

DNA

INTRODUCTION

DeoxyriboNucleic
Acid

A Huge Name

**for a
Huge Subject**

**Involving a Huge Number of
Very Tiny Building Blocks of
Life Itself**

**Here we will cover just a tiny
portion of the subject of DNA**

—

**That part that applies to
Genealogy**

And,

**We will try to make that highly
complex part as simple as
possible**

“Just the Basics”

DNA

USE IN GENEALOGY

IT'S ABOUT LIVE PEOPLE

IT'S PRETTY NEW – 1990's

IT'S BECOME AFFORDABLE

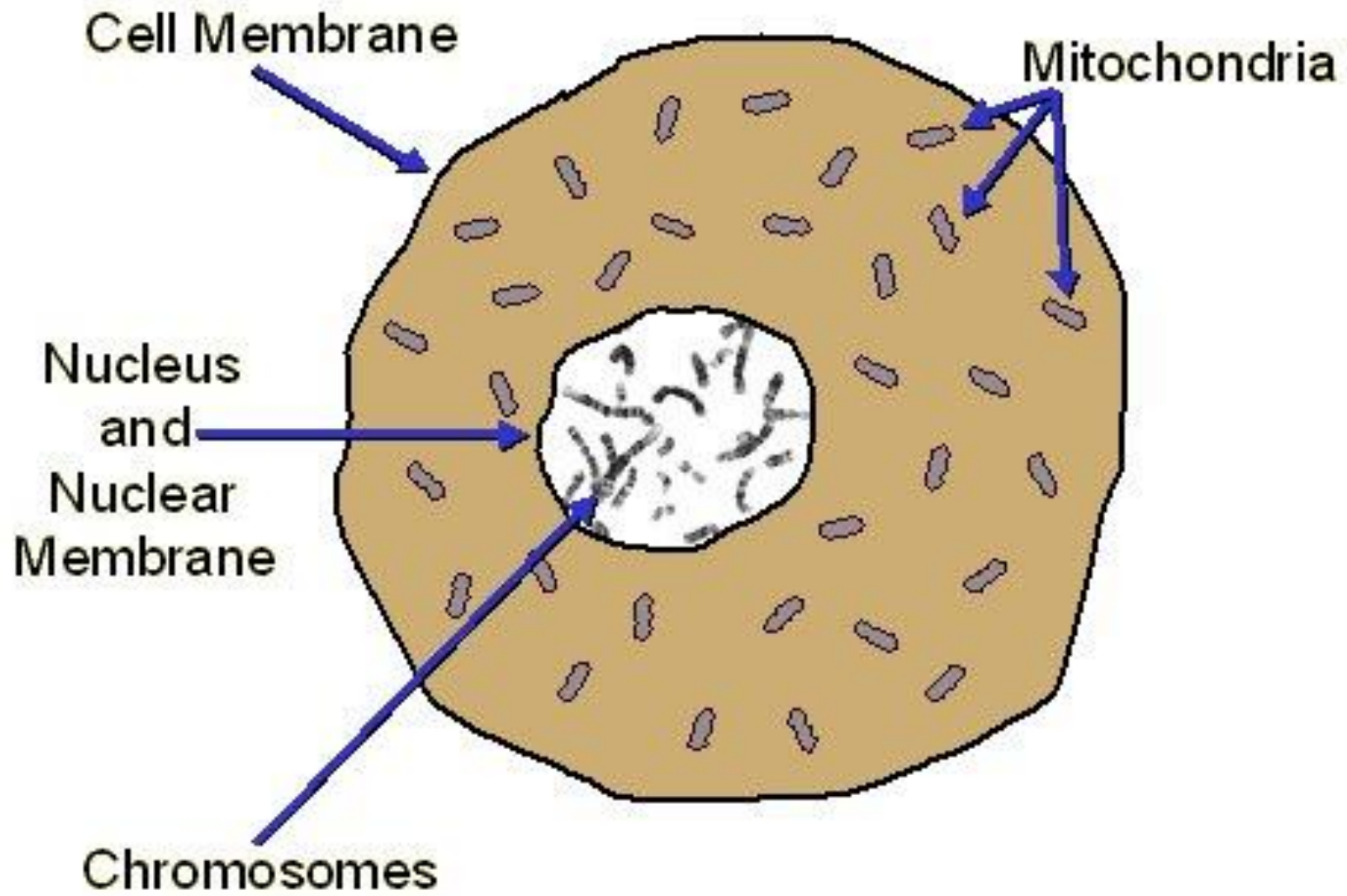
IT'S STILL EVOLVING

DNA

USE IN GENEALOGY

**A LITTLE
BIOLOGY**

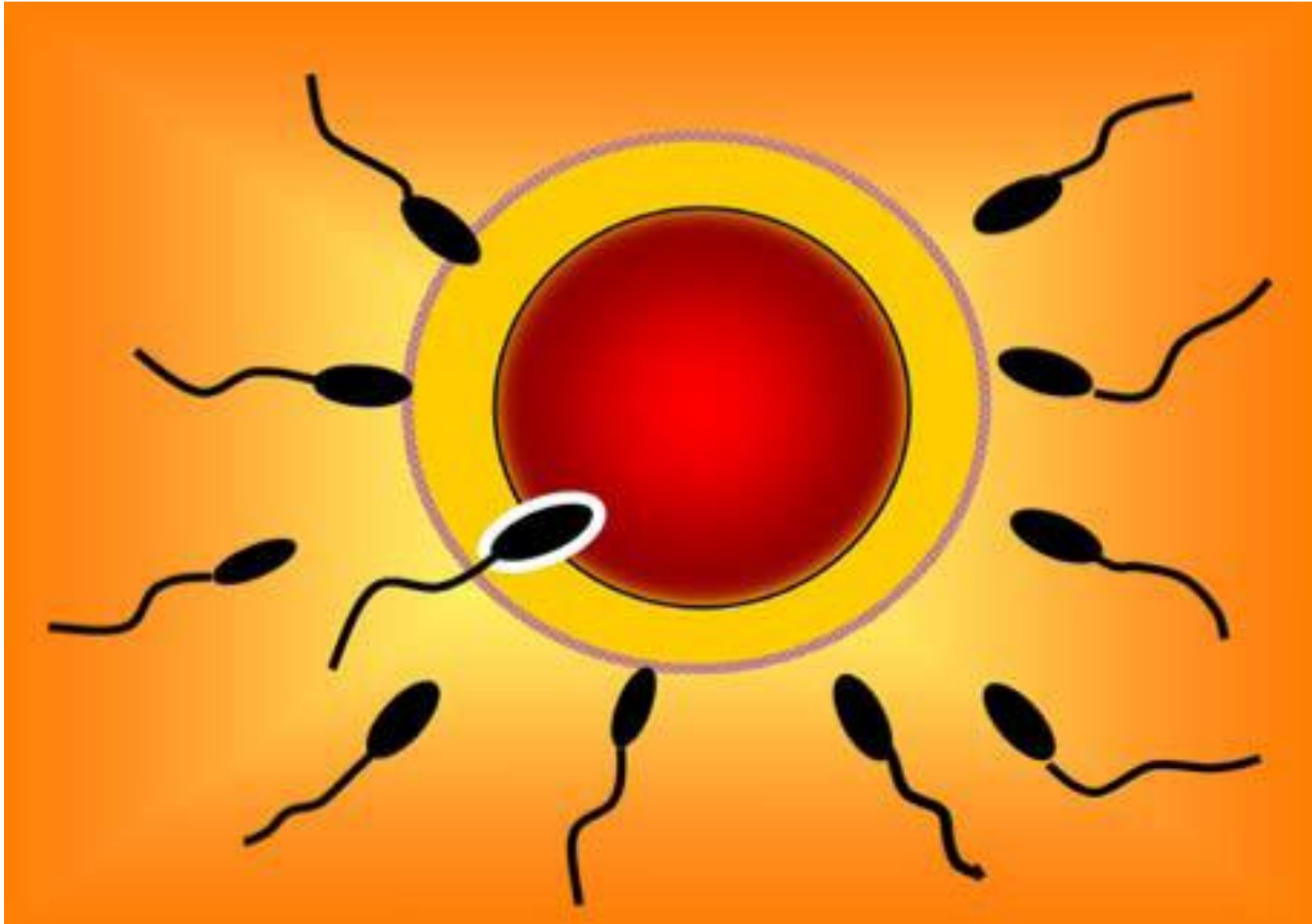
HUMAN CELLS



**WHEN A FEMALE EGG CELL
GETS FERTILIZED**

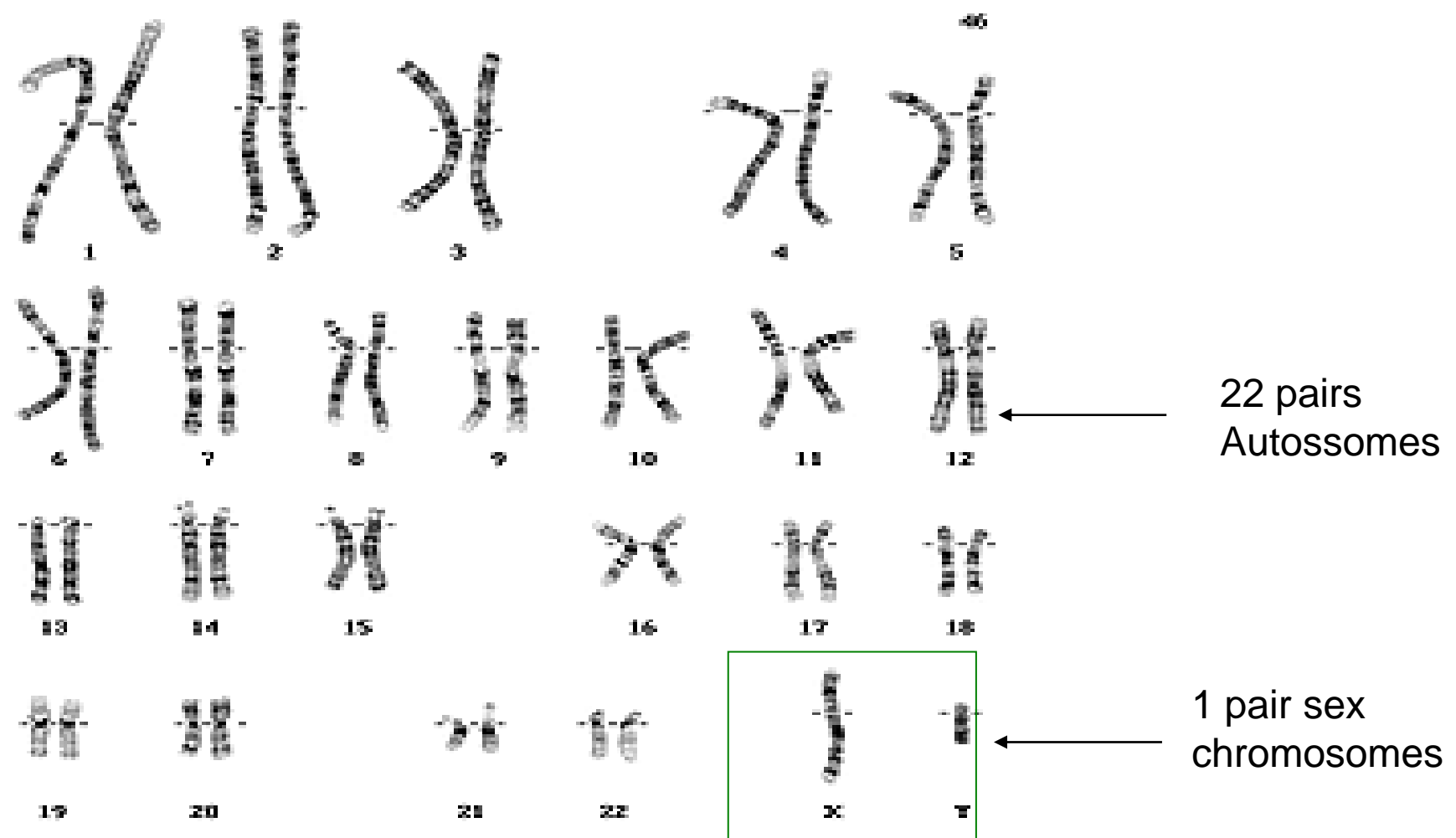
**GENES CARRIED BY THE
MALE'S SPERM MERGE WITH
THOSE OF THE FEMALE
ALREADY THERE IN**

THE EGG CELL NUCLEUS





Your genes - 46 chromosomes - 23 from each parent



**UNLIKE THE OTHER 22 -
CHROMOSOME #23 IS NOT A
COMBINATION OF PAIRS**

BUT TWO SEPARATE PARTS

-

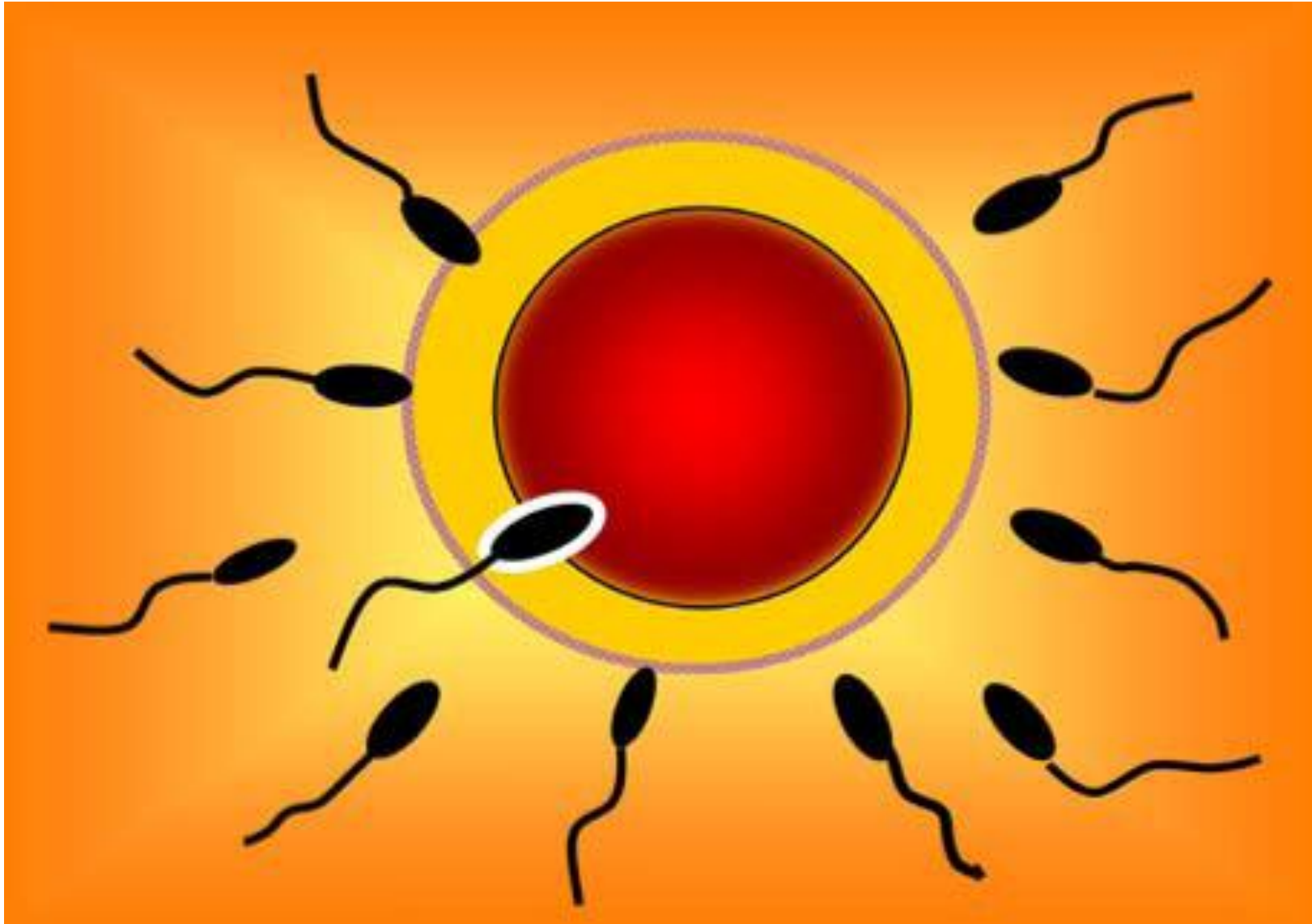
**AN “X” FROM THE MOTHER
AND EITHER ANOTHER “X”
OR A “Y” FROM THE FATHER**

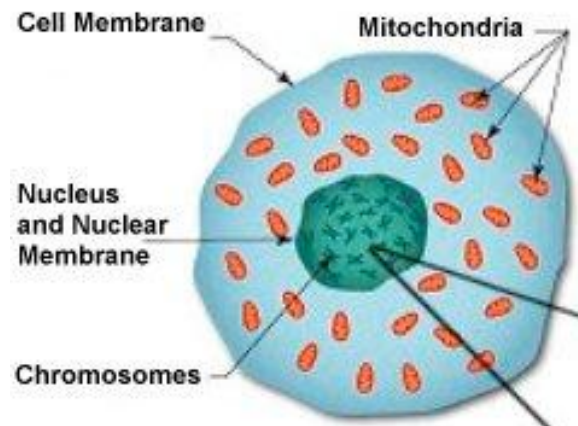
BREAKING NEWS !

**MALES AND FEMALES
ARE
DIFFERENT**

**STARTING IN
CHROMOSOME #23**

**IT ALL DEPENDS
ON WHETHER THAT SINGLE
SPERM WHICH GOT
THROUGH TO THE EGG
NUCLEUS
CARRIED
AN “X” OR A “Y” TYPE
CHROMOSOME # 23**





**Female Nucleus
only
X
chromosomes**

OR



**Male Nucleus
X and Y
chromosomes**

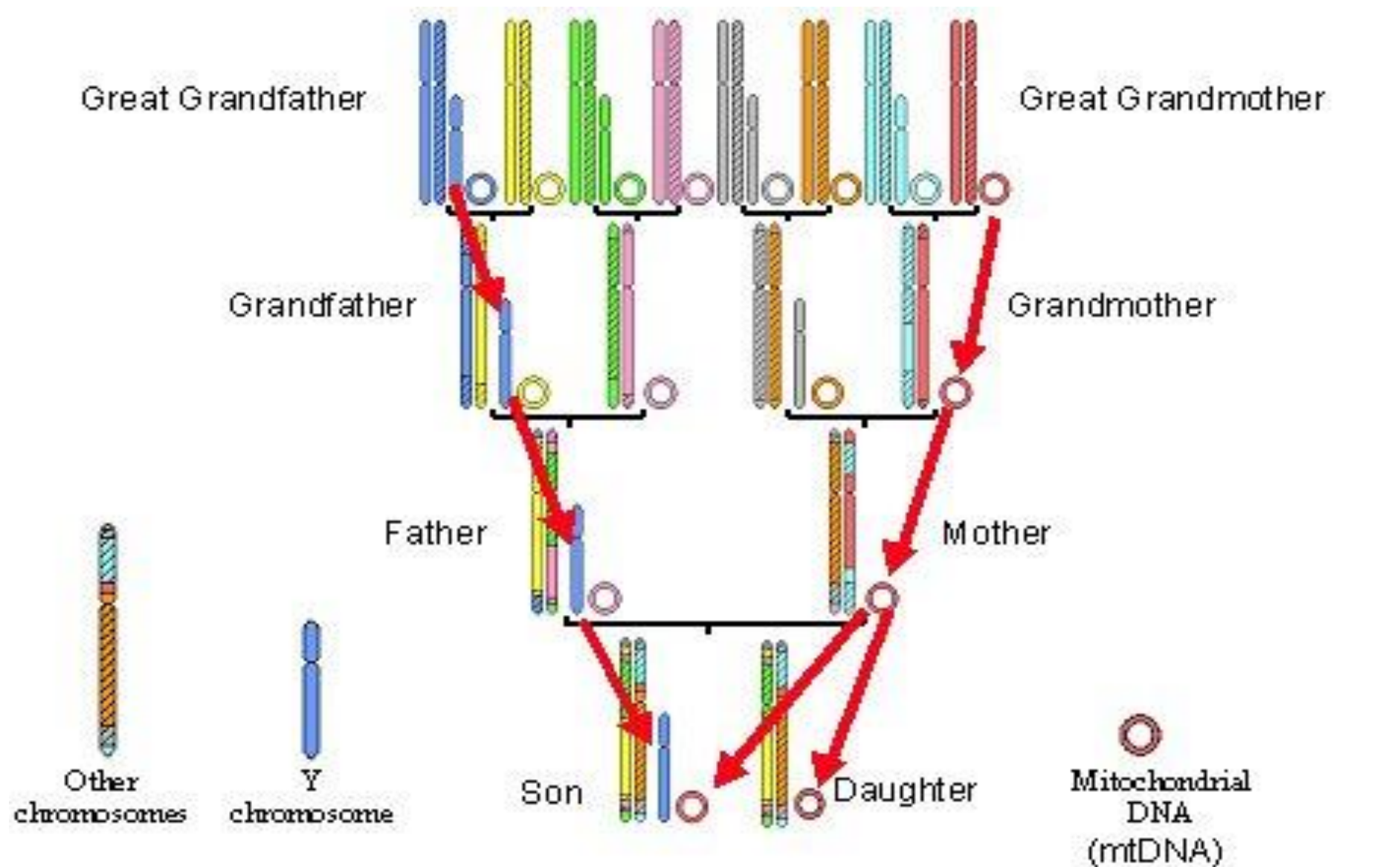


DNA for Genealogy focuses on the sex genes and not the Autosomal DNA

Males receive both Y-DNA and mtDNA

Females receive mtDNA

Since a Surname follows the male line and the Y-DNA is passed down the paternal line, this is why Surname projects are done by tracking and analyzing the Y-DNA



DNA

USE IN GENEALOGY

DOING THE TEST

World's first genealogy
driven DNA testing
company



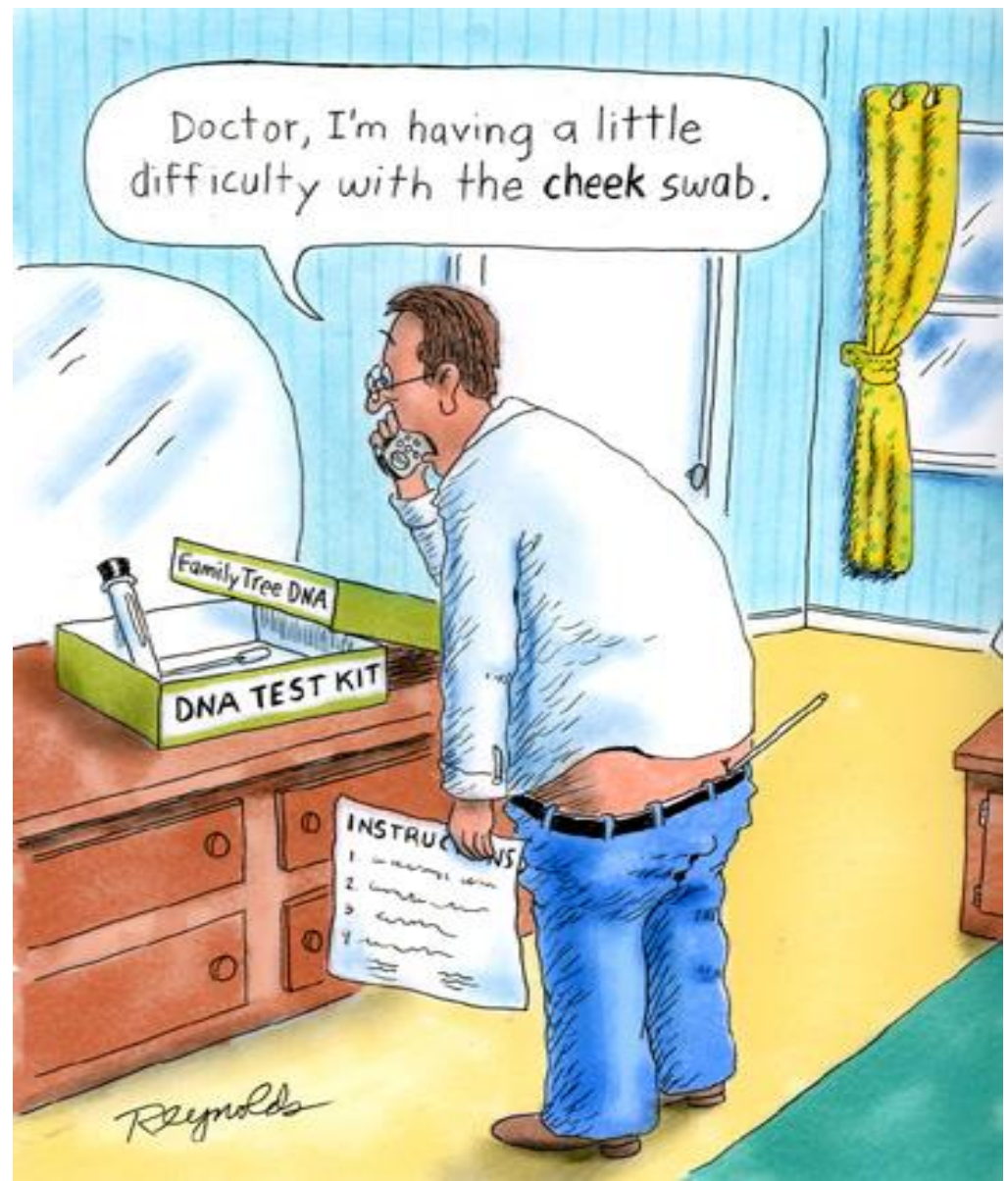
All it takes is a swab!



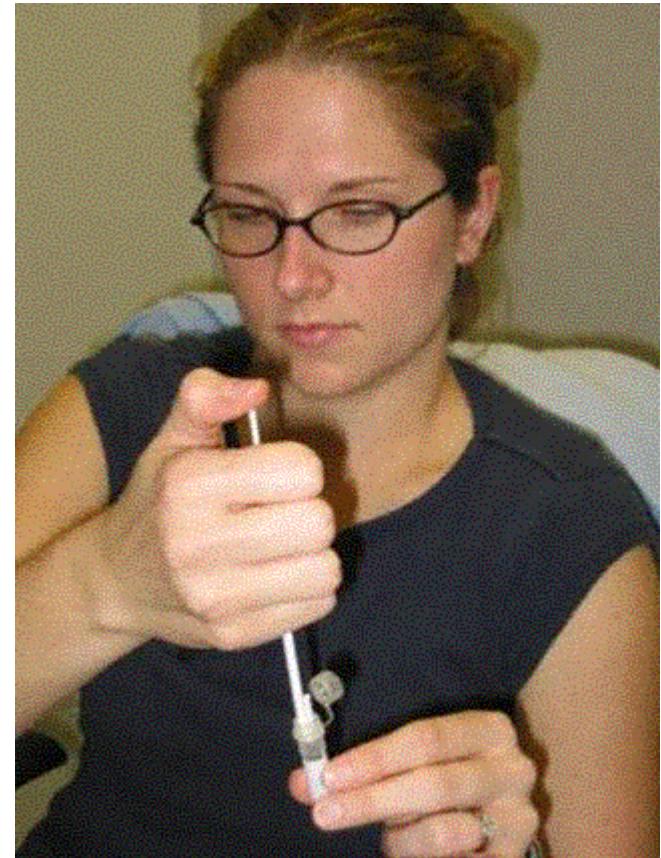
IT'S EASY

**BUT INSTRUCTIONS MUST
BE FOLLOWED**

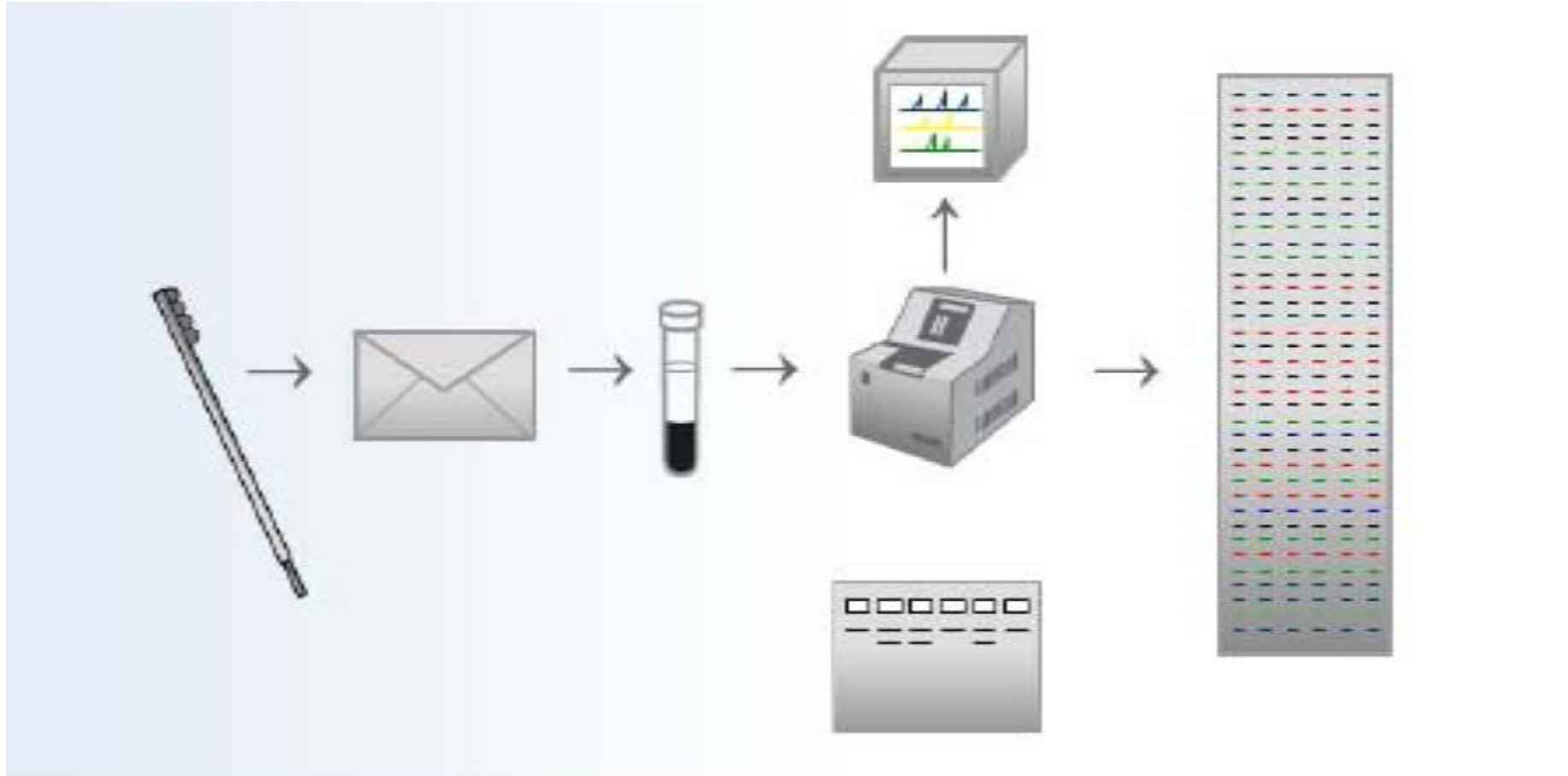
CAREFULLY



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FROM SWAB TO RESULTS

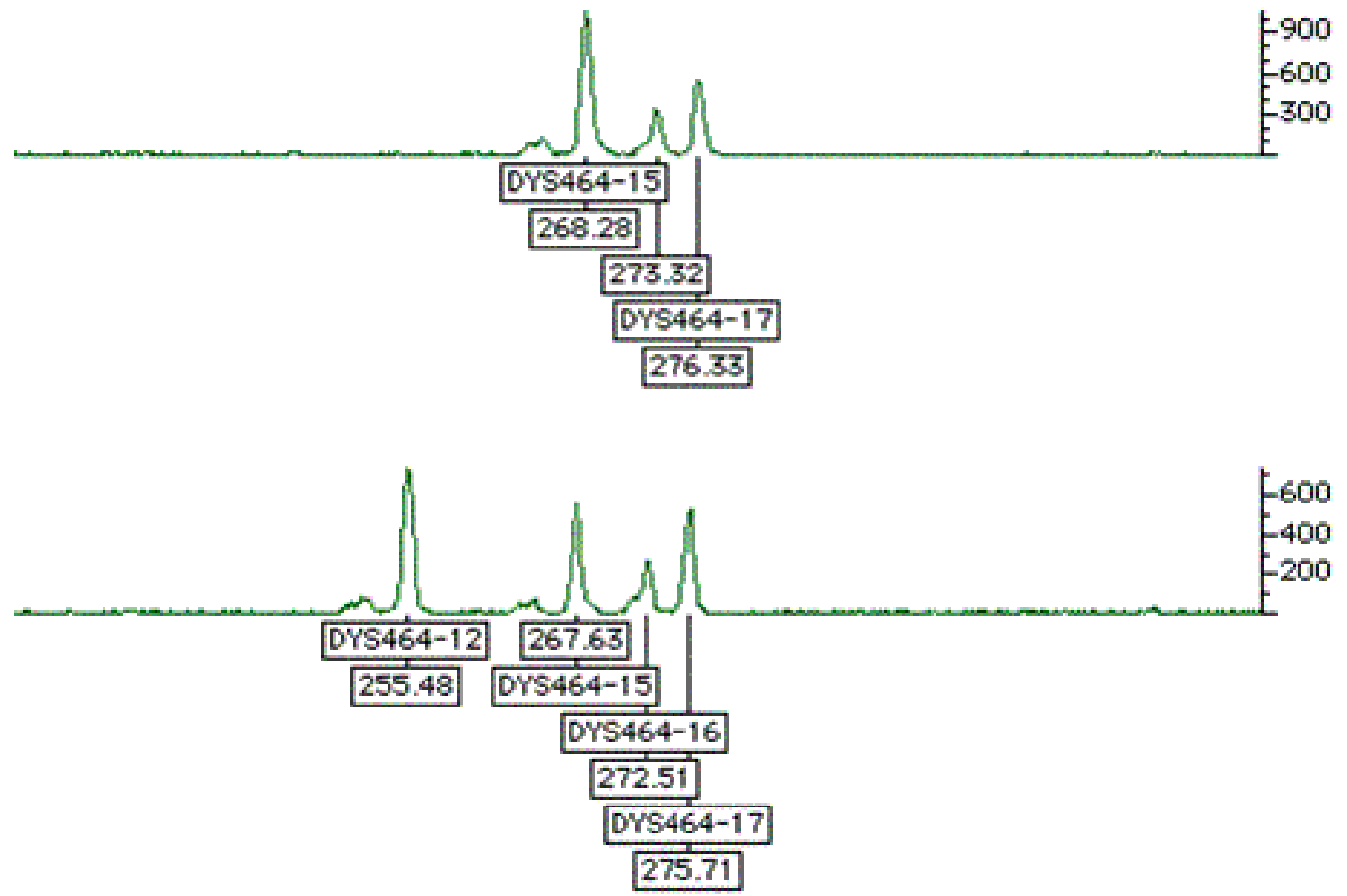


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Pherogram - Reading markers' values



FOR MALES

IT'S JUST THE

y-PART OF

CHROMOSOME #23

THAT GETS MAPPED

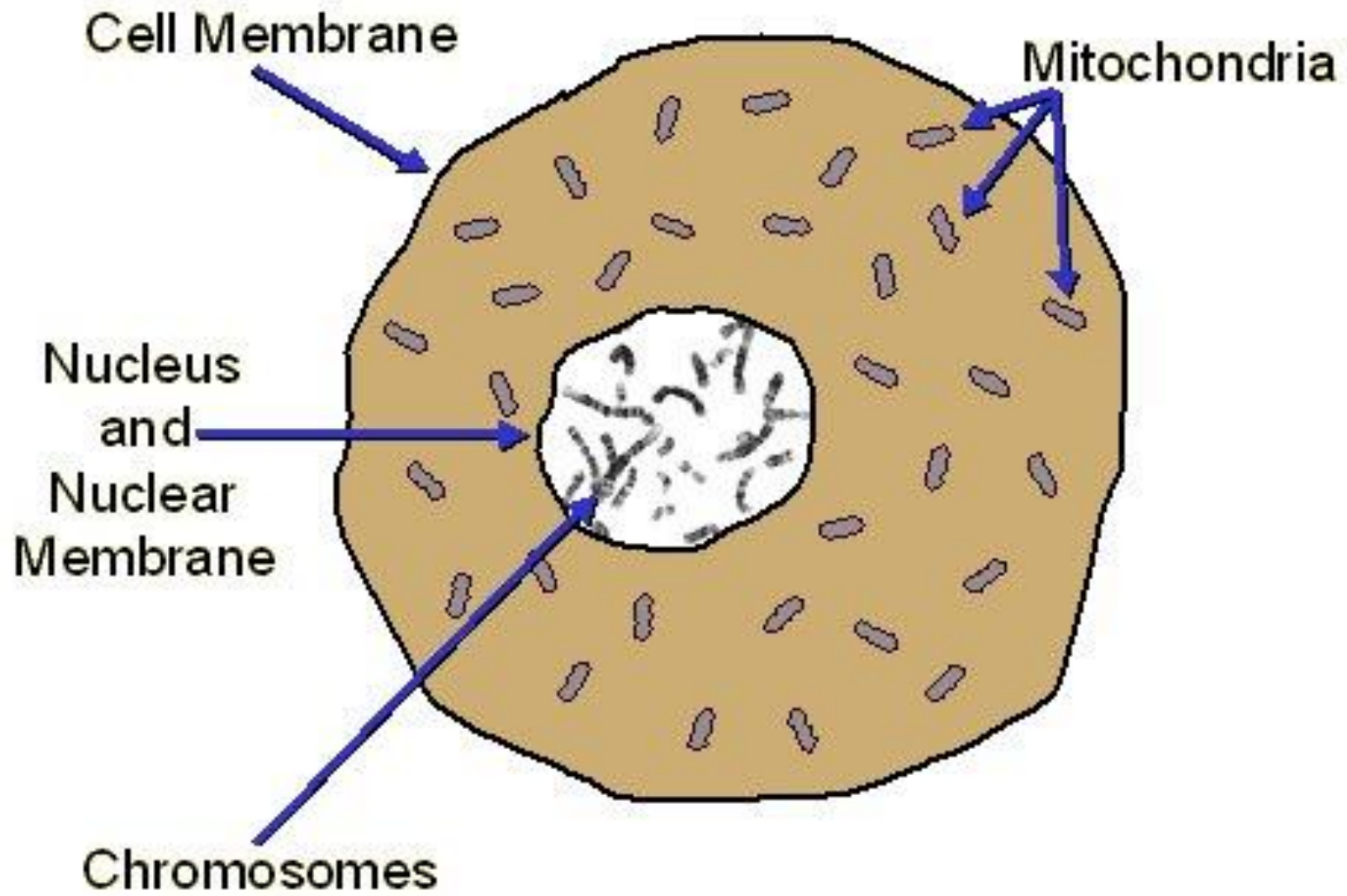
**THOSE OTHER 22 PAIRS
THAT ARE BLENDS OF THE
FATHER'S AND MOTHER'S
GENES ARE IMPORTANT**

**BUT FOR OTHER REASONS
LIKE RED HAIR, BLUE EYES,
OR MANY DISEASES**

**BUT, LADIES,
DO NOT DESPAIR!**

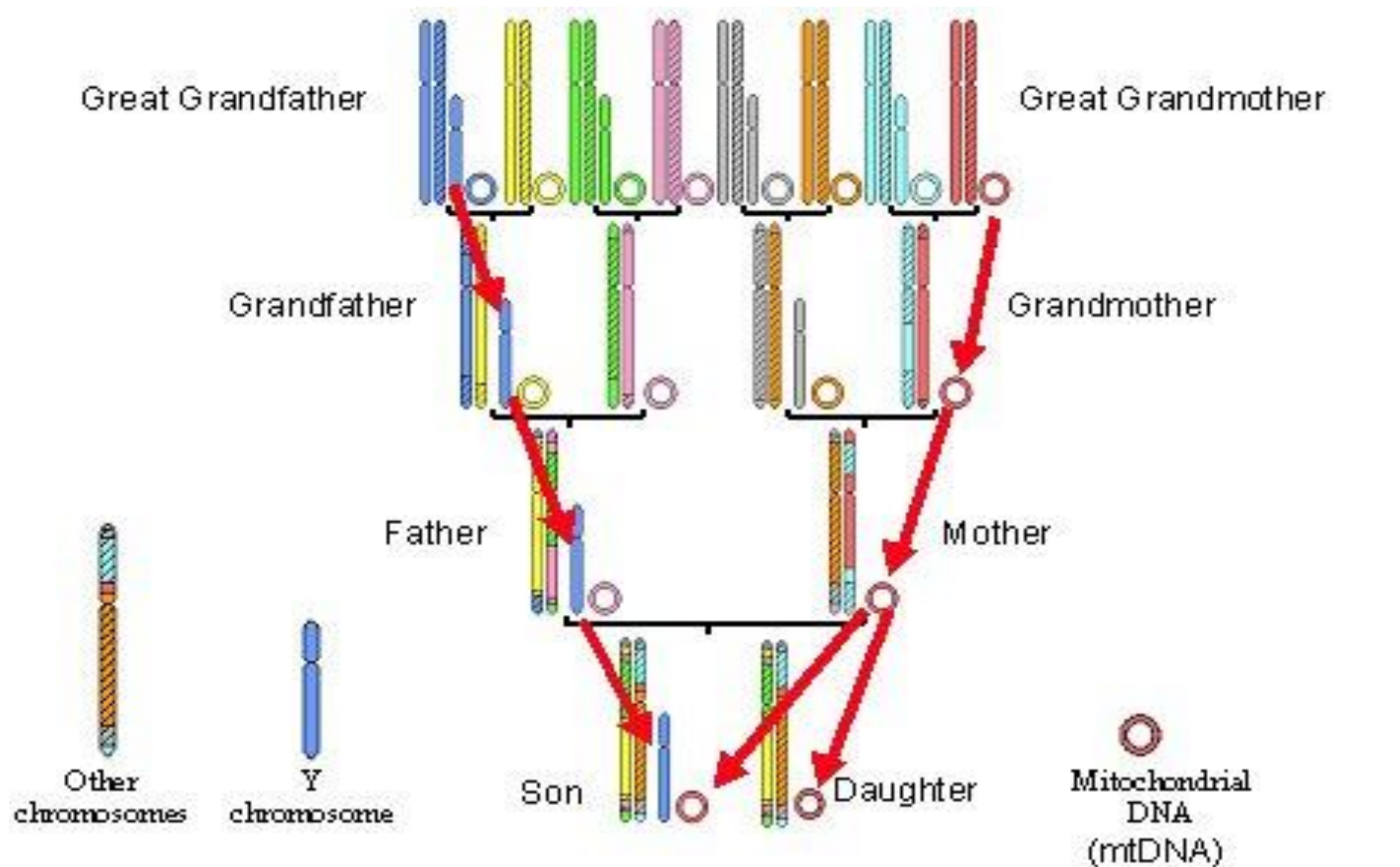
**THERE'S A DNA TEST
FOR YOU, TOO**

**REMEMBER SEEING THE
LADY SWABBING
(CORRECTLY)**



**REMEMBER, THAT SPERM
FROM THE FATHER CARRIED
ALL HIS GENES TO THE
CELL NUCLEUS**

**THE “WHITE” OF THE EGG
RETAINS ITS MAKE UP FROM
THE MOTHER ALONE**



**THAT'S WHERE THE
UNDISTURBED
MITOCHONDRIAL DNA**

[mt-DNA]

**RESIDES
AND GETS PASSED ON**

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driven DNA testing
company



**SIMILAR LABORATORY
TESTING AND MAPPING
PRODUCES
CHARACTERISTIC GENETIC
PATTERNS FOR FEMALE
ANCESTRY**

mt-DNA



Analysis of Results

	DYS 393	DYS 390	DYS 19	DYS 391	DYS 385a	DYS 385b	DYS 426	DYS 388	DYS 439	DYS 389I	DYS 392	DYS 389II
AI-001	13	22	14	10	13	14	11	14	11	12	11	28
AI-002	13	22	14	10	13	14	11	14	11	12	11	28
AI-003	13	22	14	10	13	14	11	14	11	12	11	28
AI-004	13	22	14	10	13	14	11	14	11	12	11	28
AI-005	13	22	14	10	13	14	11	14	11	12	11	28
AI-006	13	22	14	10	13	14	11	14	11	12	11	28
AI-007	13	22	14	10	13	13	11	14	11	12	11	28
AI-008	13	22	14	10	13	14	11	14	11	12	11	28
AI-009	13	22	14	10	13	14	11	14	11	12	11	28
AI-010	13	22	14	10	13	14	11	14	11	12	11	28
AI-018	13	23	14	10	13	14	11	14	11	12	11	28
AI-019	13	23	14	10	13	14	11	14	11	12	11	28
AI-020	13	23	14	10	13	14	11	14	11	12	11	28
AI-021	13	23	14	10	13	14	11	14	11	12	11	28
AI-022	13	23	14	10	13	14	11	14	12	12	11	28
AI-023	13	23	14	10	13	14	11	14	11	12	11	28
AI-024	13	23	14	11	11	14	11	14	11	12	11	28
AI-011	13	23	14	11	11	14	11	14	11	12	11	28
AI-012	13	23	14	11	11	14	11	14	11	12	11	28
AI-015	13	22	14	10	13	14	12	14	11	12	11	28
AI-013	13	22	14	10	13	14	12	14	11	12	11	28
AI-014	13	24	14	12	11	14	12	14	11	12	12	28

Yes! (Line 3)

Yes! (Line 2)

Yes! (Line 1)

Yes! (Line 4)

Well.... You know...We are all related if we go back far enough

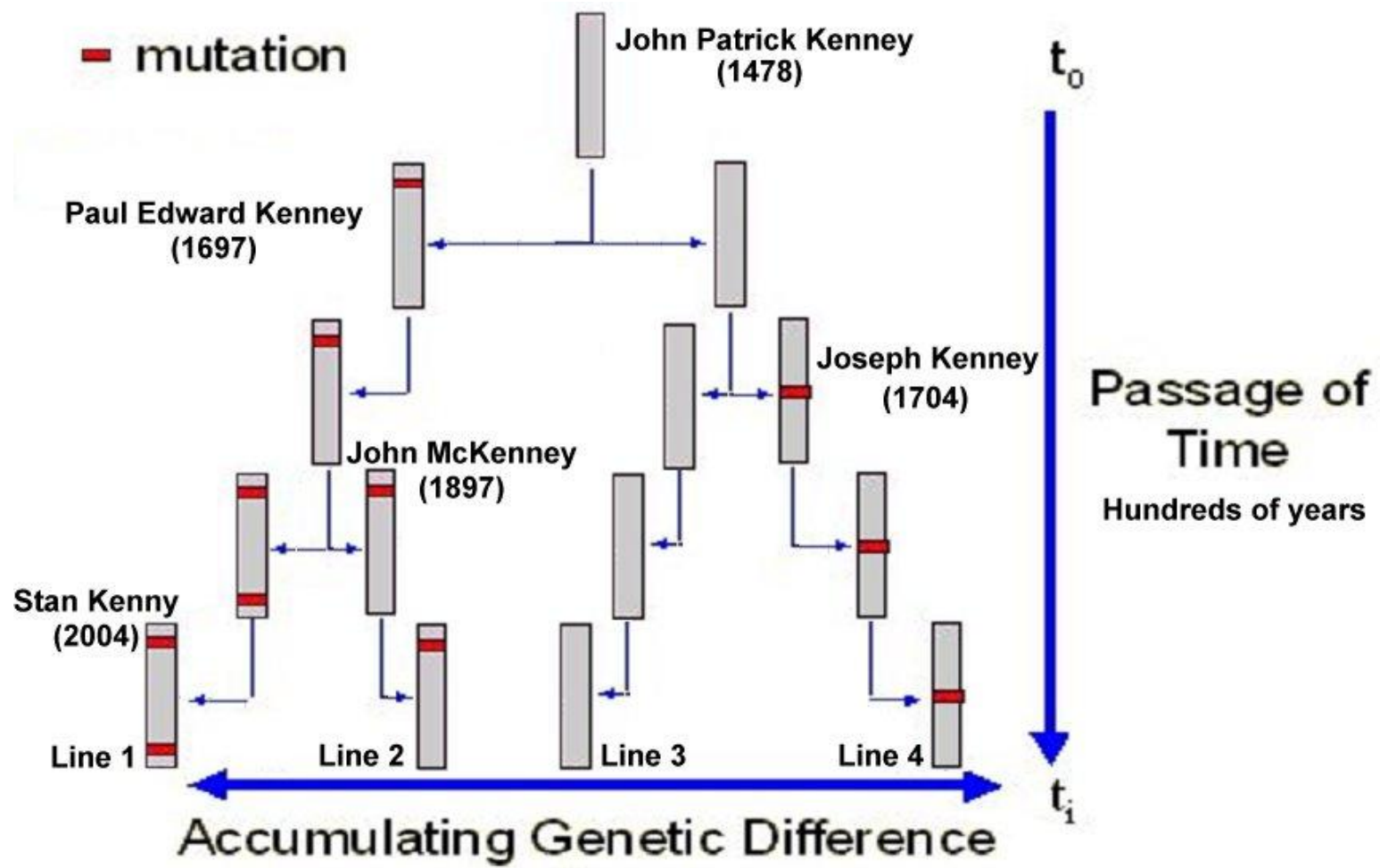
**SO, WHY ARE OUR DNA
PATTERNS DIFFERENT?**

**ANOTHER IMPORTANT
CONCEPT:**

MUTATIONS



While mutations occur with time, individuals that share a common ancestor, should show the same markers, or markers with very few mutations.



Names and examples are fictional and do not represent actual samples or families

**IT IS BELIEVED THAT ANY
SINGLE DNA “MARKER”**

**MAY NOT SHOW A MUTATION
FOR
HUNDREDS OF
GENERATIONS**

**BUT, IF WE COMPARE MANY
DNA “MARKERS”**

12 – 25 – 37 - OR NOW, 67

**THE LIKELIHOOD OF SOME
MUTATION WITHIN A FEW
GENERATIONS IS GREATER**

SO WHAT?

**BY TESTING FOR MANY DNA
“MARKERS”**

**WE CAN MORE ACCURATELY
PREDICT A
RELATIONSHIP MATCH
BETWEEN INDIVIDUALS**

AND

**WITH A HIGHER DEGREE OF
CONFIDENCE**

**“PROVE” THAT TWO
INDIVIDUALS HAD A**

COMMON ANCESTOR

WHO WAS DIFFERENT FROM

OTHER FAMILIES’

ANCESTORS

AND,

STATISTICALLY PREDICT

**HOW MANY GENERATIONS
BACK DID THEY HAVE A
MOST RECENT
COMMON ANCESTOR**

Meaning of matches for same or similar surname

Probability for Most Recent Common Ancestor (MRCA)

Number of matching markers	50% probability that the MRCA was no longer than this number of generations	90% probability that the MRCA was no longer than this number of generations	95% probability that the MRCA was no longer than this number of generations
10 of 10	16.5	56	72
11 of 12	17	39	47
12 of 12	7	23	29
23 of 25	11	23	27
24 of 25	7	16	20
25 of 25	3	10	13
35 of 37	6	12	14
36 of 37	4	8	10
37 of 37	2	5	7





Analysis of Results

Reasons for not being related within the same surname:

- Non-paternity event:
 - Adoption
 - ...Out of the wedlock...
- Same surname by coincidence:
 - Surname was assigned
 - Surname was purchased

Remember: surnames are a relatively recent feature in history (hundreds of years)

**WHAT
GENEALOGICAL
DNA TESTING**

[y-DNA or mt-DNA]

CAN AND CAN'T DO

Y-DNA or mt-DNA TESTING CAN'T

**PREDICT DISEASES
BREAK ALL BRICK WALLS
IDENTIFY ONE ANCESTOR
COMPROMISE IDENTITY**



Privacy

Stringent Guidelines for Privacy

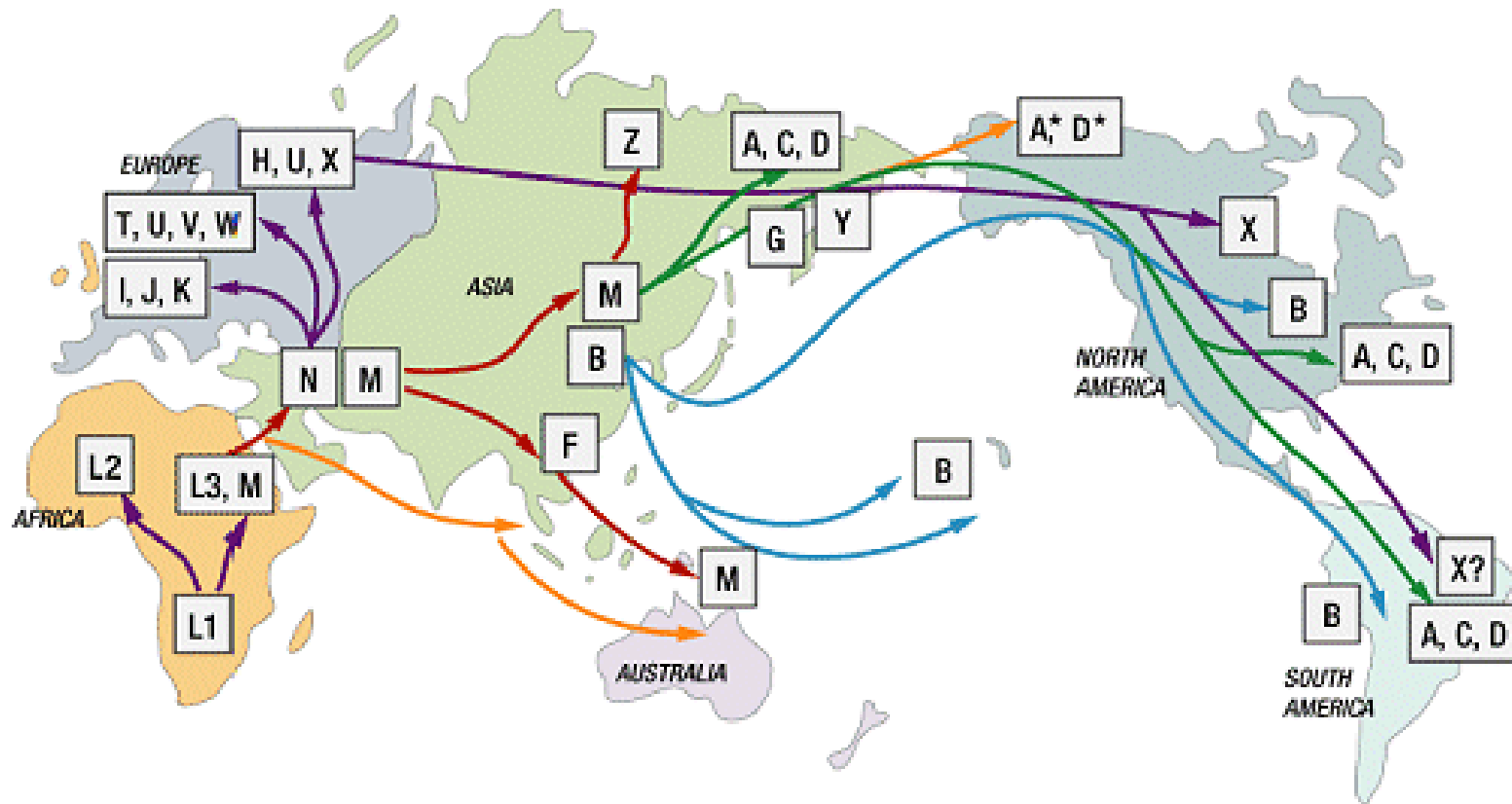
- **Double Safety net:**
 - **FTDNA controls database and test scores**
 - **University of Arizona controls the DNA sample**
- **Data is released for matching purposes only if Release Form is signed**
- **Individually computer generated locator ID and matching code for database search only accessible to customers**

**Y-DNA or mt-DNA TESTING
CAN**

**VERIFY RELATIONSHIPS
REFUTE OLD MYTHS**

**INDICATE ETHNICITY
THROUGH HAPLOGROUPS
[OPRAH WINFREY]**

HUMAN MIGRATION



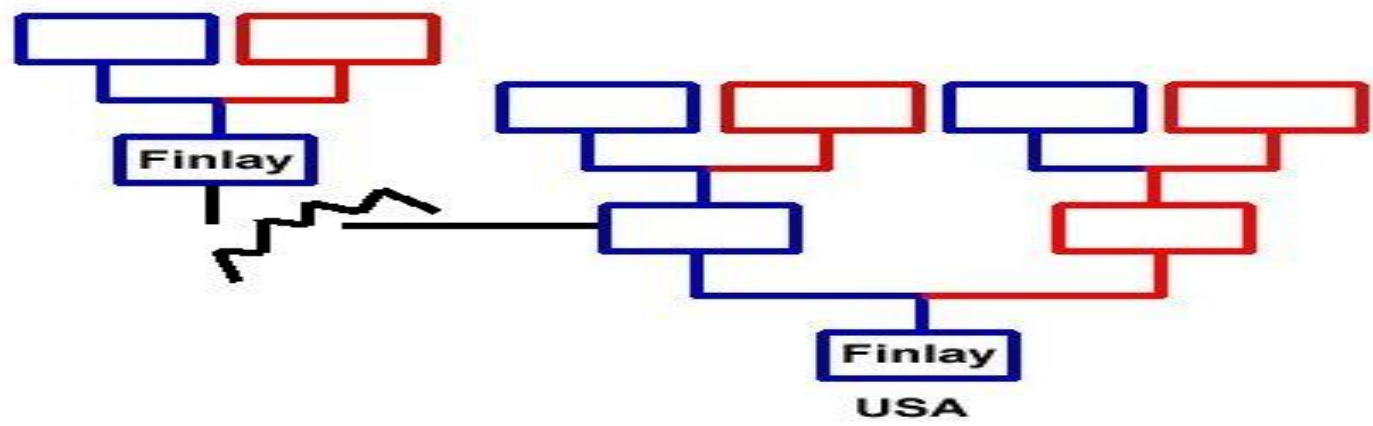
EXPANSION TIMES (years ago)

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/Esk/Aleuts	8,000 - 10,000

**SOME TYPICAL
EXAMPLES
OF WHAT DNA TESTING
MIGHT DO**



There is a point in genealogy research when the paper trail ends. Through the examination of a person's DNA, Family Tree DNA helps people by confirming or denying the existence of a common ancestor.



**FOUR PERSONAL
EXAMPLES**

THAT APPLY TO

THE KIVETT FAMILY

1.

**COMPARE SAMPLES OF PAPER
TRAIL SHOWN MALE
DESCENDANTS OF ALL 4 OF
PIETER KIEVIET 'S RECORDED
SONS TO POSITIVELY VERIFY
THESE 4 LINES.**

2.

**COMPARE SAMPLE OF MALE
DESCENDANT OF A LISTED
MALE SLAVE LIVING WITH
PIETER KIEVIET'S GRANDSON
TO DETERMINE IF HE MIGHT
HAVE BEEN MORE THAN JUST
A KIVETT SLAVE.**

3.

**COMPARE SAMPLE OF MALE
KIVETT FAMILY MEMBER LIVING
IN NJ WHOSE KNOWN DUTCH
ANCESTORS SHOW NO
DOCUMENTED CONNECTION TO
PIETER KIEVIET.**

4.

**COMPARE SAMPLES OF MALE
KIVETT OR OTHER SURNAME
MALES LIVING IN EUROPE WHO
HAVE DOCUMENTED ORIGINS,
AND MATCH USA KIVETT Y-DNA**

DNA

**A POWERFUL
GENEALOGICAL TOOL
WELL WORTH**

CONSIDERING



“You don’t look anything like the long haired, skinny kid I married 25 years ago. I need a DNA sample to make sure it’s still you.”

QUESTIONS ?

AND MAYBE

SOME

ANSWERS

FOR MORE

GO TO

www.familytreedna.com