

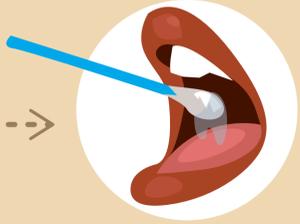
# the RESEARCH



A collaboration of **100 researchers**

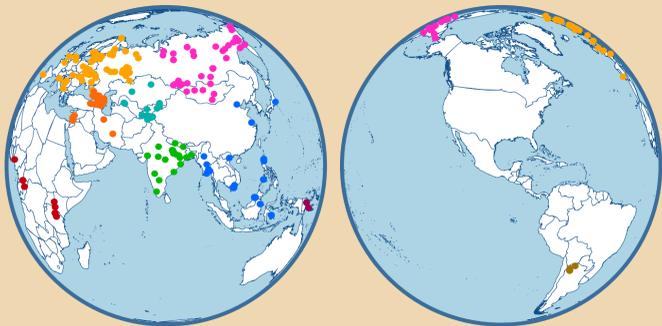


from **66 affiliated institutes** around the world



collected DNA samples from **saliva and blood**

from **456 living humans**



from **7 regions** in 5 continents



and used powerful **computer & statistical models** to analyze the data.



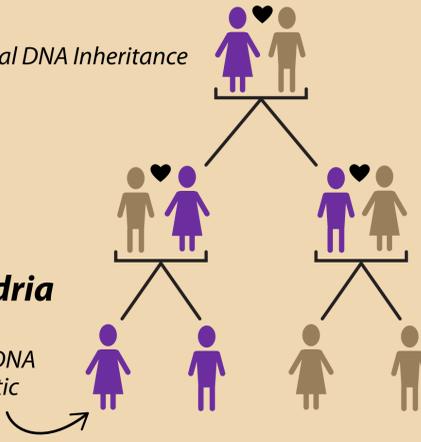
# the SCIENCE

## DNA Inheritance

**Mitochondrial DNA Inheritance**

### 1 Mitochondria

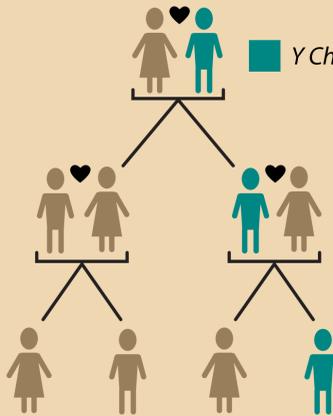
All children get mitochondrial DNA from their genetic mother.



**Y Chromosome Inheritance**

### 2 Y Chromosome

Y chromosomes are passed through the genetic male lineage.



### Why is this Important?

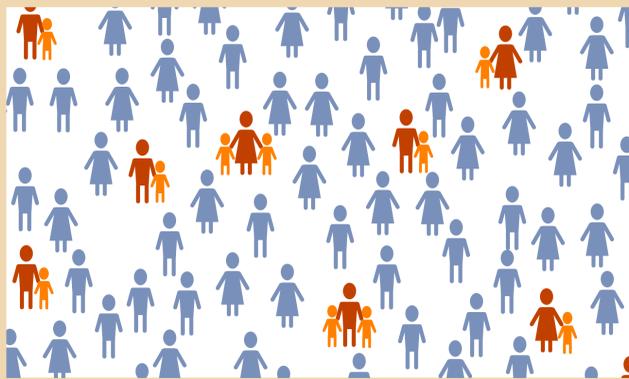
Mitochondrial DNA can be used to study the history of the genetic female lineage, and Y chromosome DNA can be used to study the history of the genetic male lineage.

## Effective Population

The census population size is the count of all the people in the population, but not all people pass on their DNA.

The effective population size is the portion of the population who passed on their DNA to their children, and grandchildren, leaving genetic relics in our DNA today that we can study to learn about our genetic history.

### Census Population



Orange icon: Effective population  
Blue icon: People without children

# the STORY



## Nomadic Life

Throughout most of prehistory, humans lived in small, nomadic, hunter and gatherer societies.

15 thousand years ago (kya)

## Rise of Agriculture

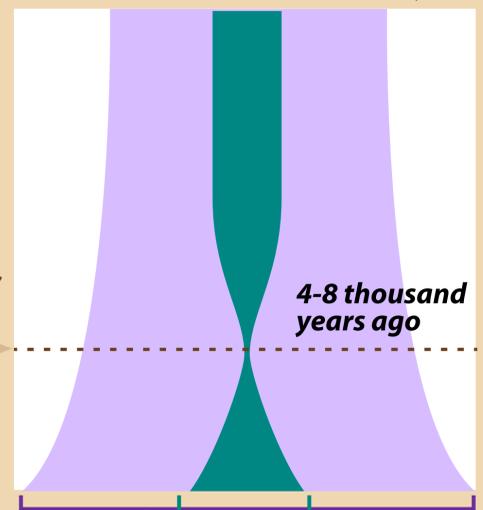
Between 8-12 thousand years ago, humans began using agriculture to grow food. This is believed to have caused a shift from nomadic to patrilocal sedentary societies.



10 kya

5 kya

## Extreme Differences in Male & Female Population History



4-8 thousand years ago

Today

Reduction of Effective Male Population



### Effective Males

Effective population size for men was significantly reduced after the onset of agriculture.



### Effective Females

Effective population size for women was not reduced after the onset of agriculture

## What could cause this?

Instead of "survival of the fittest," the accumulation of wealth and power may have increased the reproductive success of a small number of males and their sons.

# the CONCLUSIONS

1

4-8,000 years ago there was an extreme reduction in the number of males who reproduced, but not in the number females.

2

Wealth and power may have played a stronger role in shaping recent human evolution than "survival of the fittest."

3

Genetic and environmental history are important to individual health; this study gives a perspective on global genetic history that will be important to global health.

