

WE ARE ALL RELATED

Everyone in the world is related to everyone else. In fact, every one of the seven billion plus persons in the world is a descendant of two specific individuals who lived long ago, one of them female and one of them male.

This is easy to prove without any knowledge of DNA, genetics, science, mathematics, or any other discipline. In fact, the proof is accessible to high school students and probably most middle school students.

Furthermore, the proof does not depend on any esoteric assumptions. All you need for the proof is to realize that (1) every human being alive, or who has ever lived, has or had exactly one biological mother and one biological father, and (2) some mothers and fathers had more than one child. That's all: two facts that no one can dispute.

Let's prove that we all have a single female ancestor in common. There are an estimated 7.4 billion people in the world today; the exact number doesn't matter. Each of these 7.4 billion people had a single mother, making 7.4 billion mothers. However, there are many duplicate mothers since some mothers had more than one child. So the number of mothers of all living humans is fewer than 7.4 billion. Again, the exact number (6 billion? 5 billion?) doesn't matter. Only the fact that the number of mothers is fewer than 7.4 billion is important.

Now let's ask about the mothers of those mothers. Their number has to be still fewer than the number of mothers of all living humans. Then what about the mothers of the mothers of the mothers? That's still a smaller number. Going back in time, the number of mothers gets fewer and fewer and fewer, until it is the thousands, then the hundreds, then the dozens, and finally one single mother!

This unique mother is believed to have lived in East Africa maybe 150,000 years ago – estimates are 100,000 to 230,000 years ago, the exact date being interesting but immaterial. This mother is referred to by geneticists as "Mitochondrial Eve." She was not the first human female – after all, she had a mother, and her mother had a mother, and so forth. Nor was she the only human female alive at the time – there may have been thousands, tens of thousands, hundreds of thousands of other females alive then. Some of those other females are also ancestors of persons living today, but not necessarily the ancestor of all living mothers. What distinguishes Mitochondrial Eve is that she is everyone's ancestor in an all-female line: from Mitochondrial Eve to one of her daughters, to one of her daughters, to one of her daughters, all the way to each and every one of us.

The argument just made for mothers can be repeated for fathers. The 7.4 billion humans alive had fewer than 7.4 billion fathers, the number of fathers of the fathers is still fewer, and so forth, back to one single male referred to as "Y-chromosomal Adam." He is believed to have lived perhaps 200,000 to 300,000 years ago in central or northwest Africa, neither of which coincides with Mitochondrial Eve.

So every one of us – every Iowan, every American, every African, every European, Pope Francis, Queen Elizabeth II, Yo Yo Ma, every Syrian refugee, every Australian aborigine, every Native American, everyone – has both Mitochondrial Eve and Y-chromosomal Adam in common. Whenever you meet or read about someone, remember that they are related to you.

Go to wikipedia.com to read more about Mitochondrial Eve and Y-chromosomal Adam and why they are given those names.