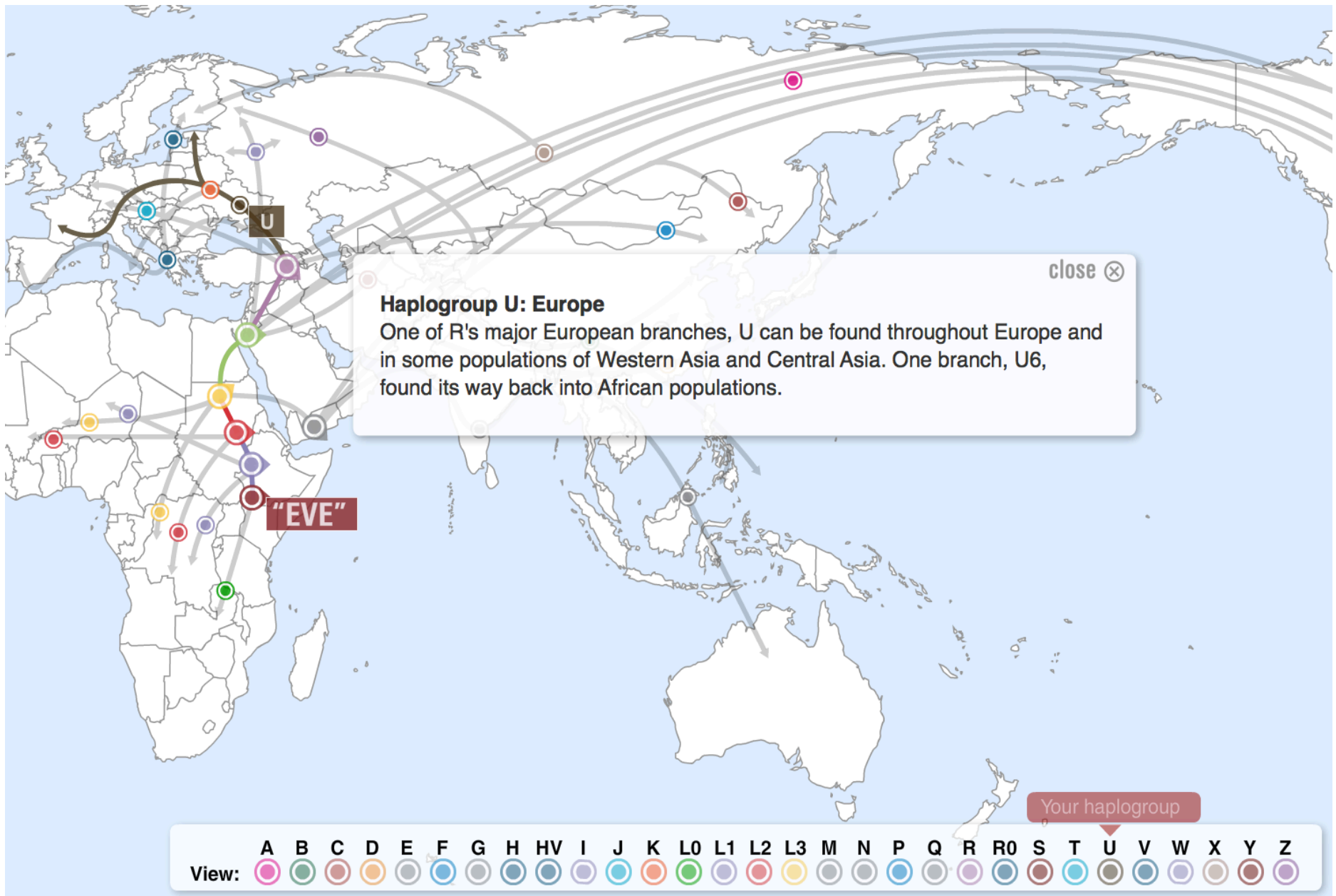
It was easy to take the first step, and follow the smaller circles back to the present and find someone to test with the same mtDNA as Dorcas. I then searched the tree of one of my "prime suspects", following a sister's line down to the present.

And I found a lady in upstate New York who would be perfect. So I worked up my nerve, and called. We had a pleasant conversation, but she gave me an emphatic "No!" when I asked for a cheek swab. I think she thought I might have some way to connect this to her credit card number?

I was about to try to talk to this lady's brother, when we had a breakthrough on the "paper trail" proving we were down the wrong DNA path anyway.

Turned out Dorcas' mother died at childbirth, and Dorcas was raised by her maternal grandparents. Her father remarried and started another family, and his new wife would have been quite unrelated to Dorcas.

mtDNA Haplogroups



mtDNA Haplogroups

Remember I showed you a migration map based on y-DNA haplogroup. We can do the same for mtDNA, because it's also handed down with only rare changes.

Again, there are many haplogroups, as shown across the bottom. And they all trace back to a "mitochondrial Eve", who lived in Africa about 120,000 years ago. She was not the only woman living at the time, but hers is the only lineage that survived into modern populations.

Seven of the modern mt-haplogroups are common in Europe, and Bryan Sykes wrote a book "The Seven Daughters of Eve", In it he discusses the origins of the seven European groups.

My group is "U", and Sykes named the first in that line "Ursula". She was the oldest of the "seven daughters". She lived about 45,000 years ago, probably in the vicinity of Greece or the Middle East.

And NO, mitochondrial chromosome Eve never met y-chromosome Adam. They were separated by 60,000 years!