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ENG 1101

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Professor Jennifer Sears

Source 1: “Scientists Think They've Found 'Mitochondrial Eve's' First Homeland.”

Specktor, Brandon. “Scientists Think They've Found 'Mitochondrial Eve's' First Homeland.” *LiveScience*, Future US Inc, 28 Oct. 2019, www.livescience.com/mitochondrial-eve-first-human-homeland.html.

This article goes back to the roots of one of the oldest DNA lineages on Earth. Specktor writes about a new discovery in the origin of Mitochondrial Eve and how it left its place of birth. He also gives the age of the gene, describes how strong it is, who can carry it, and when it began to travel.

Scientists believe that two hundred thousand years ago, the earliest common ancestors of humans stood up a green oasis in the middle of Africa's Kalahari Desert. This oasis, now extinct, is called the Makgadikgadi paleo wetland. Specktor states that our great ancestors stayed there for tens of thousands of years, but left due to climate change. Climate change made the neighboring lands become greener and habitable enough to lure the ancestors into those areas where various indigenous groups still live today. L0, an array of genes is passed down through mothers. It is encoded in the mitochondria of its inhibitors and has survived in its original form in some populations for many years (hundreds of thousands). Past similar studies have connected the earliest ancestors to regions of Eastern, Western, and Southern Africa. L0 lineage is mostly found in Khoisan people, the indigenous Southern African groups. Researchers call Makgadikgadi the homeland. Mitochondria Eve and its descendants lived 30,000 years in Makgadikgadi (from 200,000 to 170,000 years ago) before L0 split into its first subunit. Specktor writes that although researchers were entirely sure that they found the exact origin of the Eve gene, her male counterpart's origin is believed to be on the opposite of the continent. The male-inherited Y-chromosomes are found in West Africa, not the South. Y-chromosome's ancestors may have walked a path similar to Eve genes. It is possible that humans may have had multiple homelands, but as of now, it is too early to pinpoint the exact place of origin for all.

Two quotes that I thought were interesting are:

“Mitochondrial DNA accounts for just a fraction of your genome, with the bulk of your DNA locked away in cell nuclei.”

“Using climate models and sediment-core samples from the area, the team found that, from roughly 130,000 to 110,000 years ago, changing rainfall patterns opened up several ‘green corridors’ of habitable land in the desert around Makgadikgadi.”

Source 2: “Mitochondrial Eve and the Affective Politics of Human Ancestry”

> Oikkonen, Venla. “Mitochondrial Eve and the Affective Politics of Human Ancestry.” *Signs: Journal of Women in Culture and Society*, vol. 40, no. 3, 2015, pp. 747–772., doi:10.1086/679527.

This article discusses the history behind mitochondrial DNA and how it created a new discussion about race and ideals. Mitochondrial DNA or mtDNA shows how gender can coordinate Homo sapiens ancestry. During the late 80s, mtDNA was heavily debated by scientists and the public since it was being used to study the early migrations of humans. Mitochondrial genomes were first sequenced in 1981. Mitochondrial Eve gene was unveiled as man’s most recent shared maternal ancestor. People had many reactions to this new discovery. Some people were amazed and admiring of the gene. Others were enraged and frustrated due to their previous assumptions. This new declaration moved Eve from the Garden of Eden to an Africa savanna. Cultural assumptions of race, gender, and sexuality are connected to the idea of human evolution. Y-Chromosome Adam was found a few years later in the mid-90s. There is a science to mitochondrial ancestry. The research conducted is based on the knowledge that generic mutations build up throughout evolution. This means that organisms with less genetic variation diverged after those with more genetic variation. Researchers use DNA as a molecular clock that can register time progression and the gap between species or populations. Mitochondrial DNA is popular in the study of molecular evolution because of its place outside the cell nucleus in the cytoplasm. Researchers Cann, Stoneking, and Wilson analyzed 145 placentas, which are rich in DNA, from various geographic locations and two cell lines to build their project on the Eve gene. The study included the placentas of 20 Africans, 34 Asians, 46 Caucasians, 21 aboriginal Australians, and 26 aboriginal New Guineans. Africans being the most diverse people suggests that Africa is the source of the human mitochondrial gene pool. The common ancestor of mtDNA lived 140,000 to 290,000 years ago.

My reaction to this article was that it was nice to see behind Mitochondrial Eve and more about the process. I found it interesting how the researchers used the DNA in the placentas instead of from another body part. I never really thought about where the DNA would have come from but more of what it meant. Before researching, I just figured that the Eve gene was a miraculous discovery made by scientists after stumbling across some random DNA or running tests on certain people.

Two quotes that I thought were interesting are:

“Mitochondrial Eve was seen as potentially challenging gendered and racial categories.”

“While the text reports that Mitochondrial Eve and Y-chromosome Adam ‘could have lived at slightly different times’ and that they ‘were probably two random individuals in the small population of early humans,’ it nevertheless quotes Hammer’s ‘joking’ response to the possibility that Adam and Eve lived on different continents: ‘It would just mean that Adam and Eve must have run up some big phone bills.’”

Source 3: “Genetic 'Adam' and 'Eve' Uncovered”

Ghose, Tia. “Genetic 'Adam' and 'Eve' Uncovered.” *LiveScience*, Future US Inc, 1 Aug. 2013, www.livescience.com/38613-genetic-adam-and-eve-uncovered.html.

The most recent common ancestor lived only 50,000 to 60,000 years before the present day. Mitochondrial Eve and Y-chromosome Adam didn’t live near each other and have probably never met. The Y chromosome is passed from father to son, however as time progresses, the chromosome becomes over enlarged with duplicated, disarrayed stretches of DNA. Mitochondrial Eve lived in African near the time period of Y-chromosome Adam’s life. Researchers are still creating new data to further discover where Adam came from.

Two quotes that I thought were interesting are:

“Gene studies always rely on a sample of DNA and, therefore, provide an incomplete picture of human history. For instance, Hammer's group sampled a different group of men than Bustamante's lab did, leading to different estimates of how old common ancestors really are.”

“The rest of the human genome contains tiny snippets of DNA from many other ancestors — they just don't show up in mitochondrial or Y-chromosome DNA.”