A Beginner's Guide to Using DNA To Research Your Family Tree

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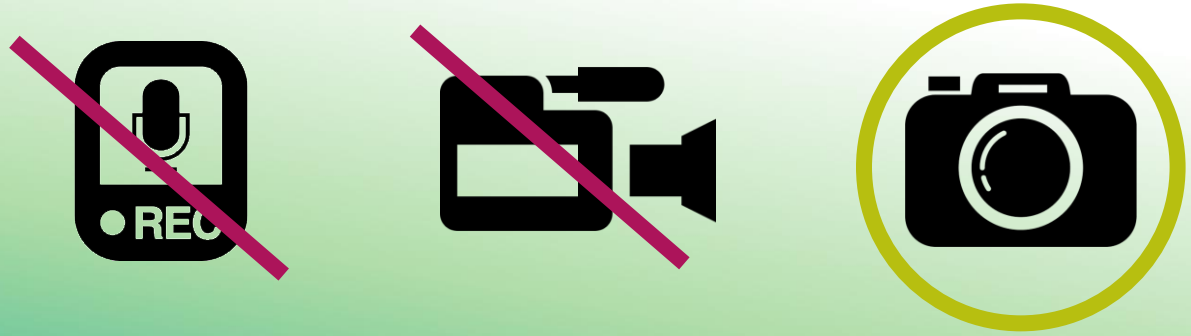
- Please silence all electronic devices
- No audio or video recording
- Photos allowed



rootstech
by FamilySearch

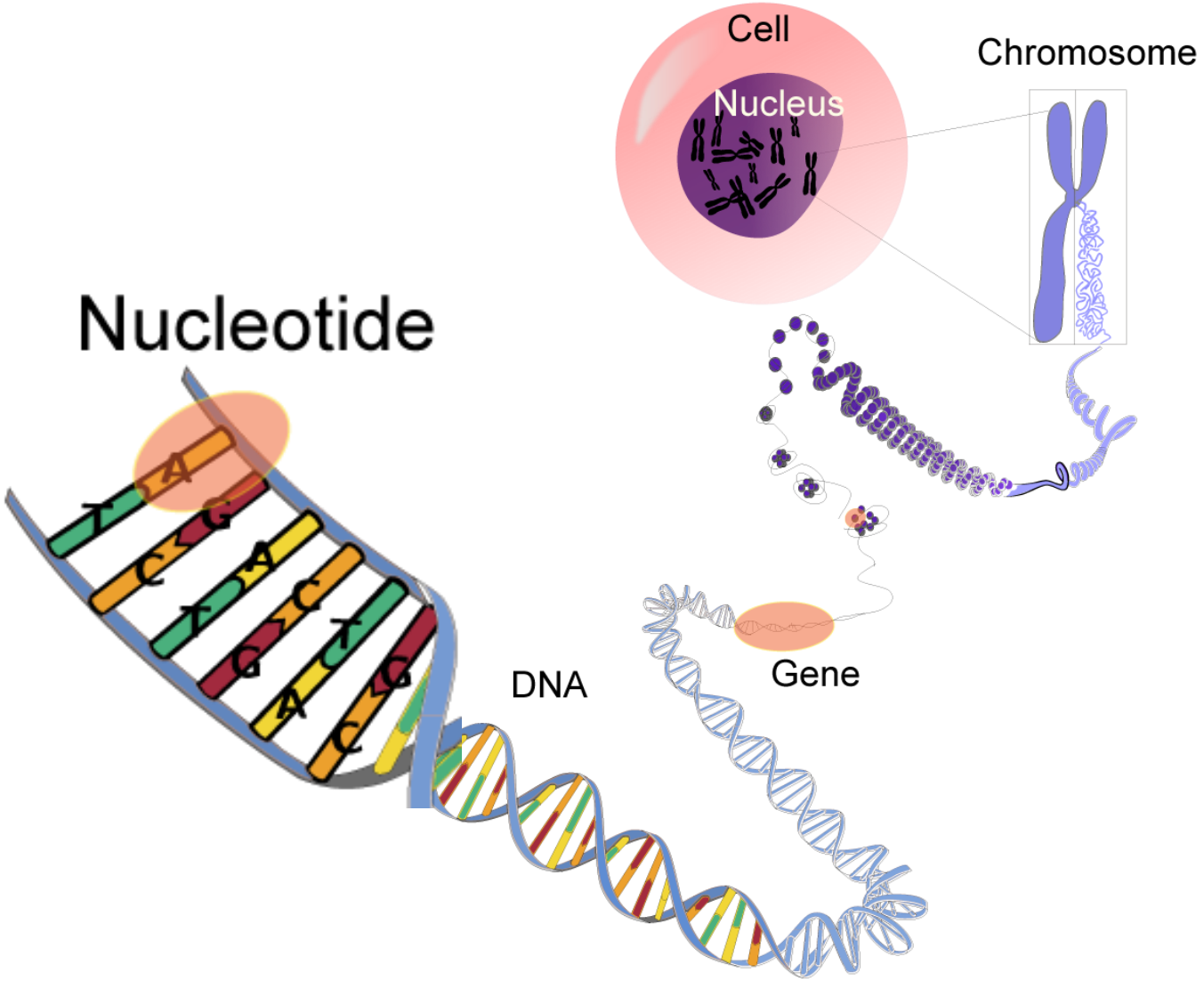
A PDF of these slides is available on the home page of ConnectTheBranch.com.

Learning Outcomes

1. How DNA is inherited from your ancestors.
2. The information and tools on the “DNA Results” pages.
3. How DNA provides genealogical evidence.
4. Strategies to organize and use your DNA matches to confirm and extend your tree.

DNA

DeoxyriboNucleic Acid (DNA)

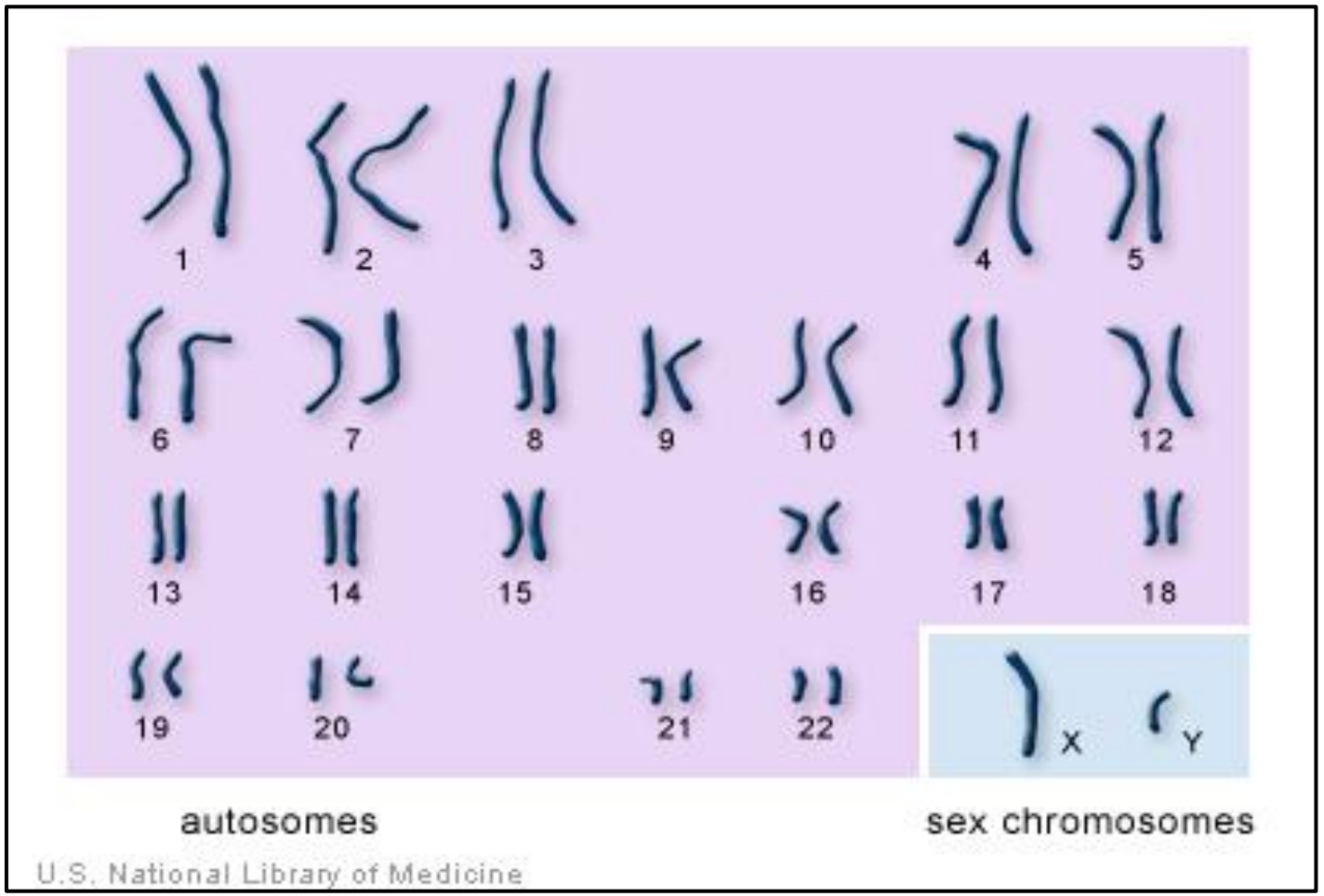


Credit: WaSu-Bio, CC0, via Wikimedia Commons

Chromosomes

You have two copies of each chromosome.

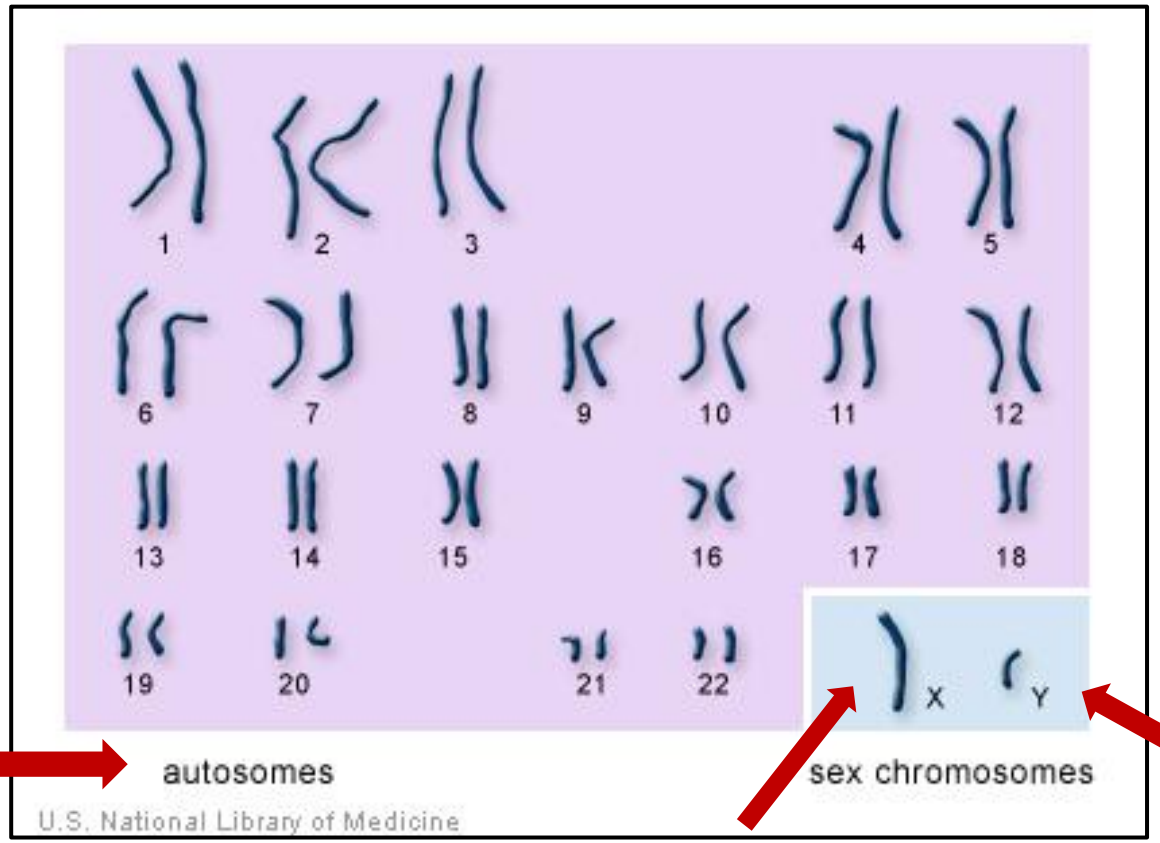
You get one copy from each parent.



Credit: https://medlineplus.gov/genetics/understanding/basics/howmanychromosomes/

Types of DNA

There are four types of DNA,
each with a unique inheritance pattern.



1) autosomal DNA on 22 chromosomes

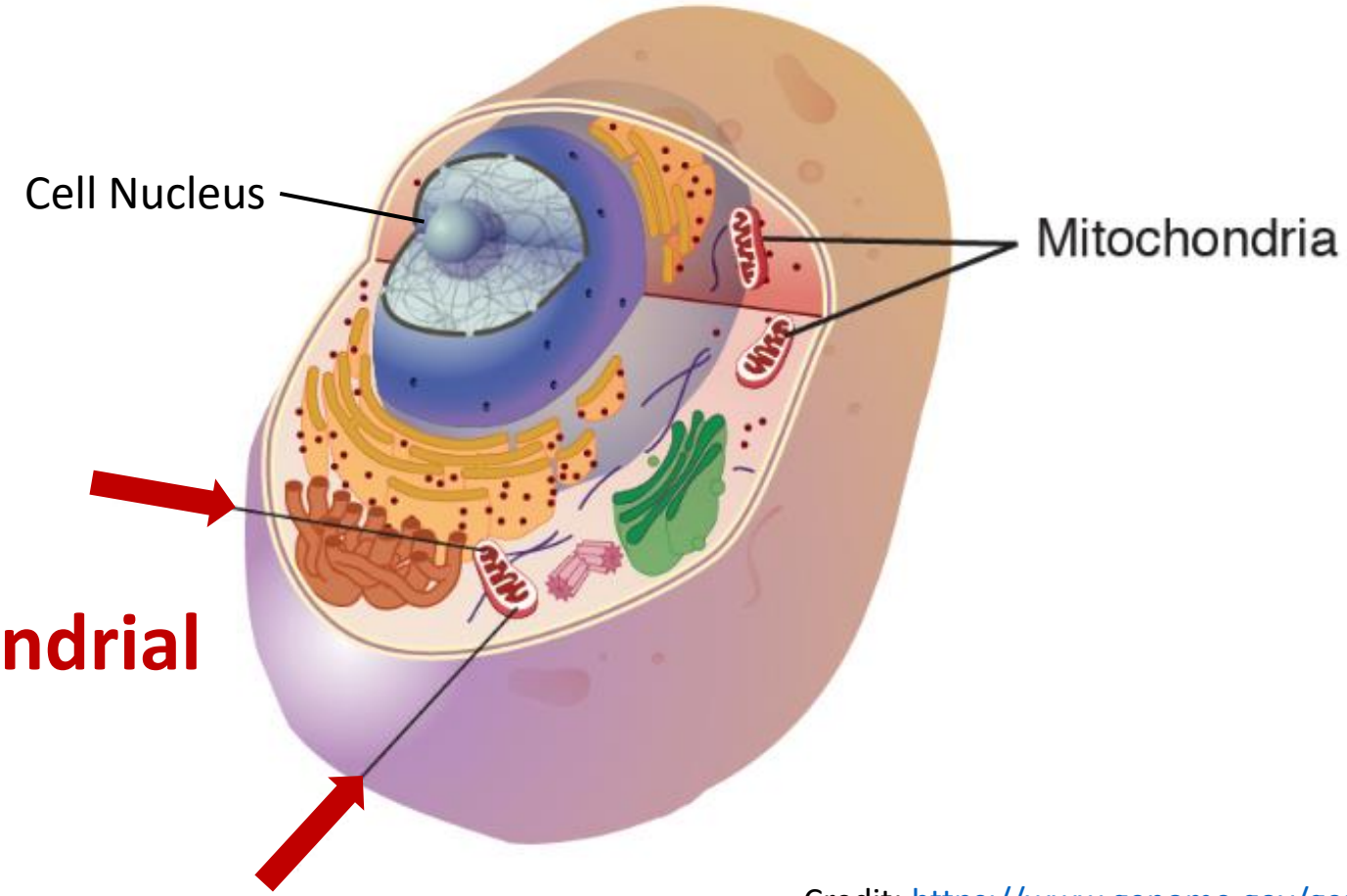
2) X DNA

3) Y DNA

Credit: https://medlineplus.gov/genetics/understanding/basics/howmanychromosomes/

Types of DNA

Mitochondrial DNA:



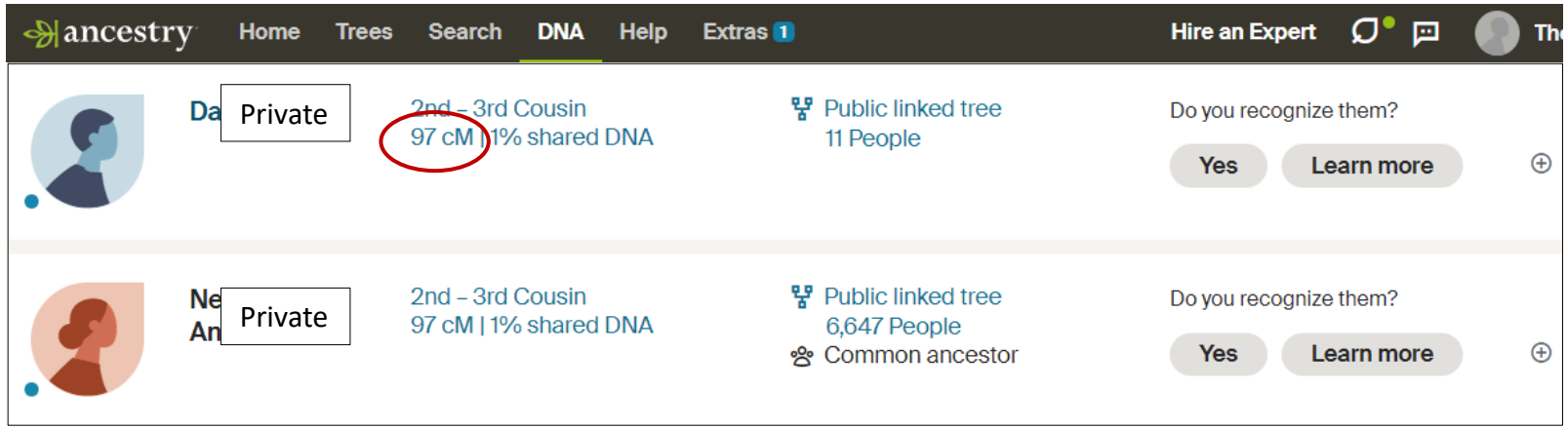
4) Mitochondrial DNA

Credit: https://www.genome.gov/genetics-glossary/Mitochondria

Centimorgans

Segments of DNA are often measured in centimorgans (cM).

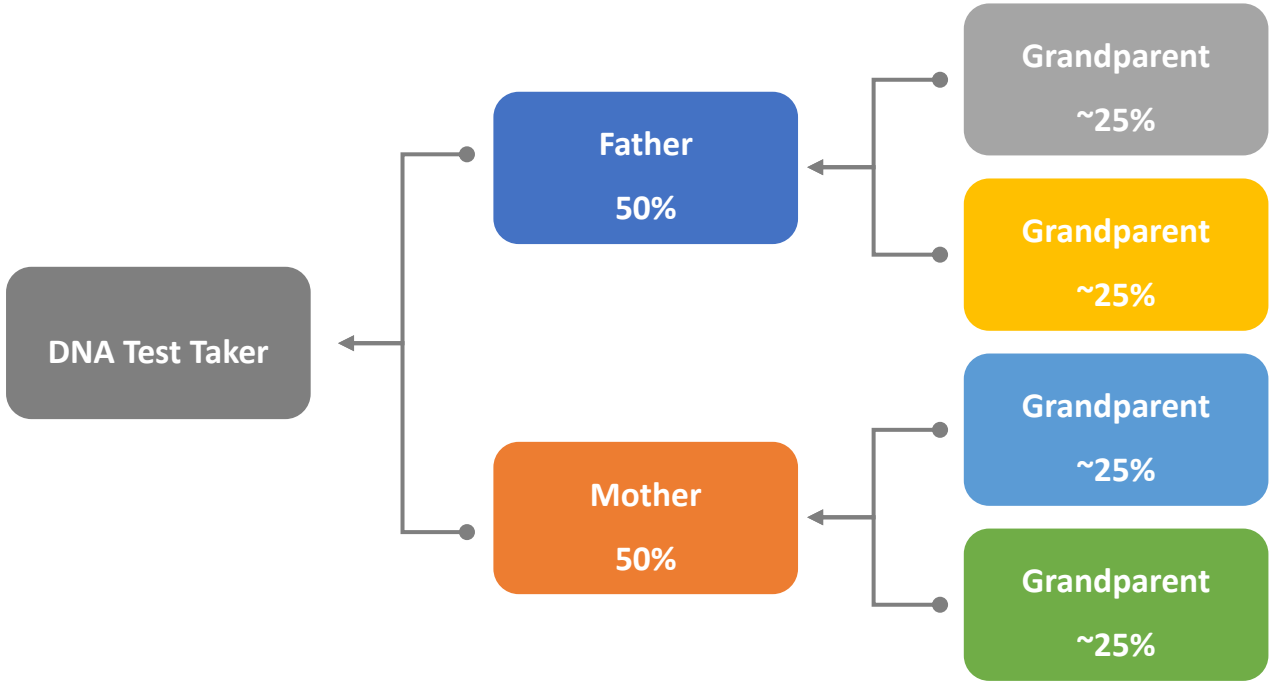
- cM is not a measurement of length.
- cM is a measurement of genetic distance.



Living DNA test takers shown in this presentation consented to their data being shown or their names are changed/redacted.

Inheritance

A person inherits about 25% from each grandparent and 12.5% from each great-grandparent, etc.

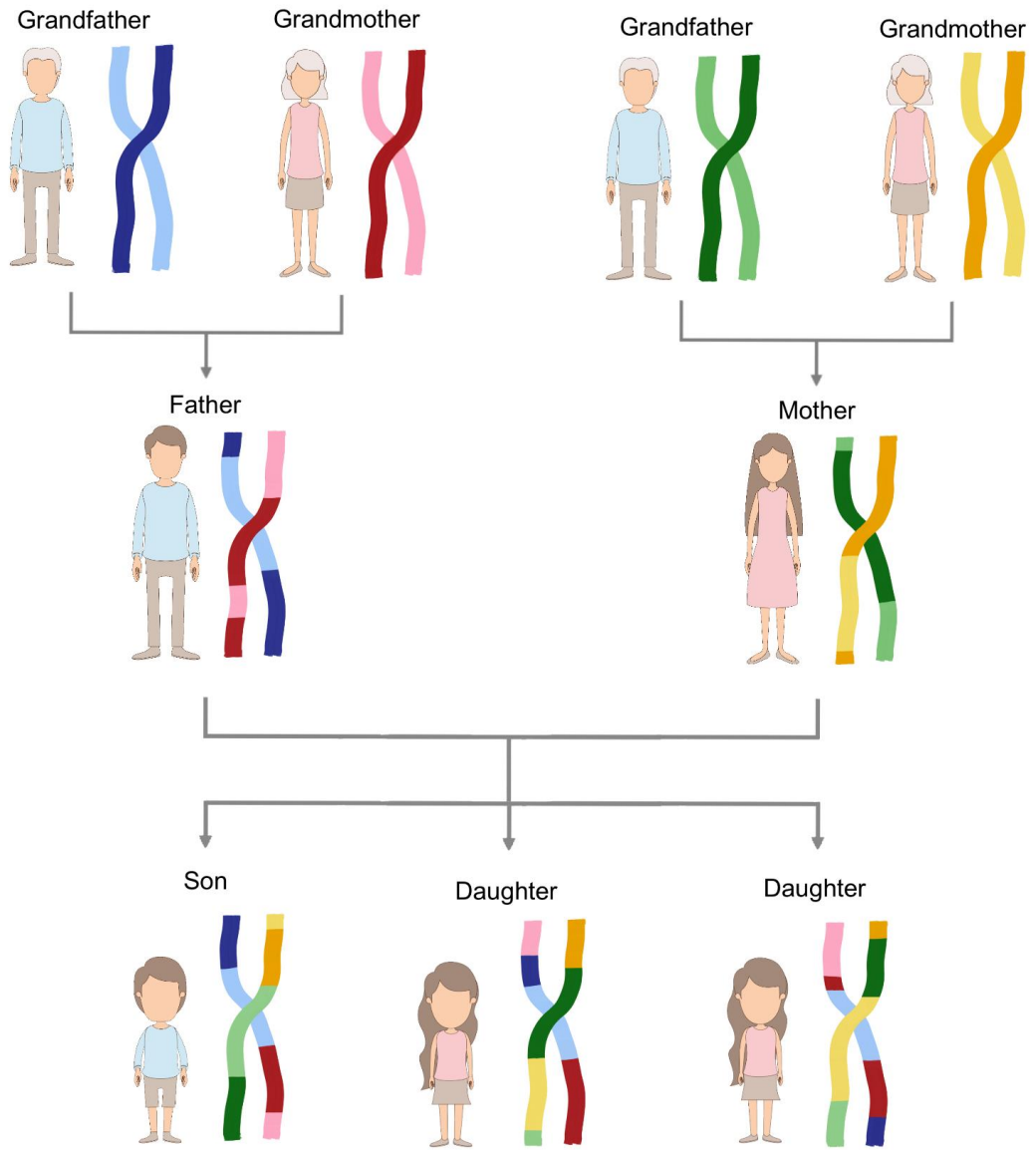


Not all your distant cousins will share autosomal DNA with you.

Recombination

Autosomal DNA *recombines* (shuffles) each time a child is created.

Recombination is an exchange of DNA segments between the maternal and paternal chromosomes.



Where Do I Test?

TIPS: Test the oldest possible candidate.
Holidays and Black Friday have the cheapest deals.

Company	AncestryDNA	23andMe	MyHeritage	Family Tree DNA
Type of DNA test	Autosomal	Autosomal	Autosomal	Autosomal, Y-DNA, or Mitochondrial
People in the database (Oct 2022)	21,000,000 people	12,800,000 people	6,000,000	1,200,000
Upload DNA from other companies?	No	No	Yes	Yes
Segment data?	No	Yes	Yes	Yes

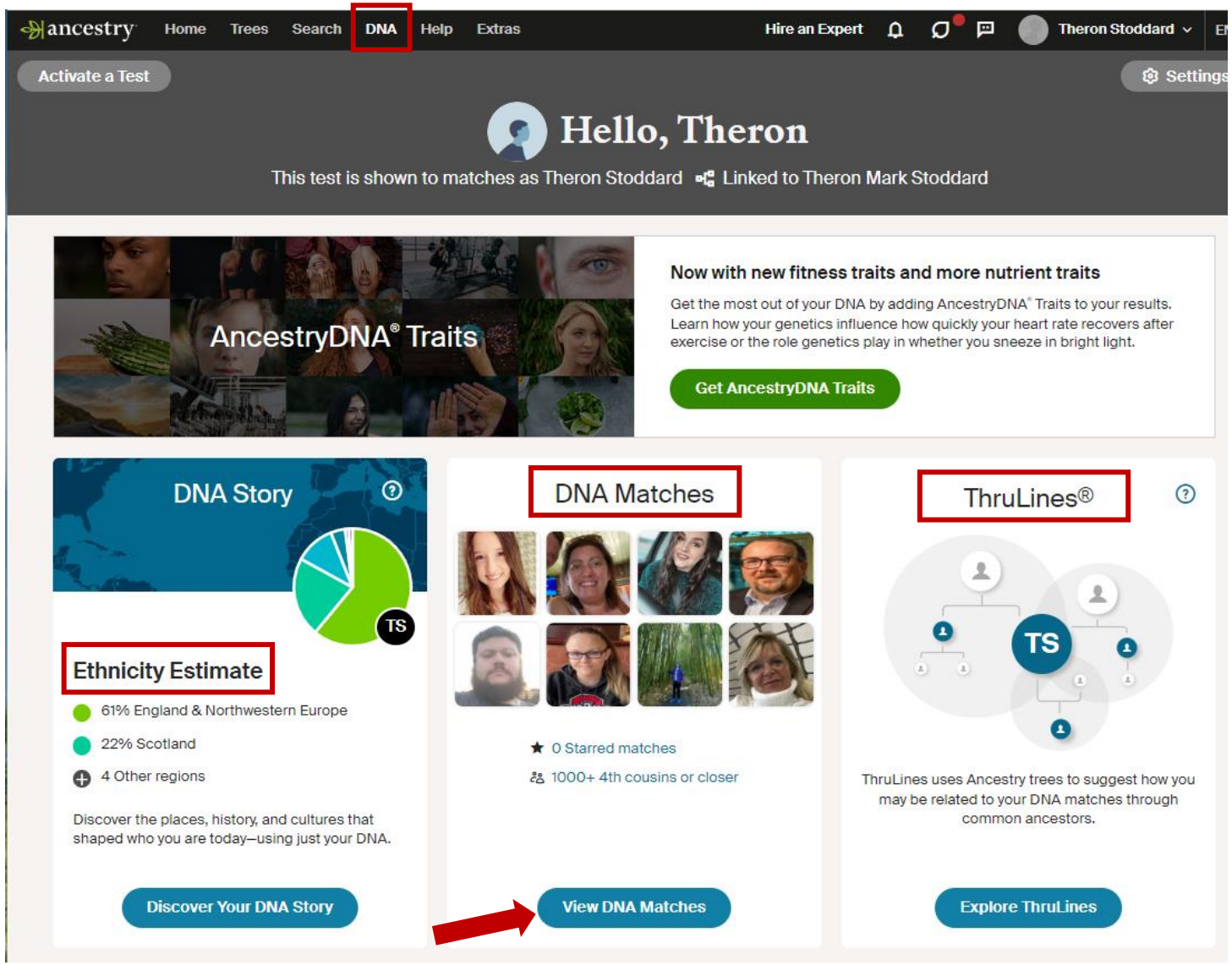
Information from https://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

Fish in all ponds

Transfer your DNA to other databases that allow it.

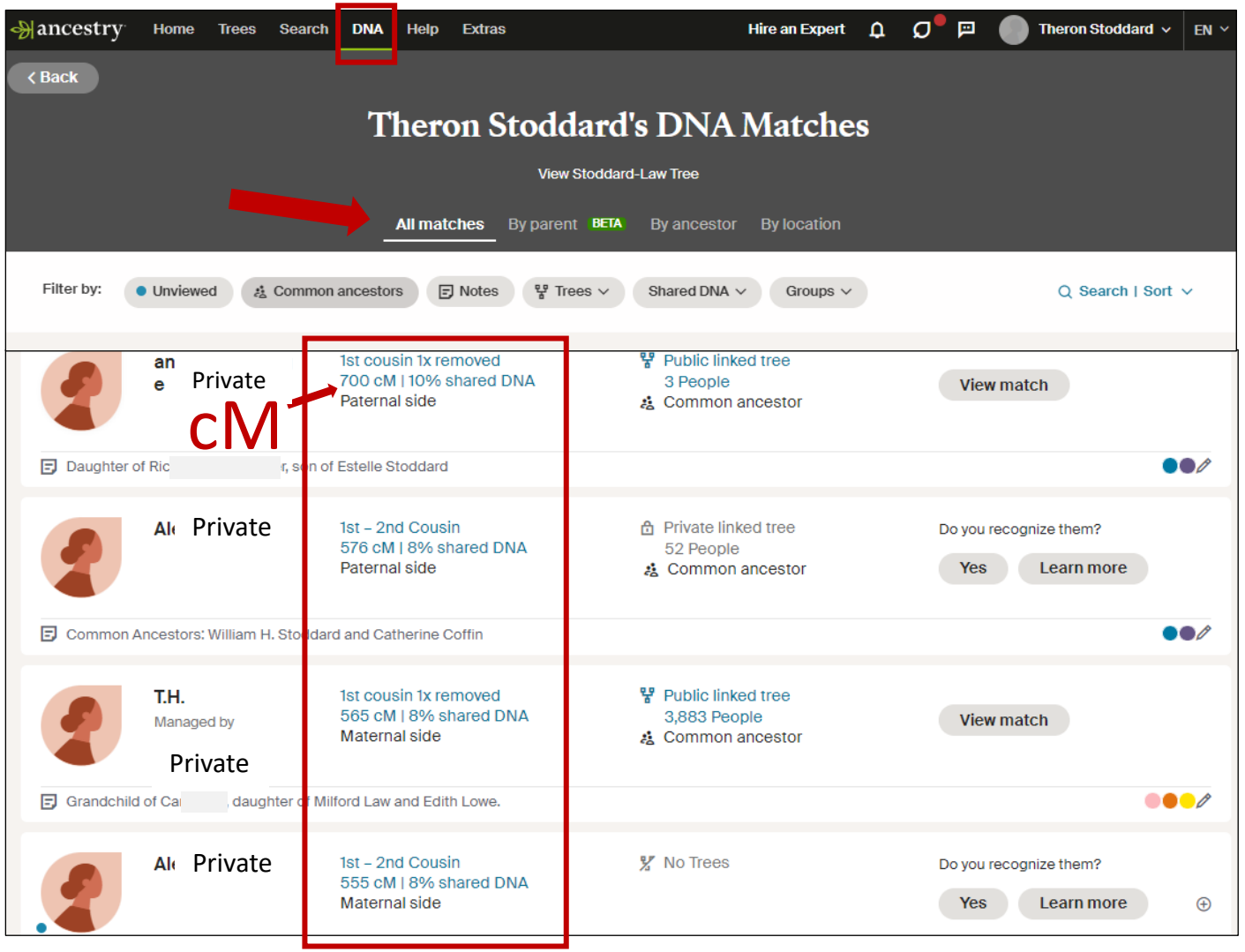
Your DNA Results

AncestryDNA Landing Page



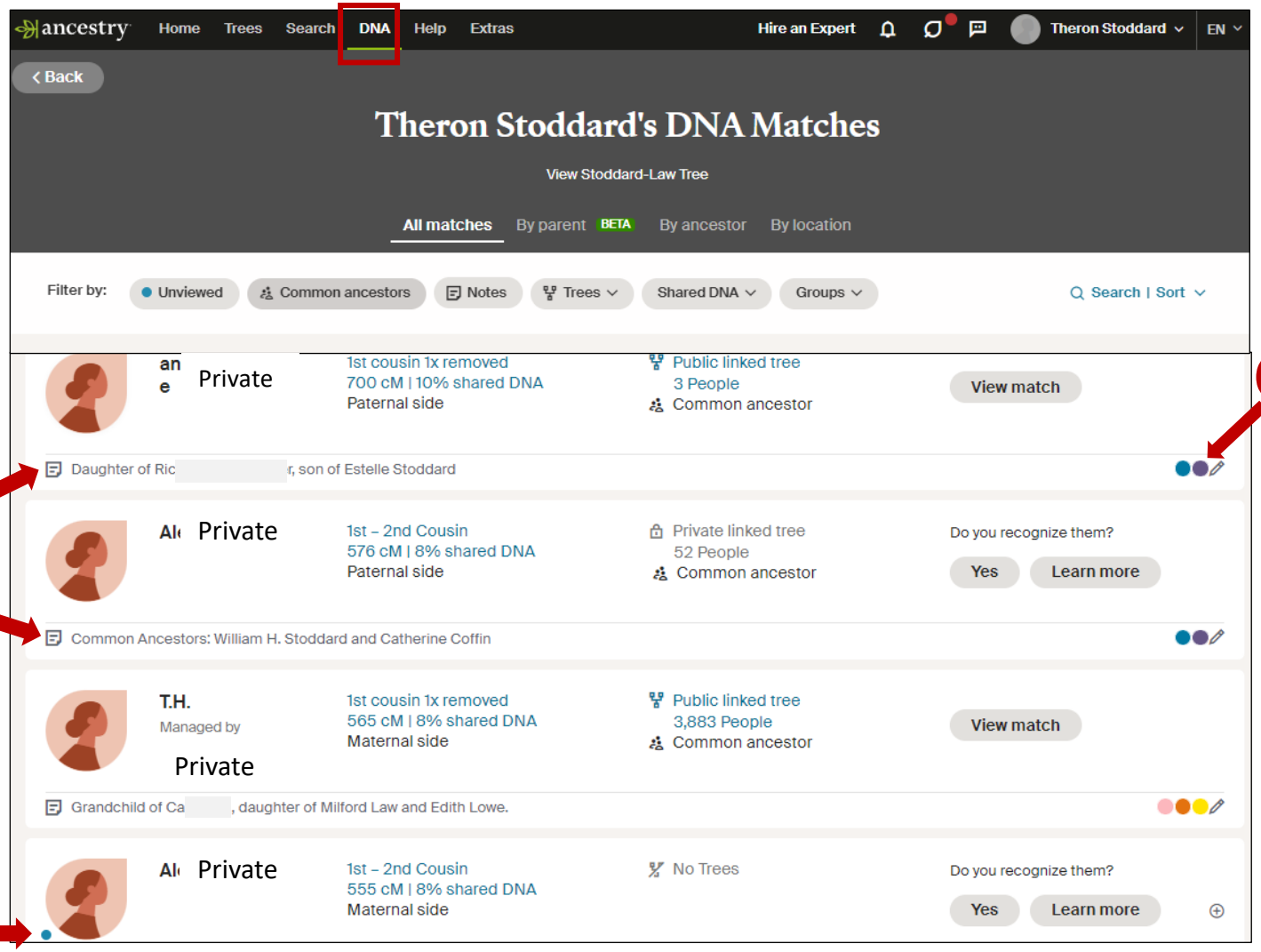
Your DNA Results

AncestryDNA Results Page



Your DNA Results

AncestryDNA Results Page



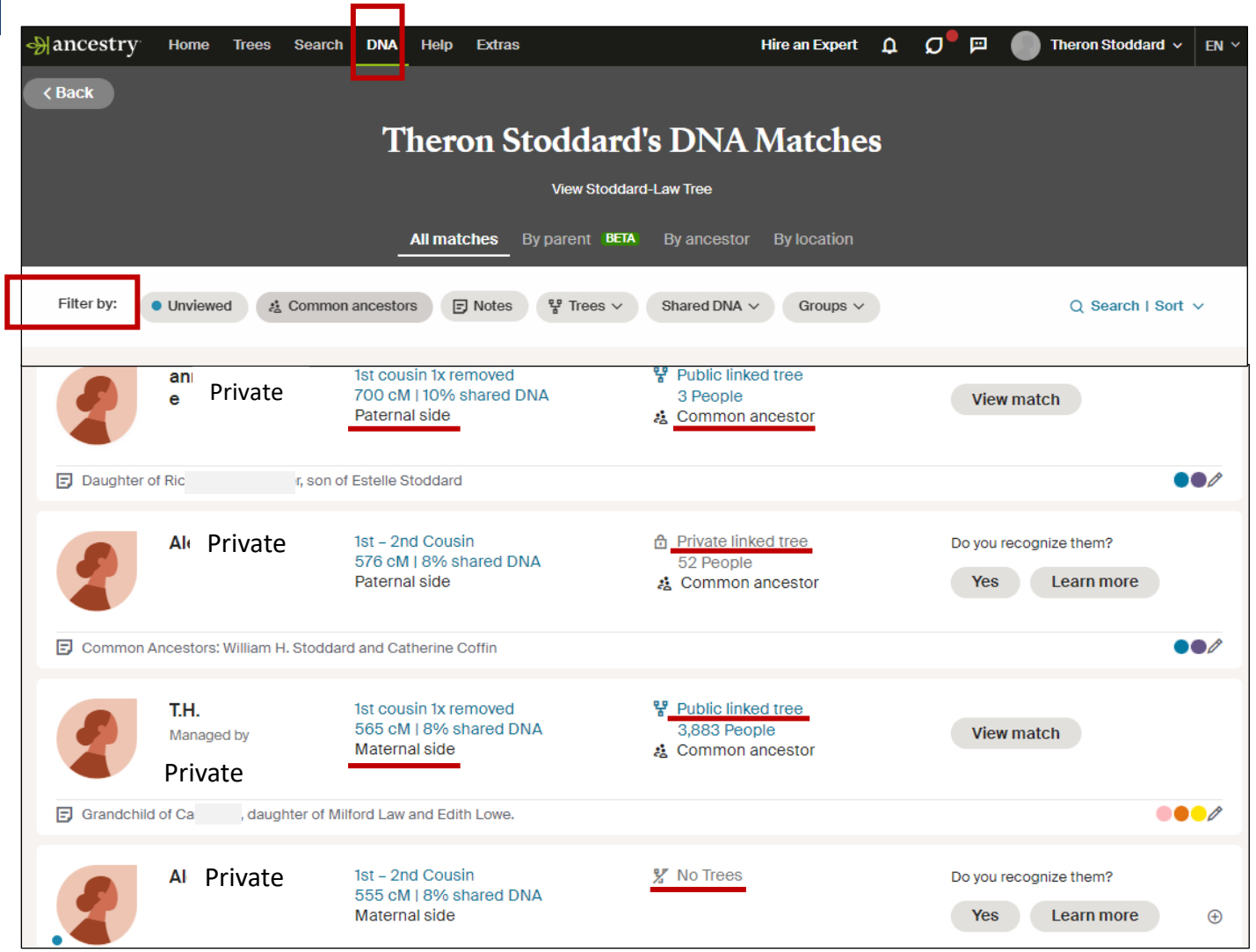
Groups

Notes

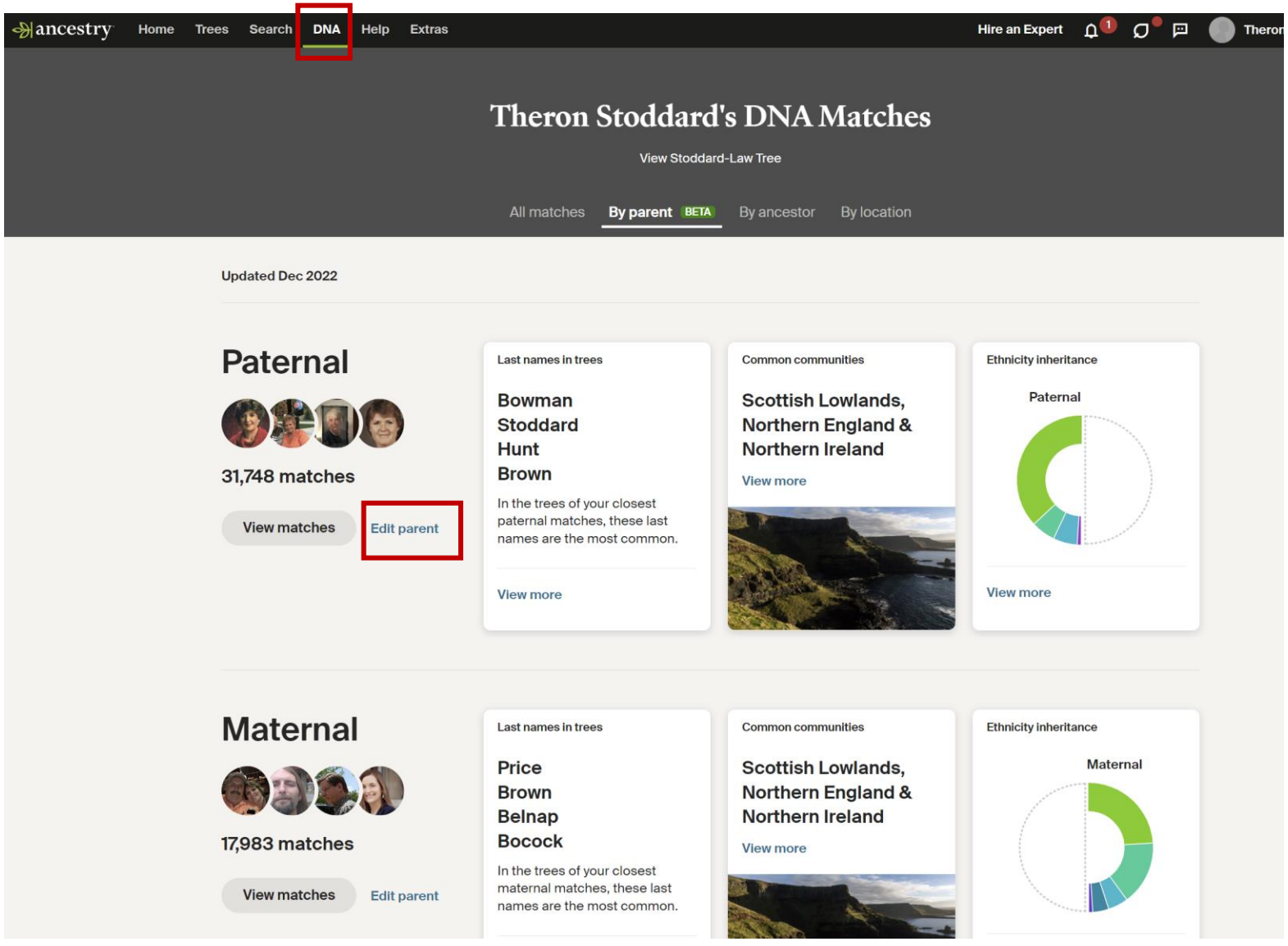
"Not Viewed" Dot

Your DNA Results

AncestryDNA Results Page



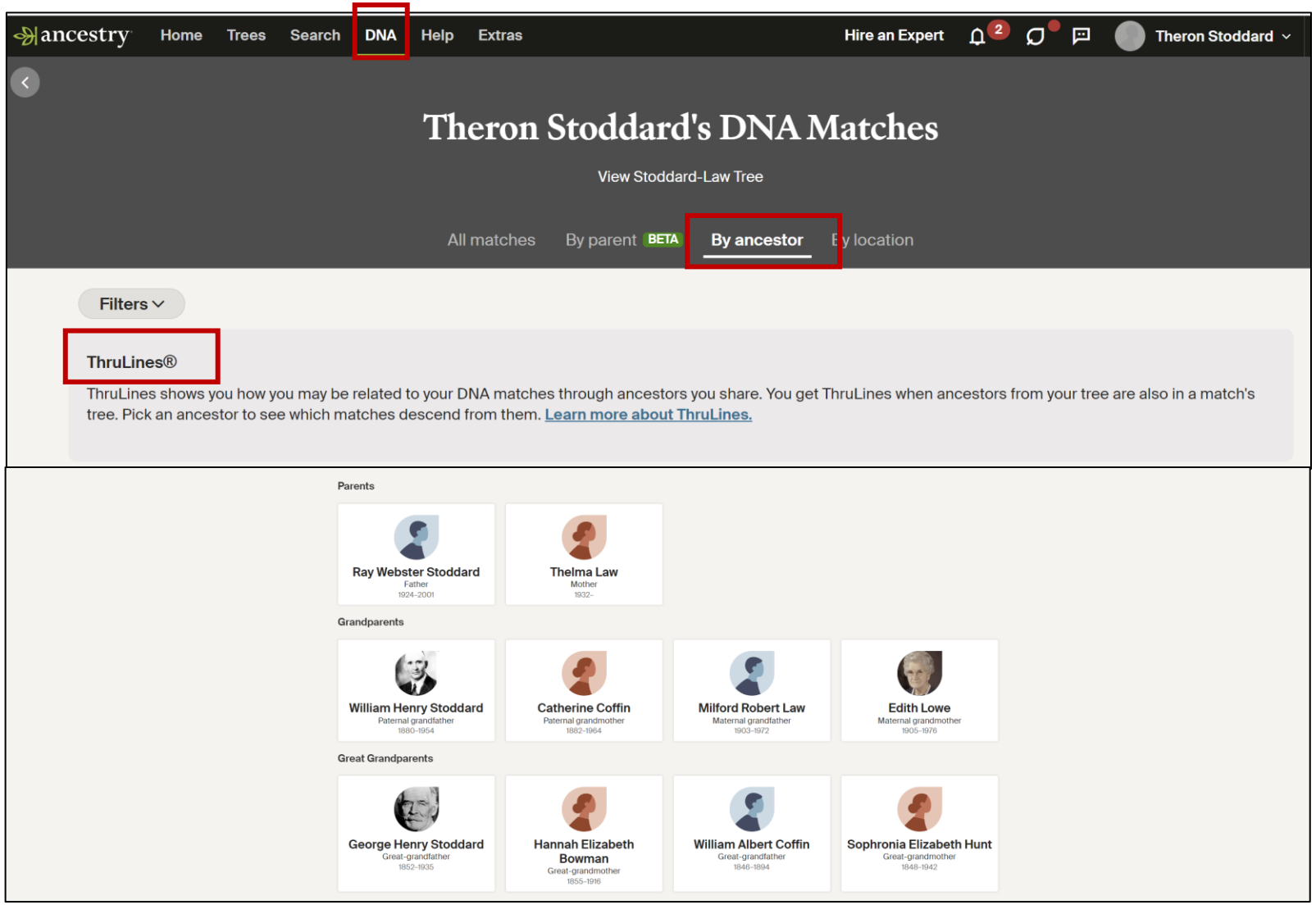
Filtering DNA Matches



Filtering DNA Matches

The “By Ancestor” filter displays Ancestry’s ThruLines tool, which predicts how you and a DNA match are related based on Ancestry Public Member Trees.

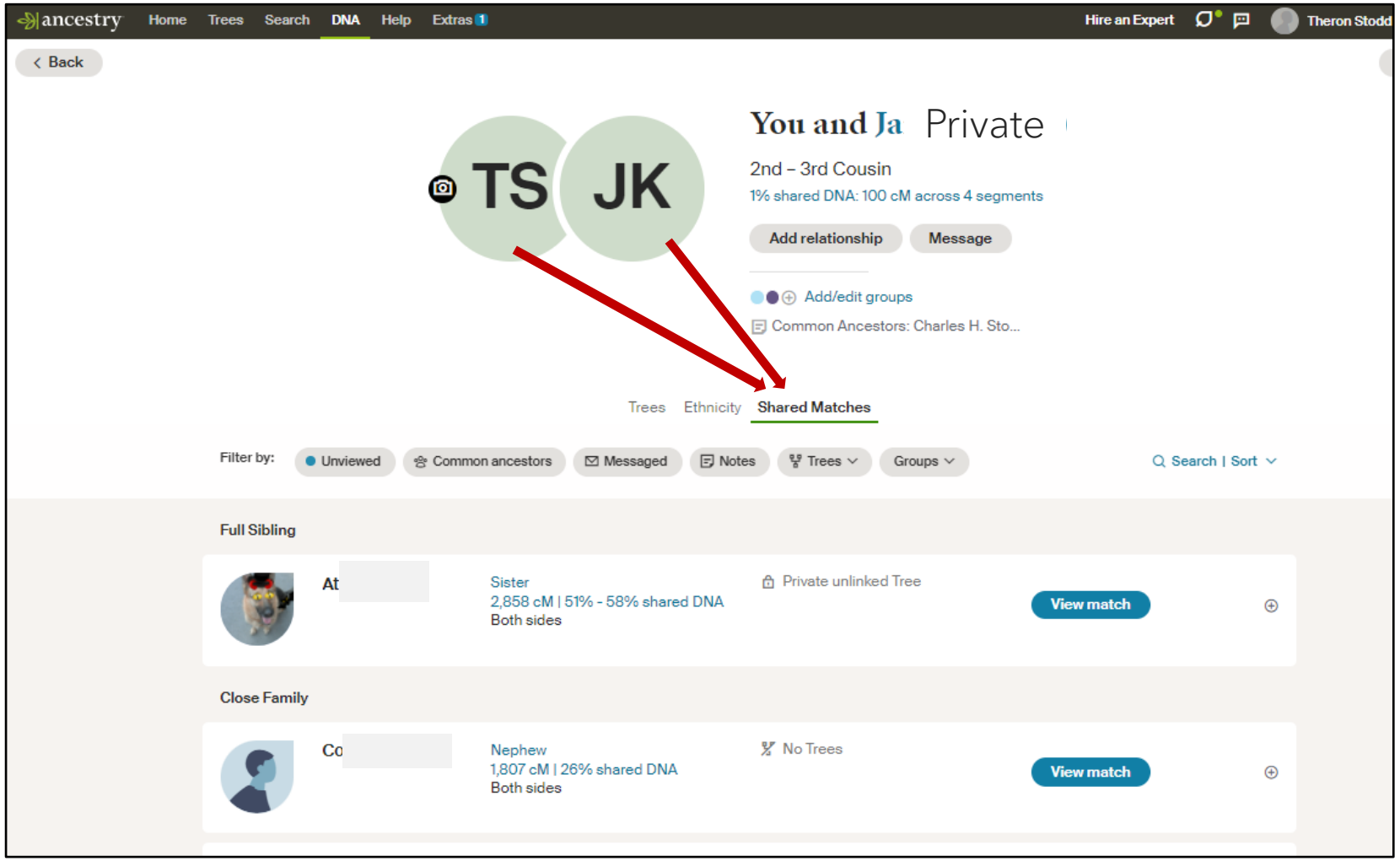
This means you need to verify everything!



DNA Match Page: Shared Match List

Clicking on the Shared Match tab shows the list of matches that TS (Theron) and JK have in common.

This is referred to as match triangulation.

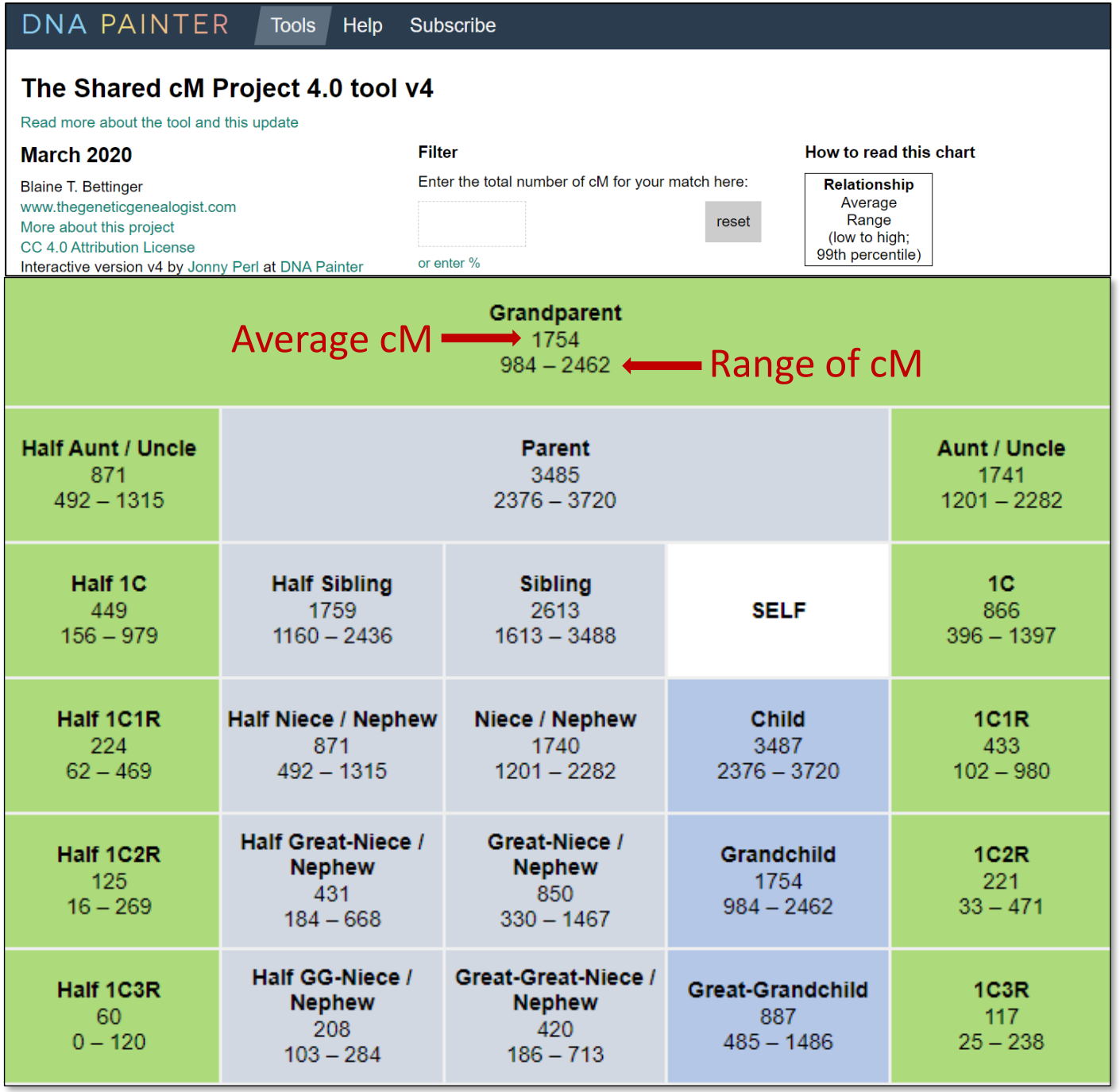


DNA Evidence

Principle #1:

The more cM a person shares with a DNA match, the closer the relationship.

The Shared cM Project on DNA Painter shows possible relationships.



DNA PAINTER Tools Help Subscribe

The Shared cM Project 4.0 tool v4

Read more about the tool and this update

March 2020

Blaine T. Bettinger
www.thegeneticgenealogist.com
More about this project
CC 4.0 Attribution License
Interactive version v4 by Jonny Perl at DNA Painter

Filter

Enter the total number of cM for your match here:

reset

or enter %

How to read this chart

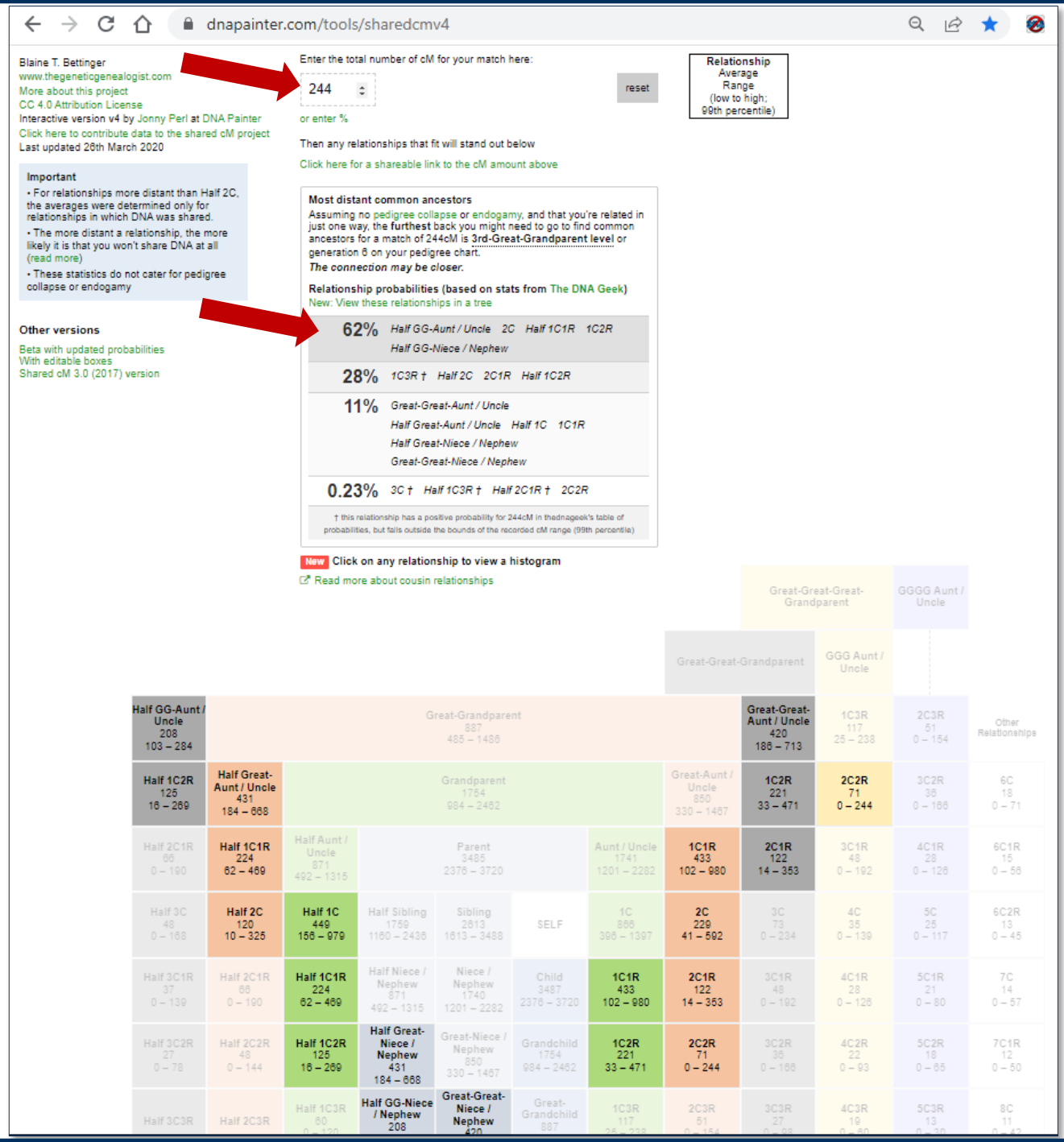
Relationship
Average
Range
(low to high;
99th percentile)

Average cM → **Grandparent** 1754 (984 – 2462) ← Range of cM

Half Aunt / Uncle 871 492 – 1315	**Parent** 3485 2376 – 3720			**Aunt / Uncle** 1741 1201 – 2282
Half 1C 449 156 – 979	**Half Sibling** 1759 1160 – 2436	**Sibling** 2613 1613 – 3488	**SELF**	**1C** 866 396 – 1397
Half 1C1R 224 62 – 469	**Half Niece / Nephew** 871 492 – 1315	**Niece / Nephew** 1740 1201 – 2282	**Child** 3487 2376 – 3720	**1C1R** 433 102 – 980
Half 1C2R 125 16 – 269	**Half Great-Niece / Nephew** 431 184 – 668	**Great-Niece / Nephew** 850 330 – 1467	**Grandchild** 1754 984 – 2462	**1C2R** 221 33 – 471
Half 1C3R 60 0 – 120	**Half GG-Niece / Nephew** 208 103 – 284	**Great-Great-Niece / Nephew** 420 186 – 713	**Great-Grandchild** 887 485 – 1486	**1C3R** 117 25 – 238

DNA Evidence

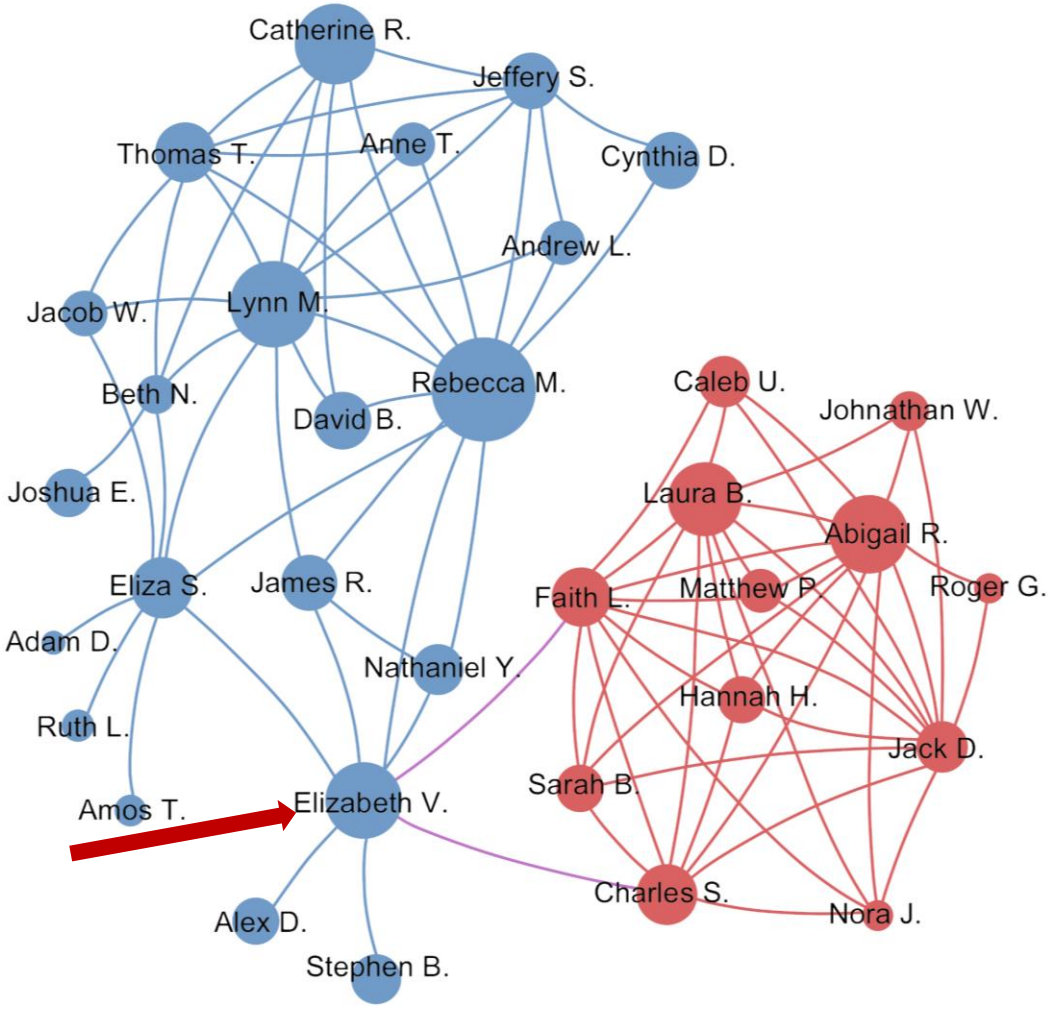
Enter the number of cM you share with a match to highlight possible relationships.



How DNA provides genealogical evidence

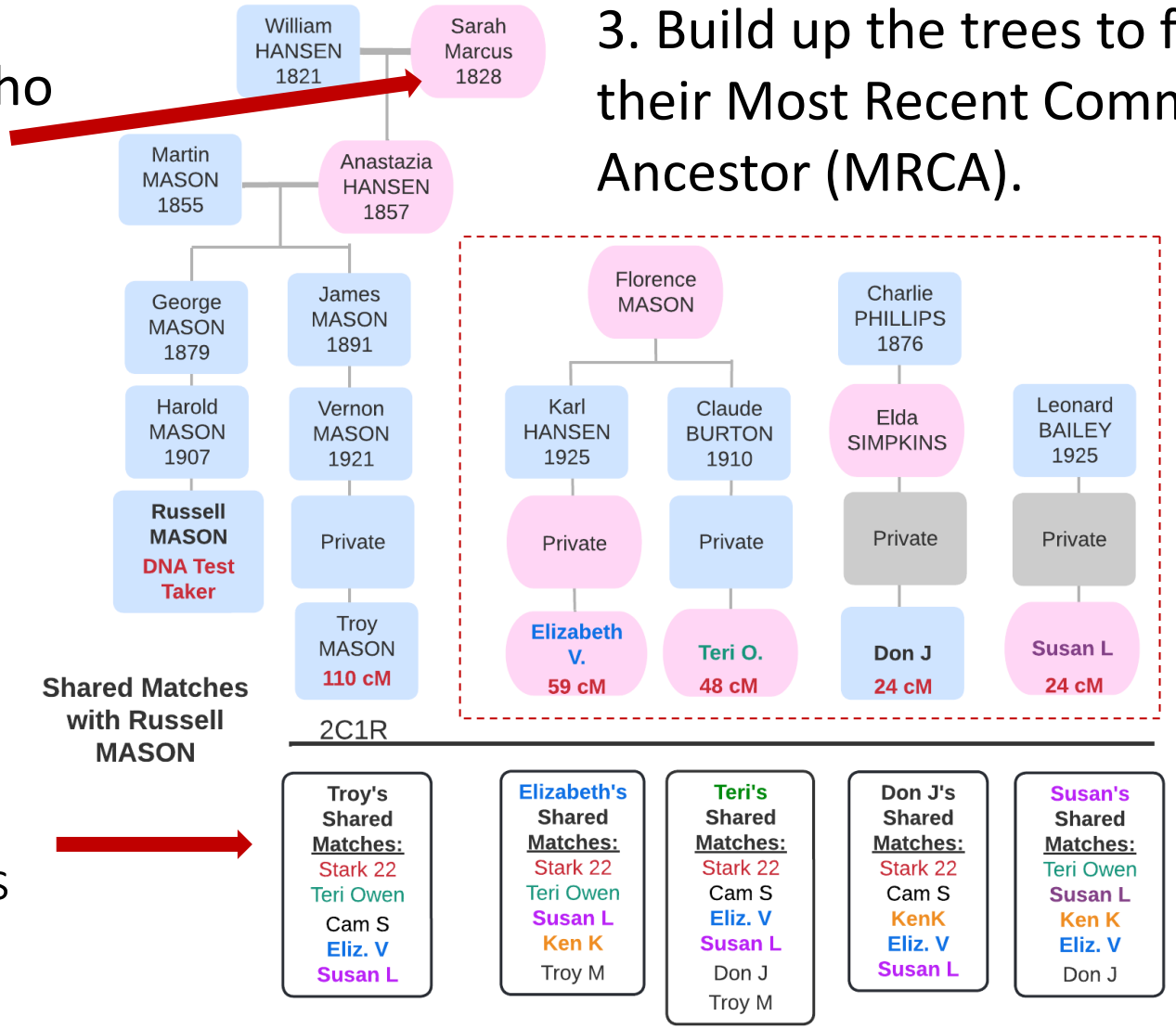
Principle #2:
A shared match group is also called a genetic network. They share a Most Recent Common Ancestor (MRCA).

The larger the genetic network, the stronger the evidence.



Evidence: DNA Shared Match Groups

1. Research Question: Who are Sarah's Parents?

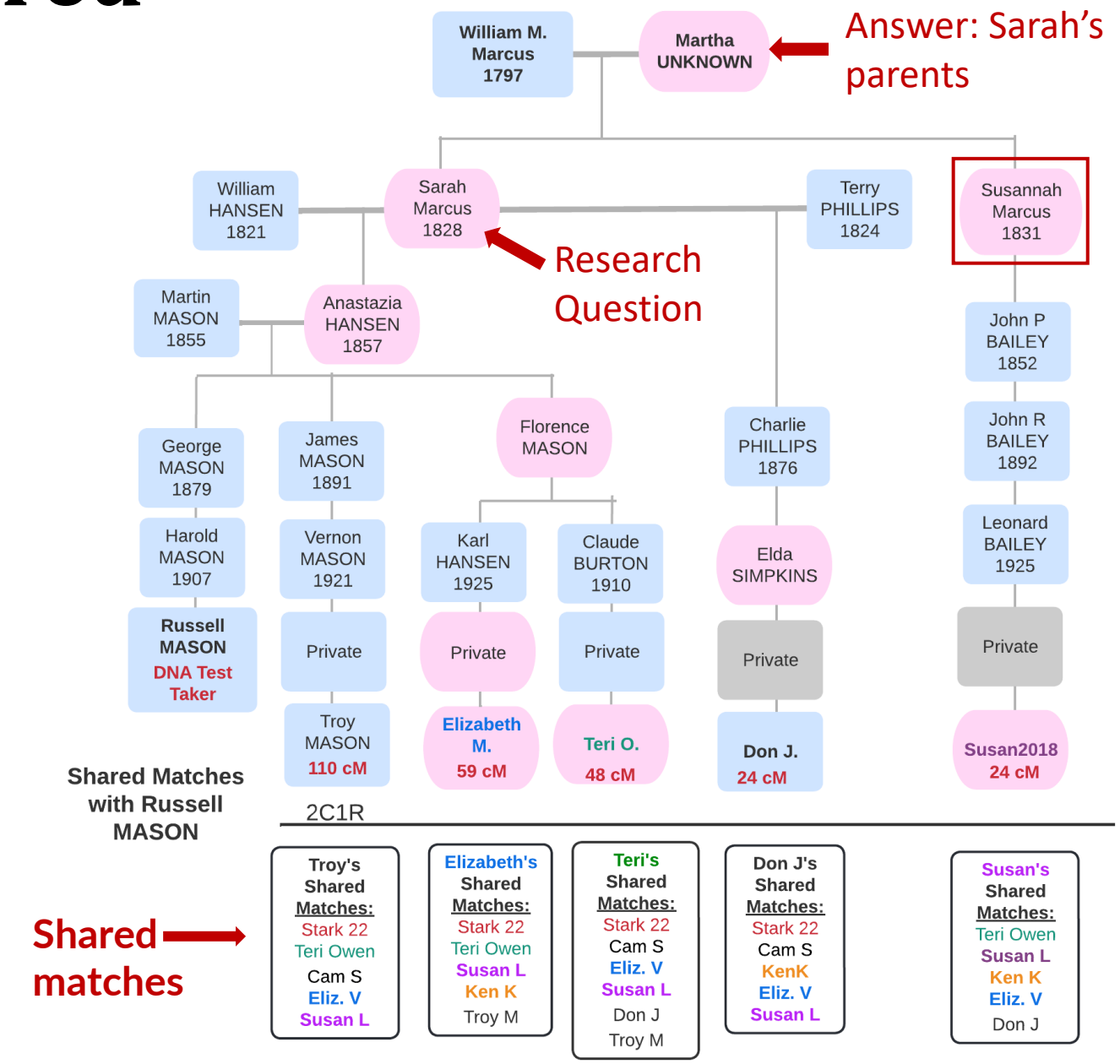


2. Create a Group of Shared DNA Matches

3. Build up the trees to find their Most Recent Common Ancestor (MRCA).

How to Use DNA Shared Match Groups

- All the Shared Matches descend from William and Martha Marcus.
- Documents found for Susannah Marcus named her parents.
- DNA can lead to more documents to research!



Organize DNA Matches into Shared Match Groups

Step 1

Create DNA Groups for Eight Great-Grandparents

Step 2

Create a DNA Focus Group for the Research Question

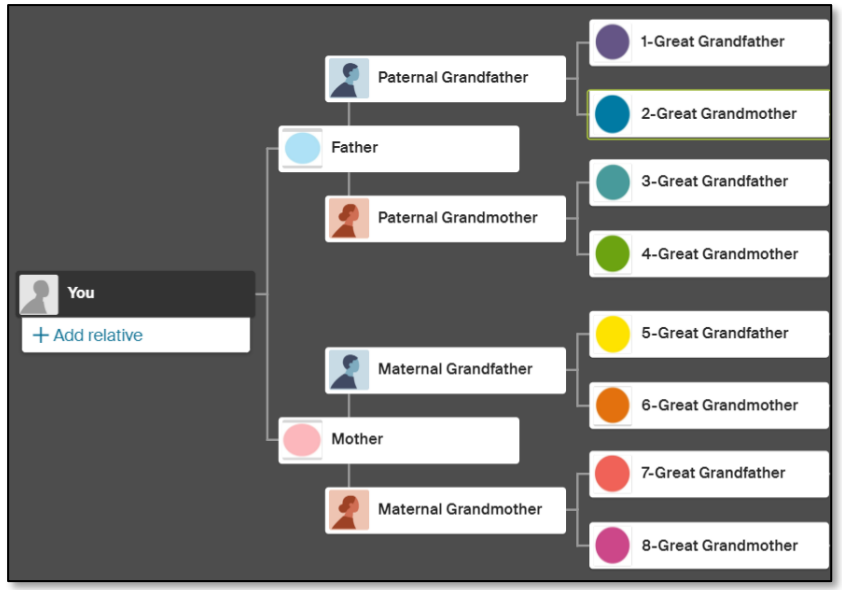
Step 3

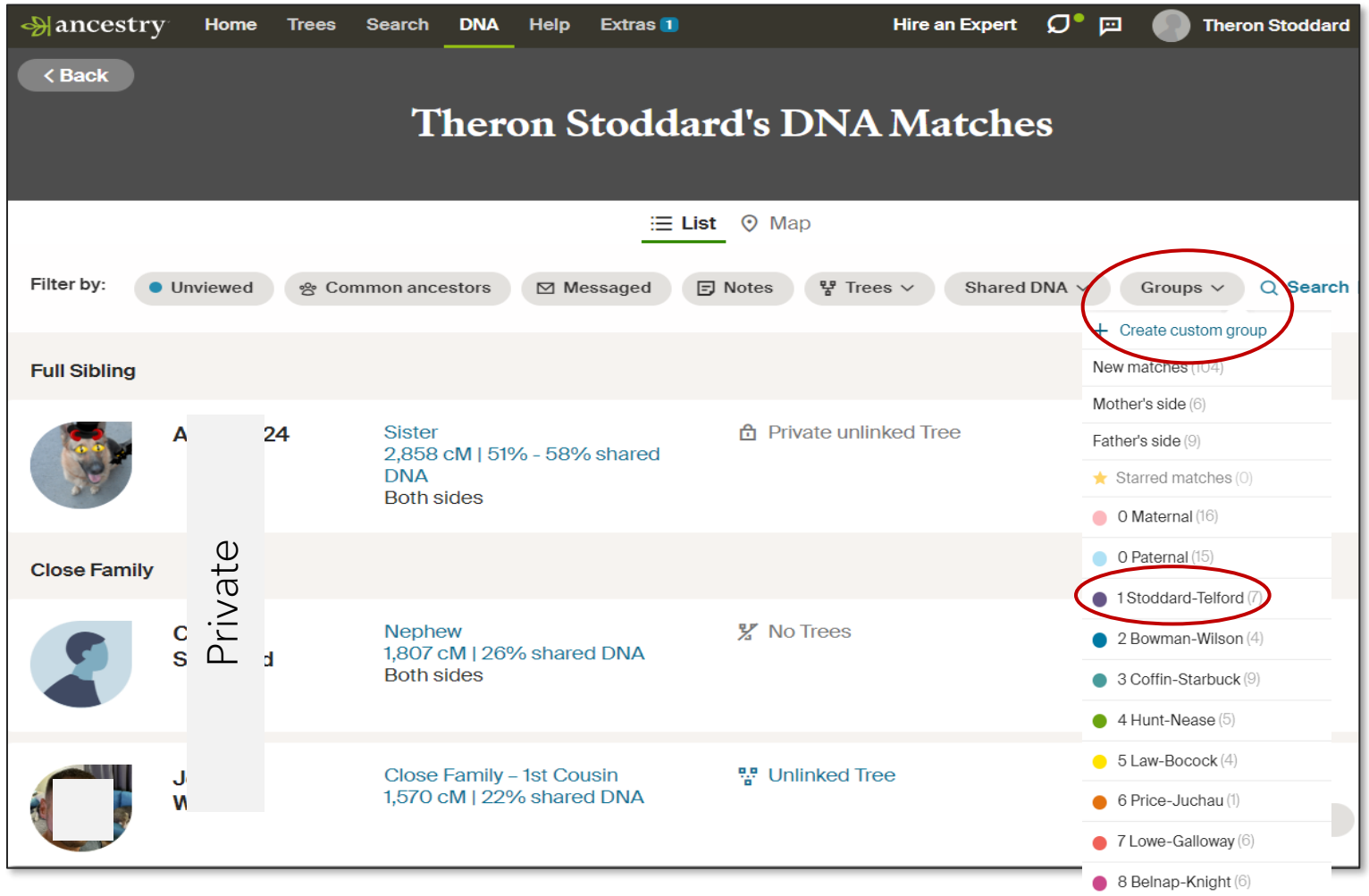
Place “Common Ancestor” & Known Matches into DNA Groups

Step 4

Build Up the DNA Focus Group for the Research Question

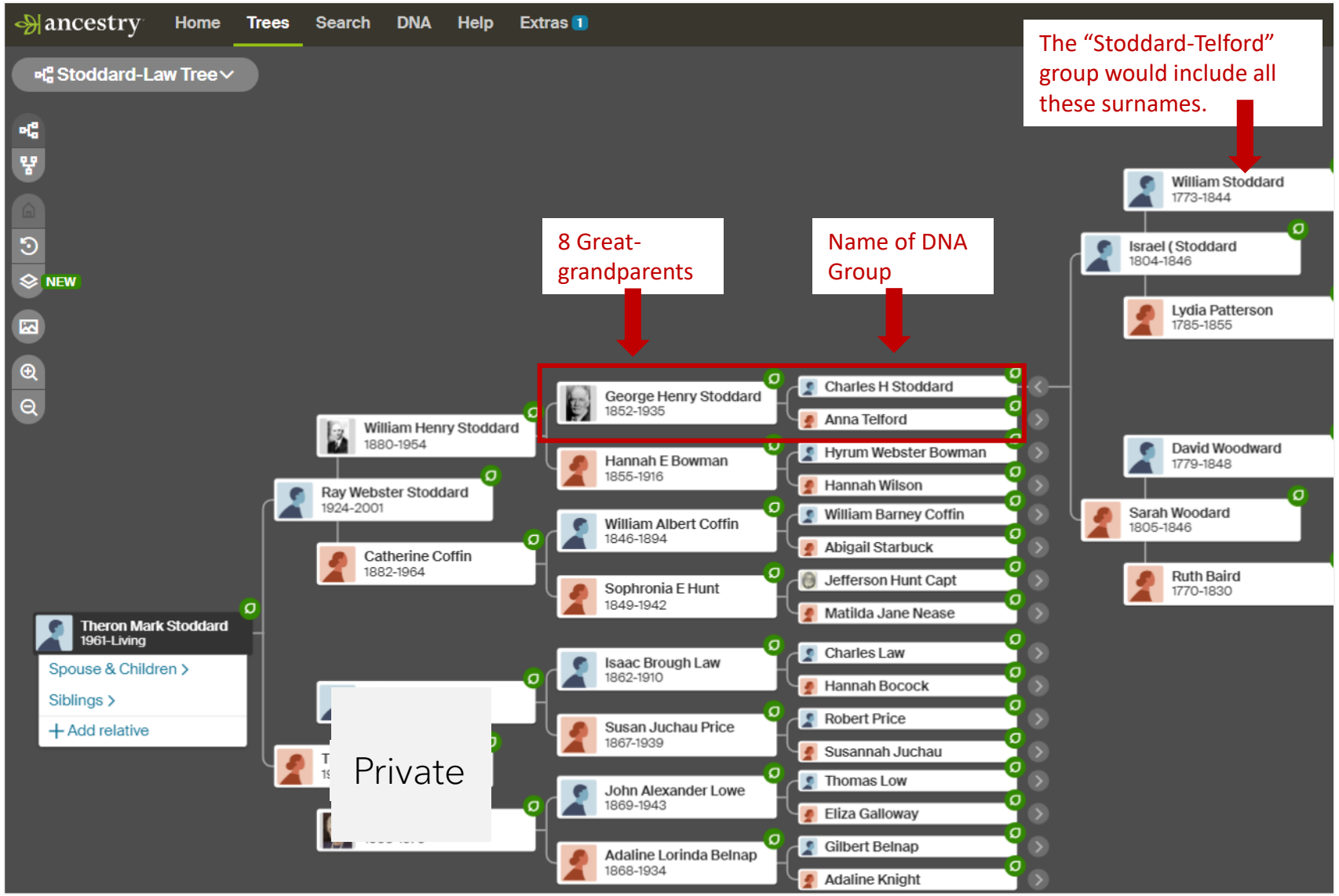
Create DNA groups for your eight great-grandparents to use as reference groups.





Use the surnames of the parents of your eight great-grandparents.

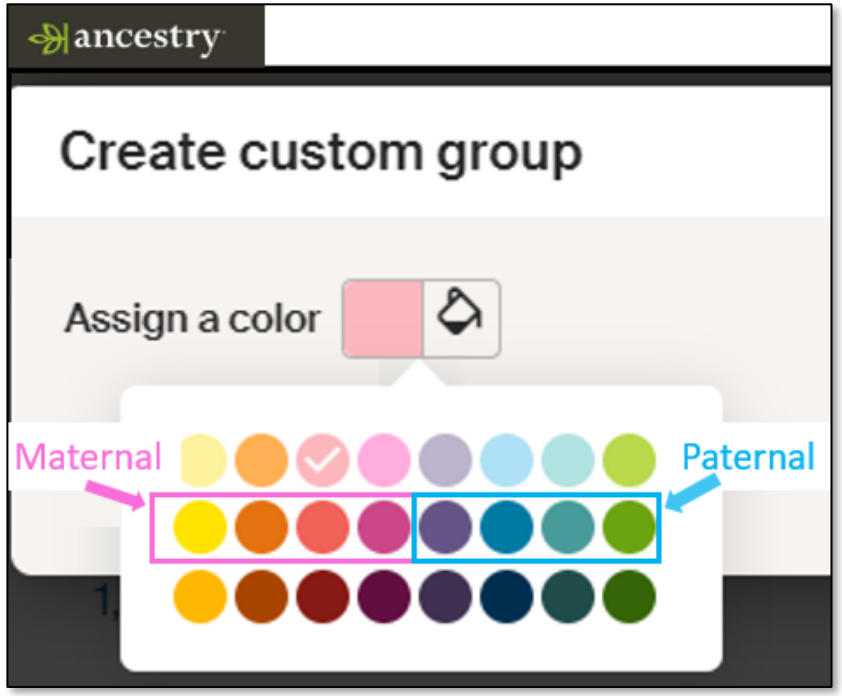
Example:
The DNA Group for George Henry Stoddard is "Stoddard-Telford" and it would include all surnames further back on this line.



Color-coding DNA Groups*

On Ancestry, the middle row has eight colors which are easy to distinguish.

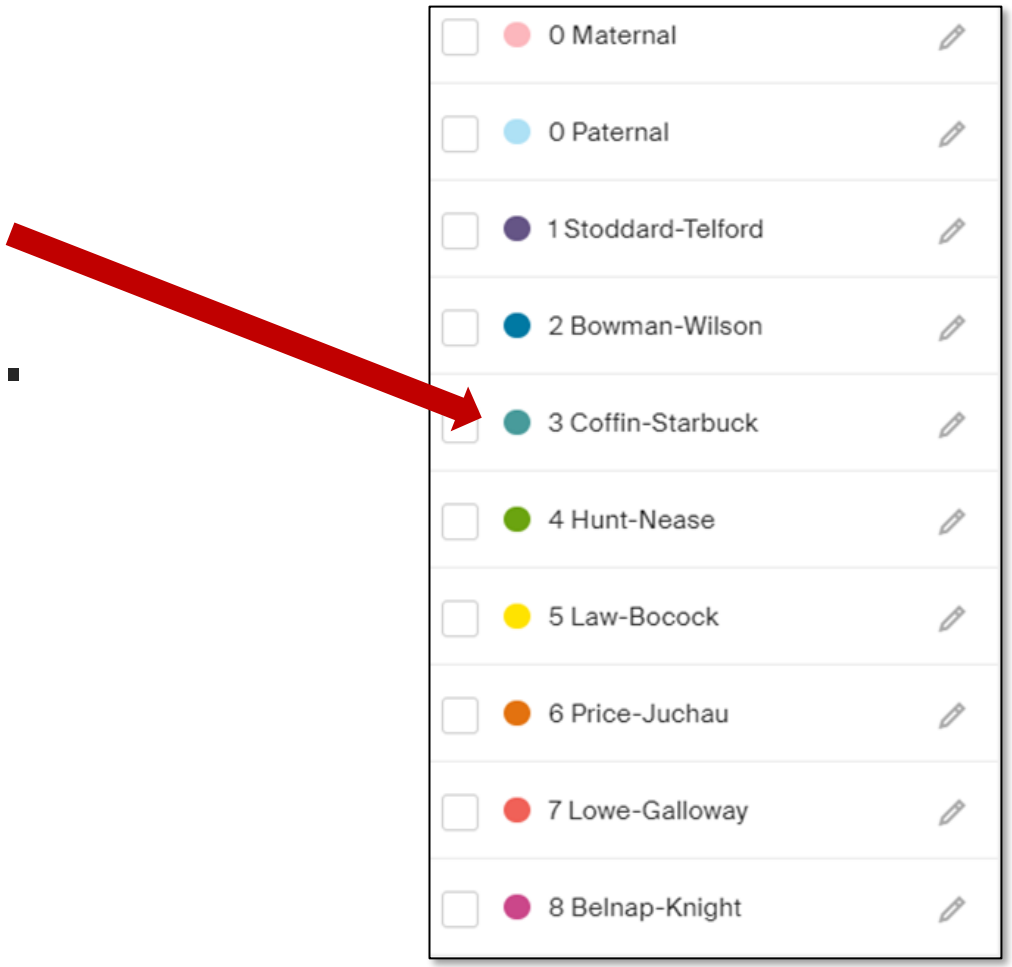
They work well for your eight great-grandparents.



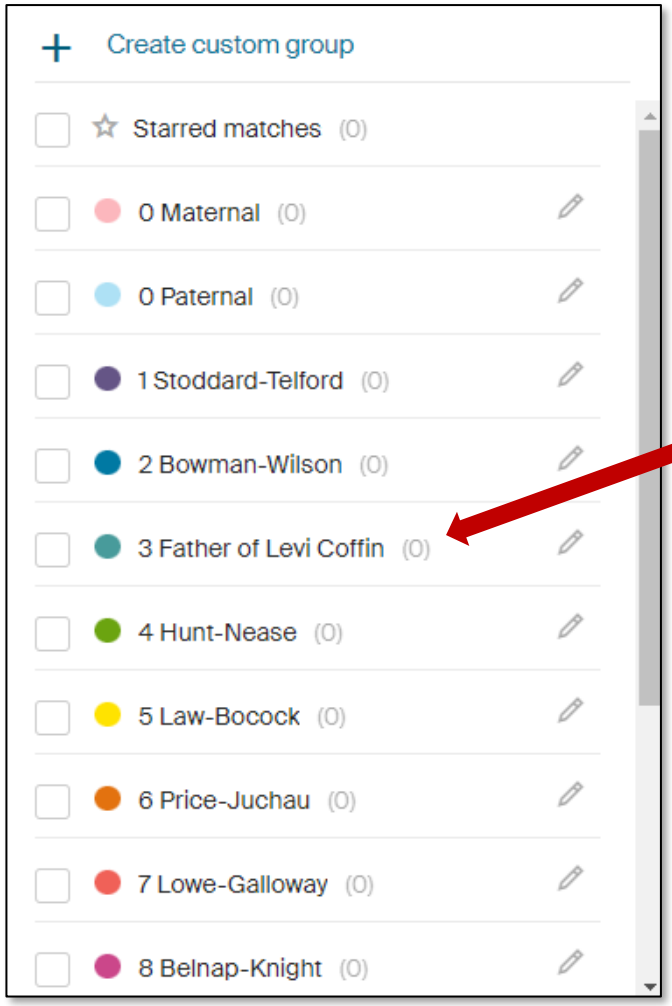
Use all colors on the left half for maternal lines and the right half for paternal lines.

Creating DNA Groups

Number your DNA groups to force the sort order you want.

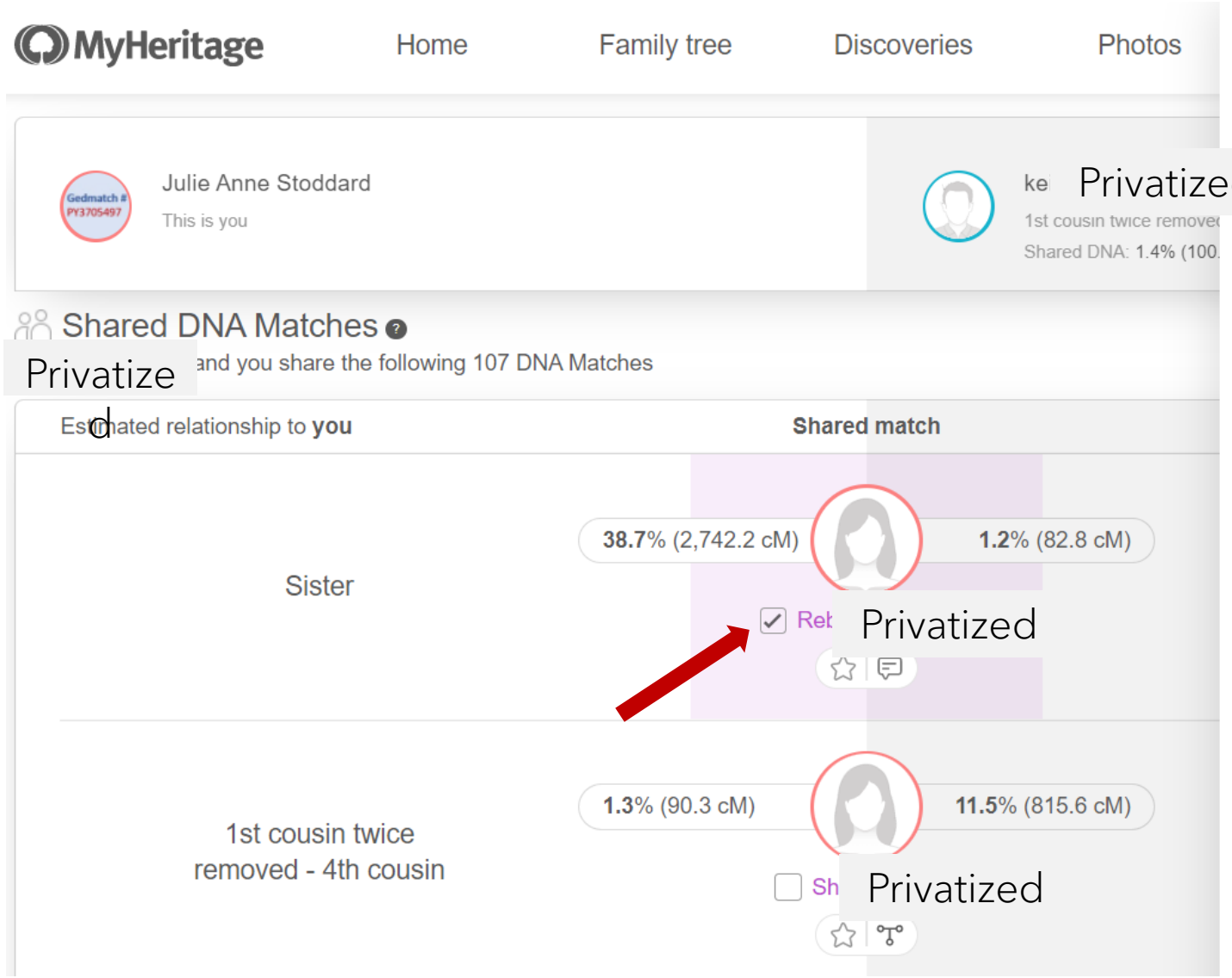


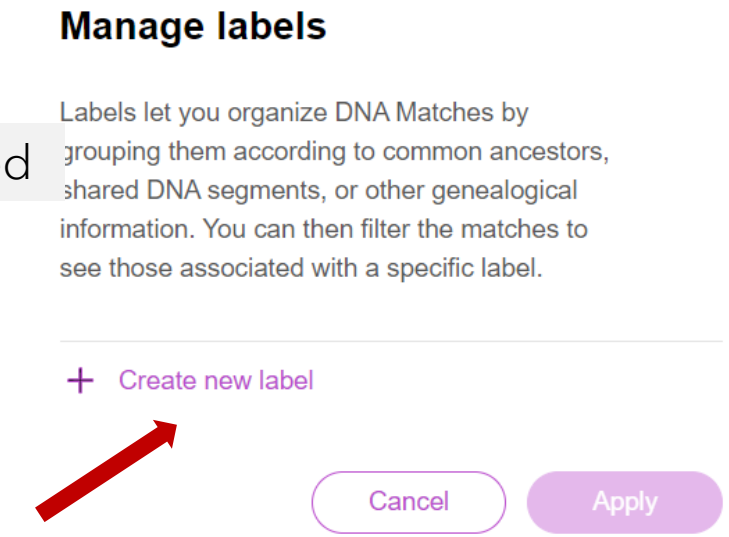
Creating DNA Groups



If a great-grandparent is unknown, label the group "Father/Mother of…"

Shared Match Groups on MyHeritage



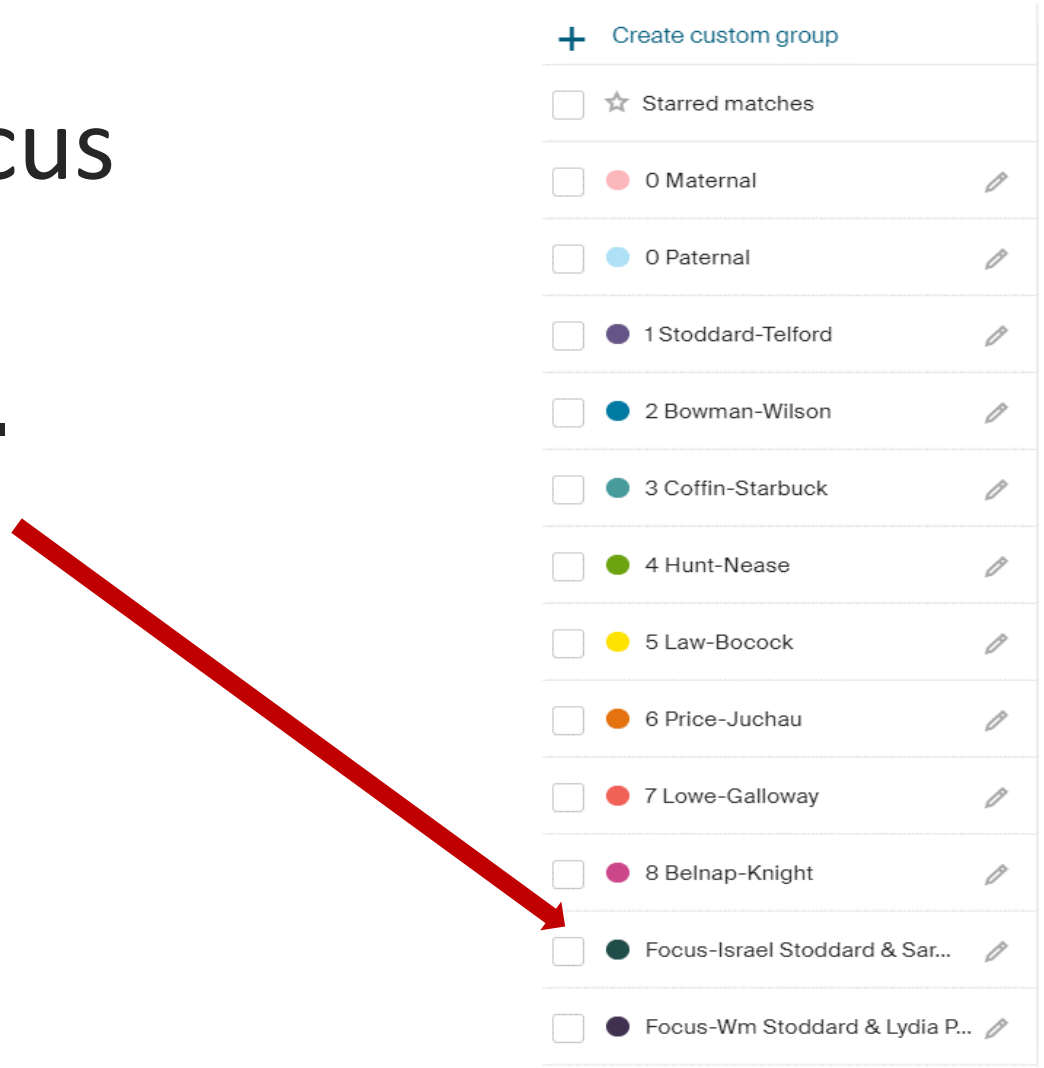


Organize DNA Matches into Shared Match Groups

Step 1	***Step 2***	***Step 3***	***Step 4***
Create DNA Groups for Eight Great-Grandparents	Create a DNA Focus Group for the Research Question	Place “Common Ancestor” & Known Matches into DNA Groups	Build Up the DNA Focus Group for the Research Question

DNA Focus Groups

Name the DNA focus group after your research question.



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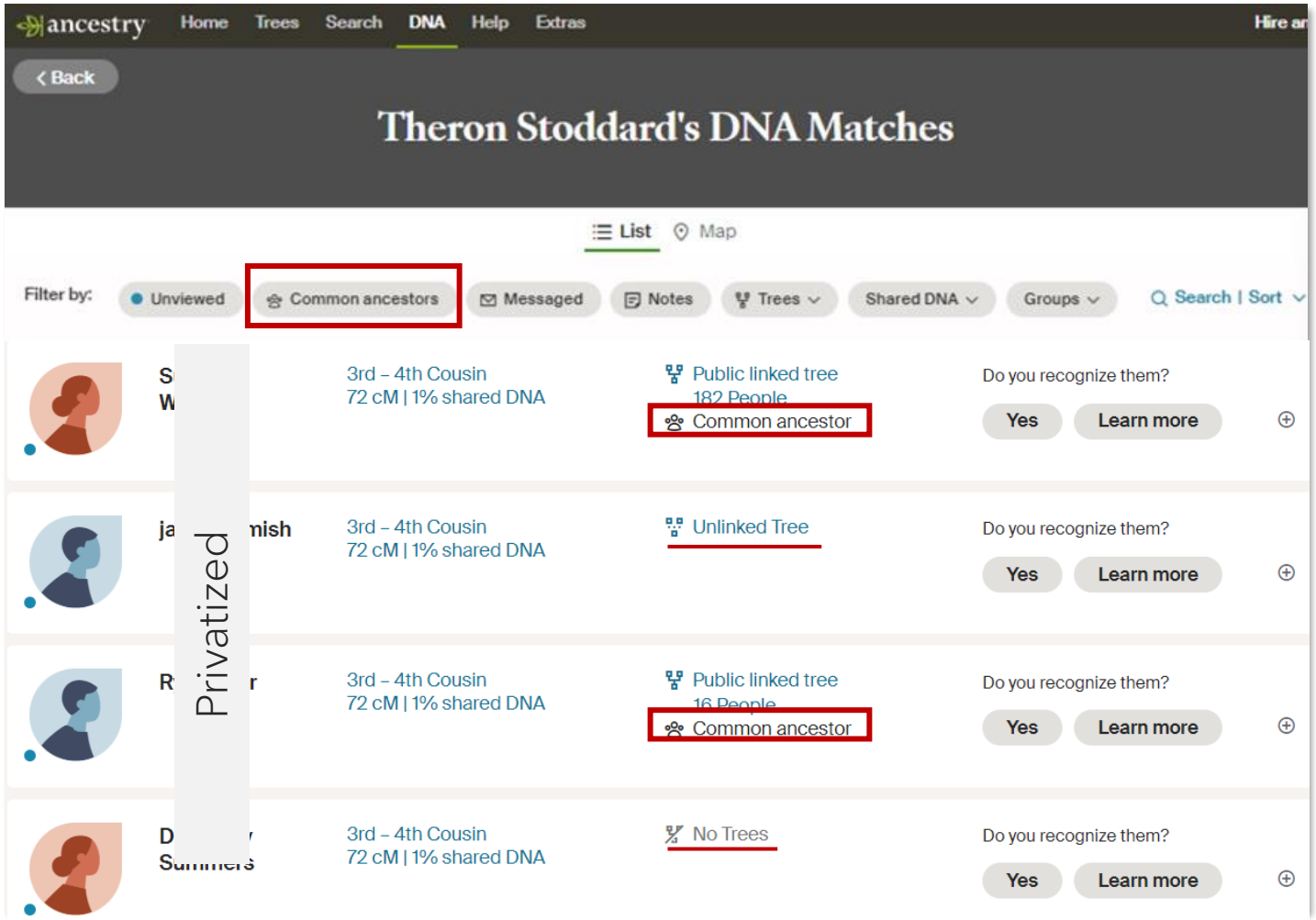
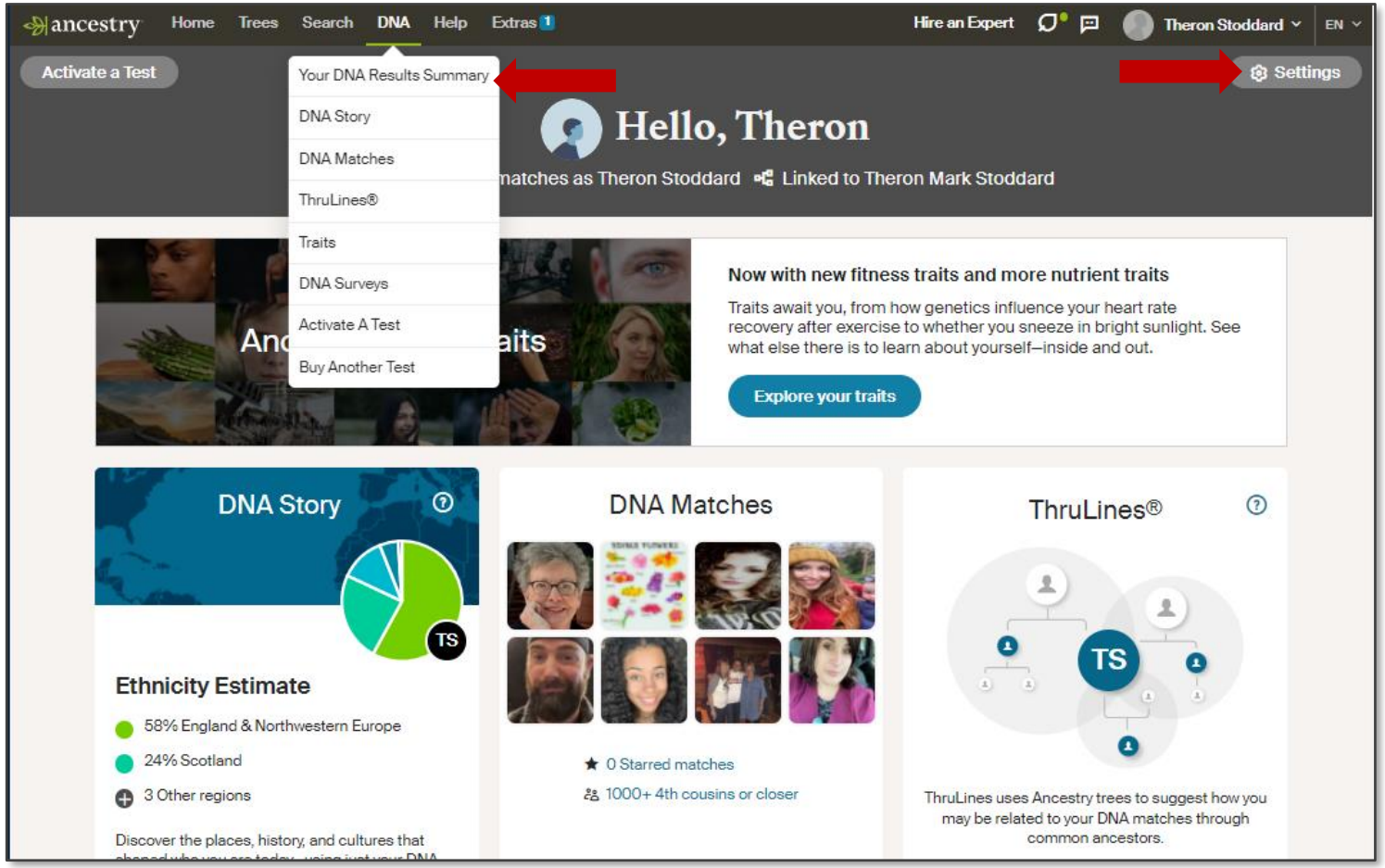
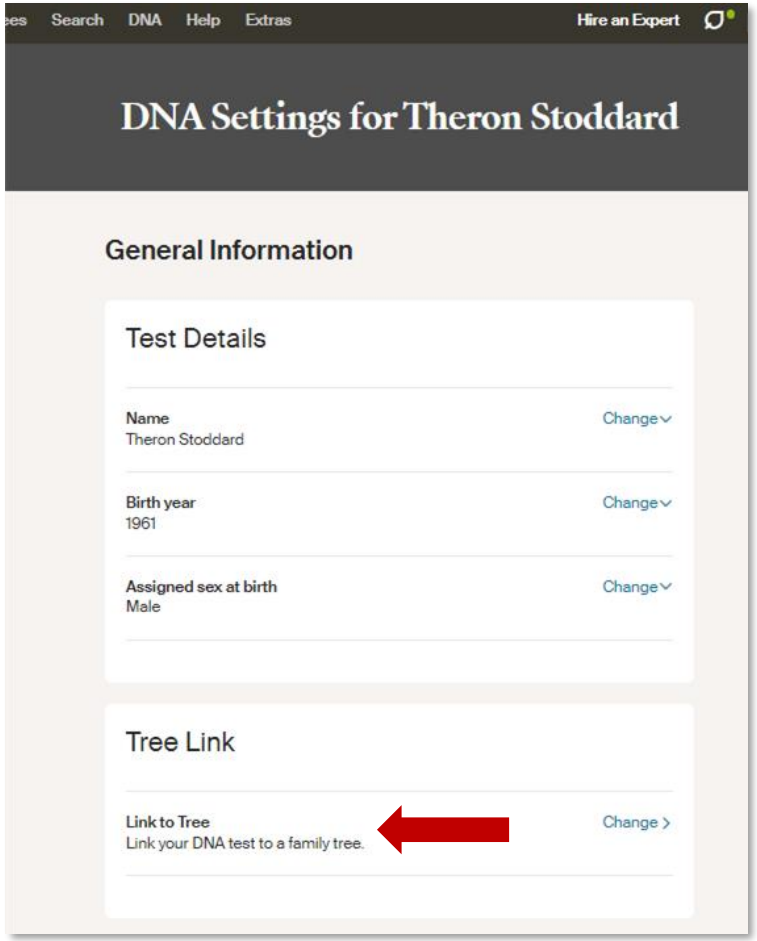
“Common Ancestor” Matches

- Your Common Ancestor matches become your reference group of known matches.
- Group ~50 DNA matches to research more recent ancestors.
- Group 100+ DNA matches for more distant ancestors.



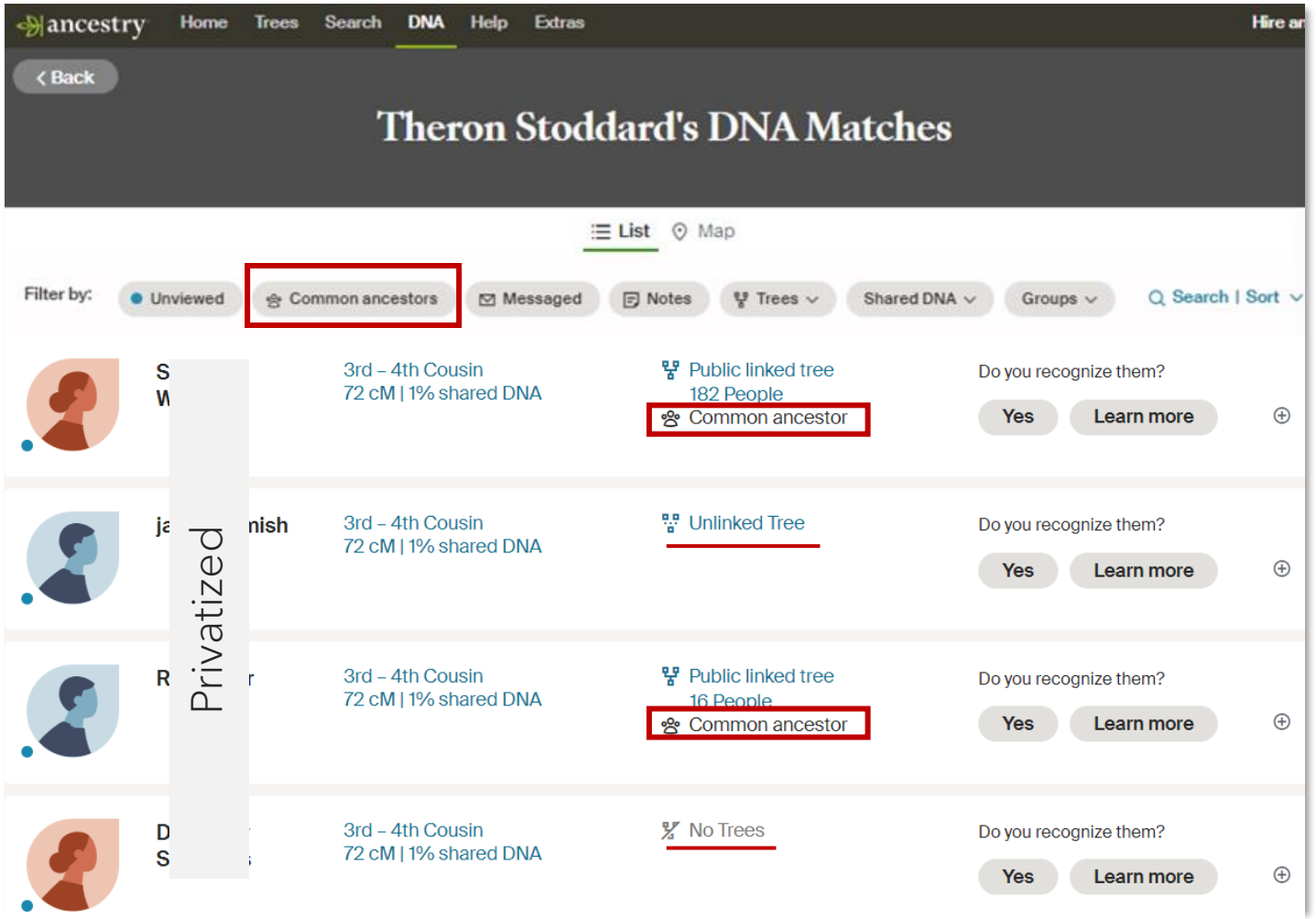
The Common Ancestor feature requires you to attach your DNA results to your family tree





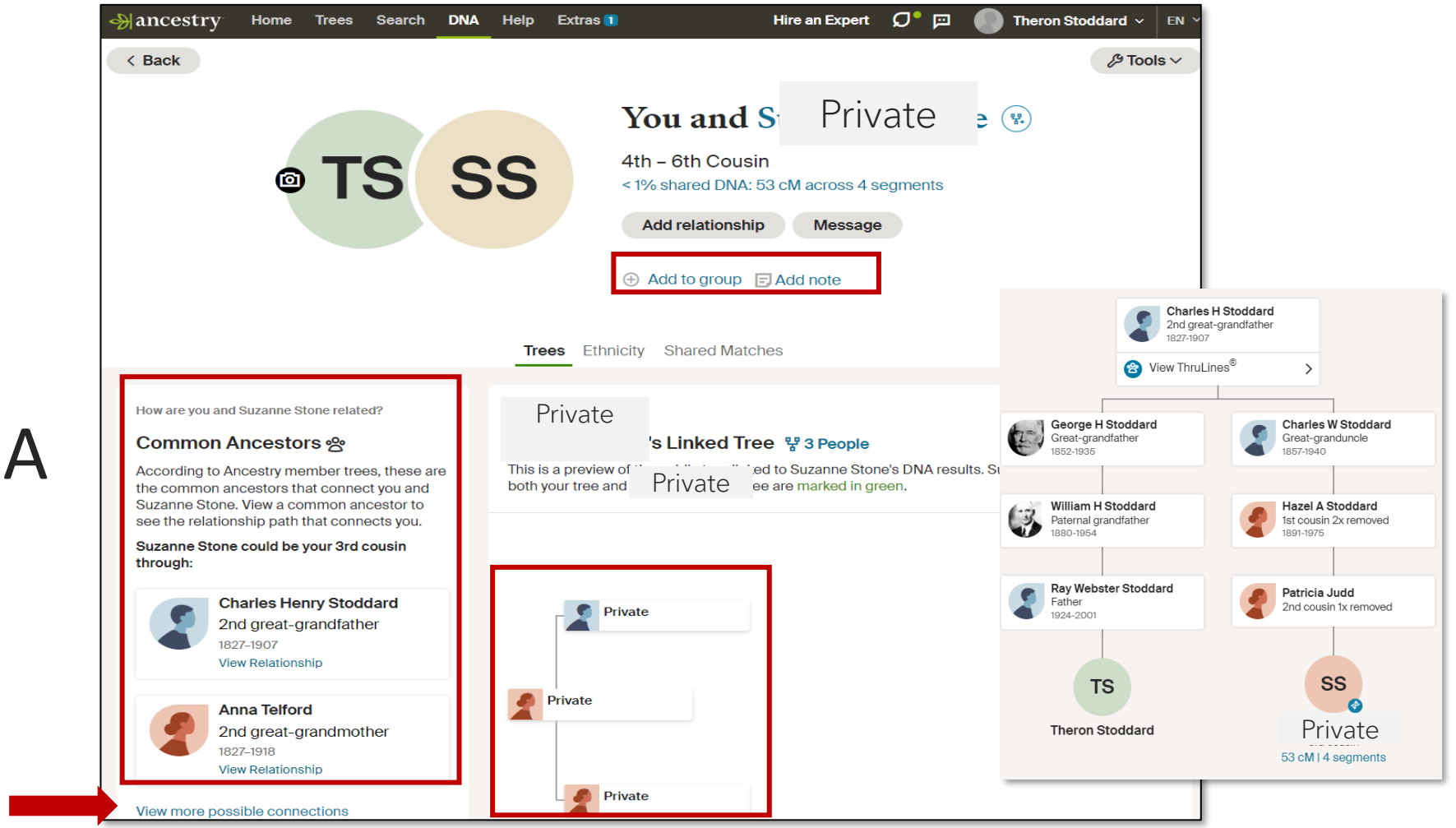
“Common Ancestor” Matches

Start with 2nd cousins and place the “Common Ancestor” matches into one of your DNA groups.

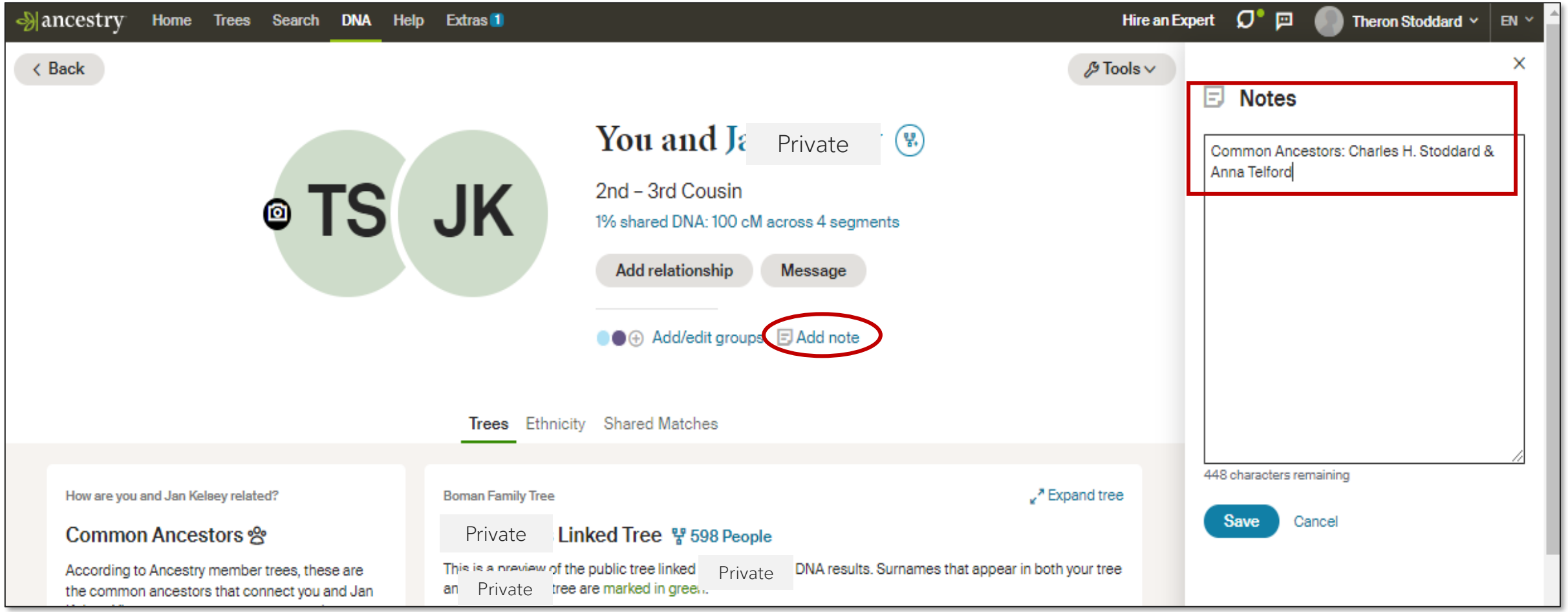


“Common Ancestor” Matches

Clicking on the “Common Ancestor” label takes you to the page for that DNA match.



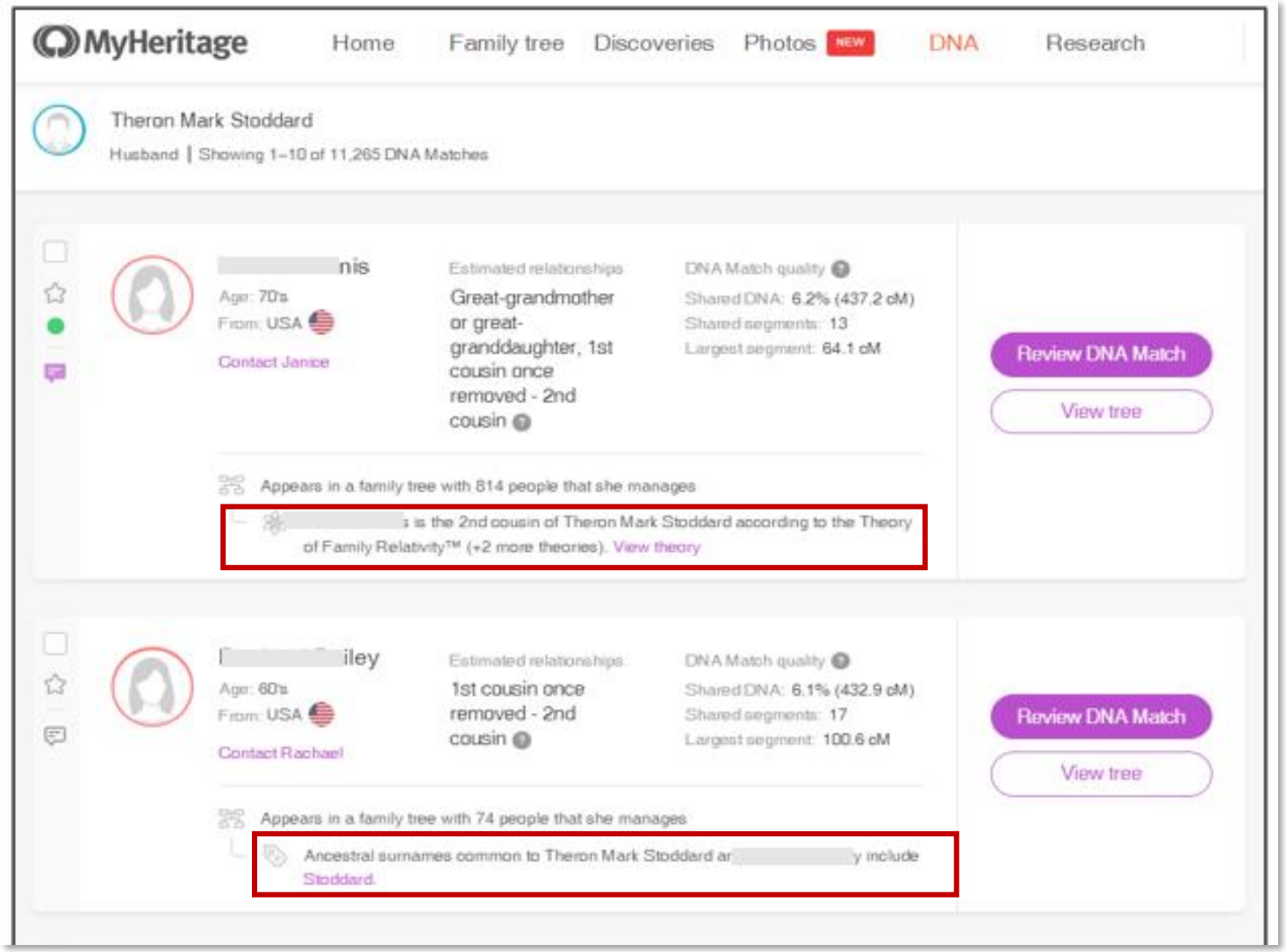
Add notes to each DNA match



MyHeritage

MyHeritage identifies available common ancestors in their "Theory of Family Relativity."

They also list common ancestral surnames you have with a DNA match.



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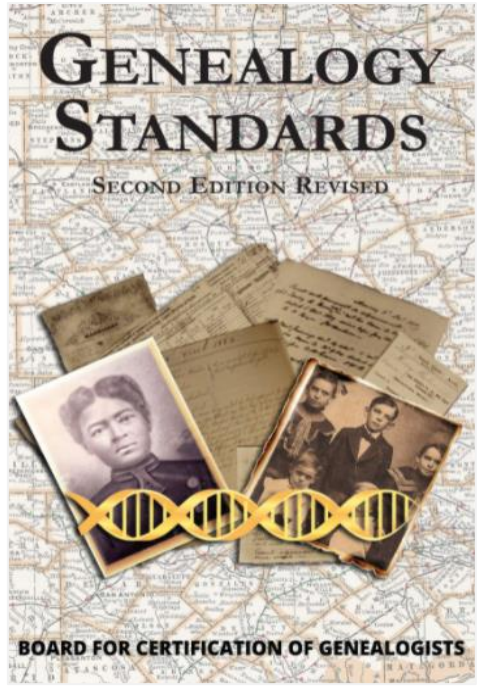
Genealogy Standards for DNA Evidence

1. Accuracy, completeness, and depth of each tree
2. The possibility of more than one common ancestor for each pair of DNA test takers
3. Reported and typical amounts of shared DNA
4. Thoroughness of relevant documentary research.

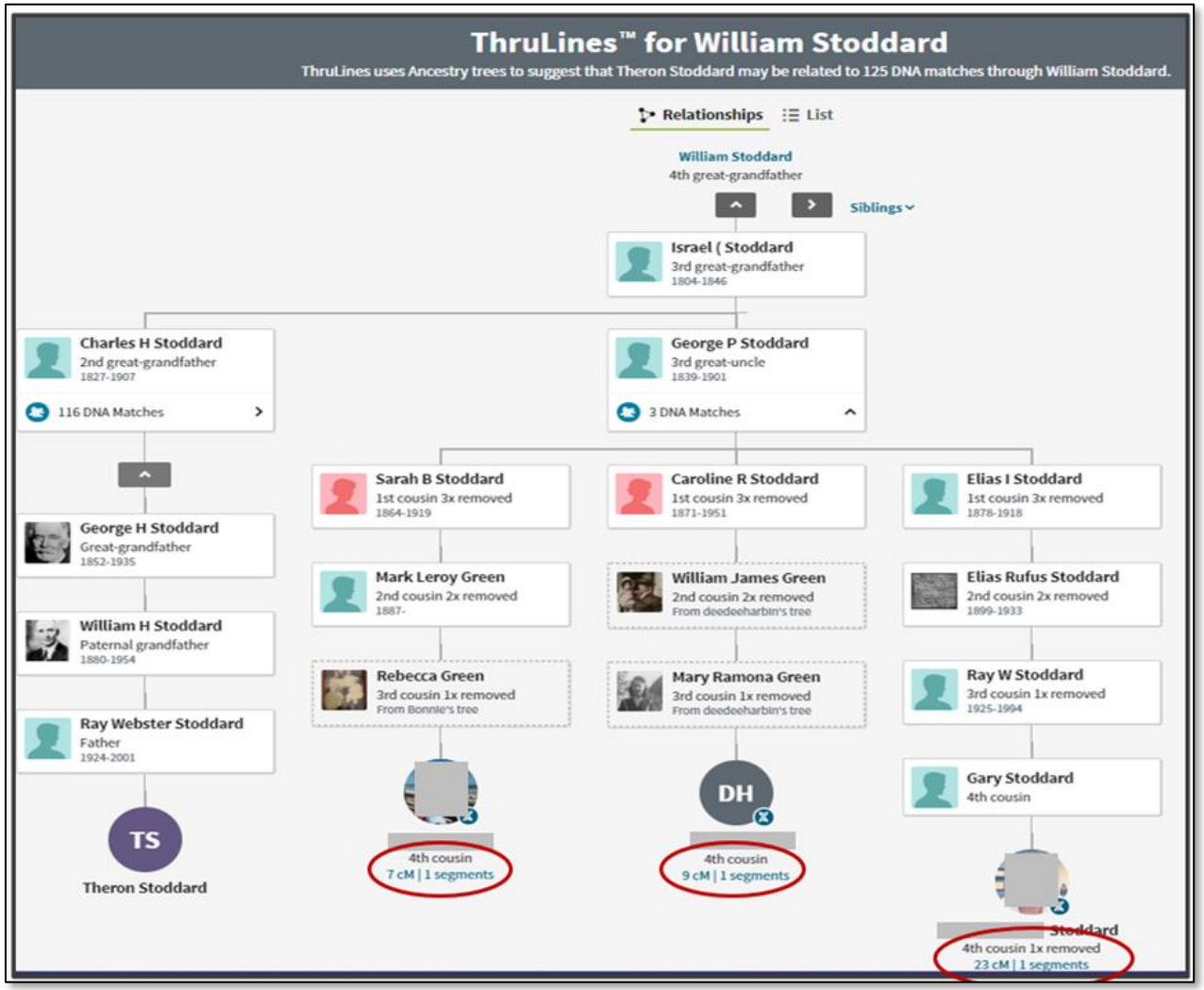


Board for Certification of Genealogists, *Genealogy Standards*, 2nd ed. (New York: Turner Publishing Company, 2019), 30.

The Danger of Small Segments

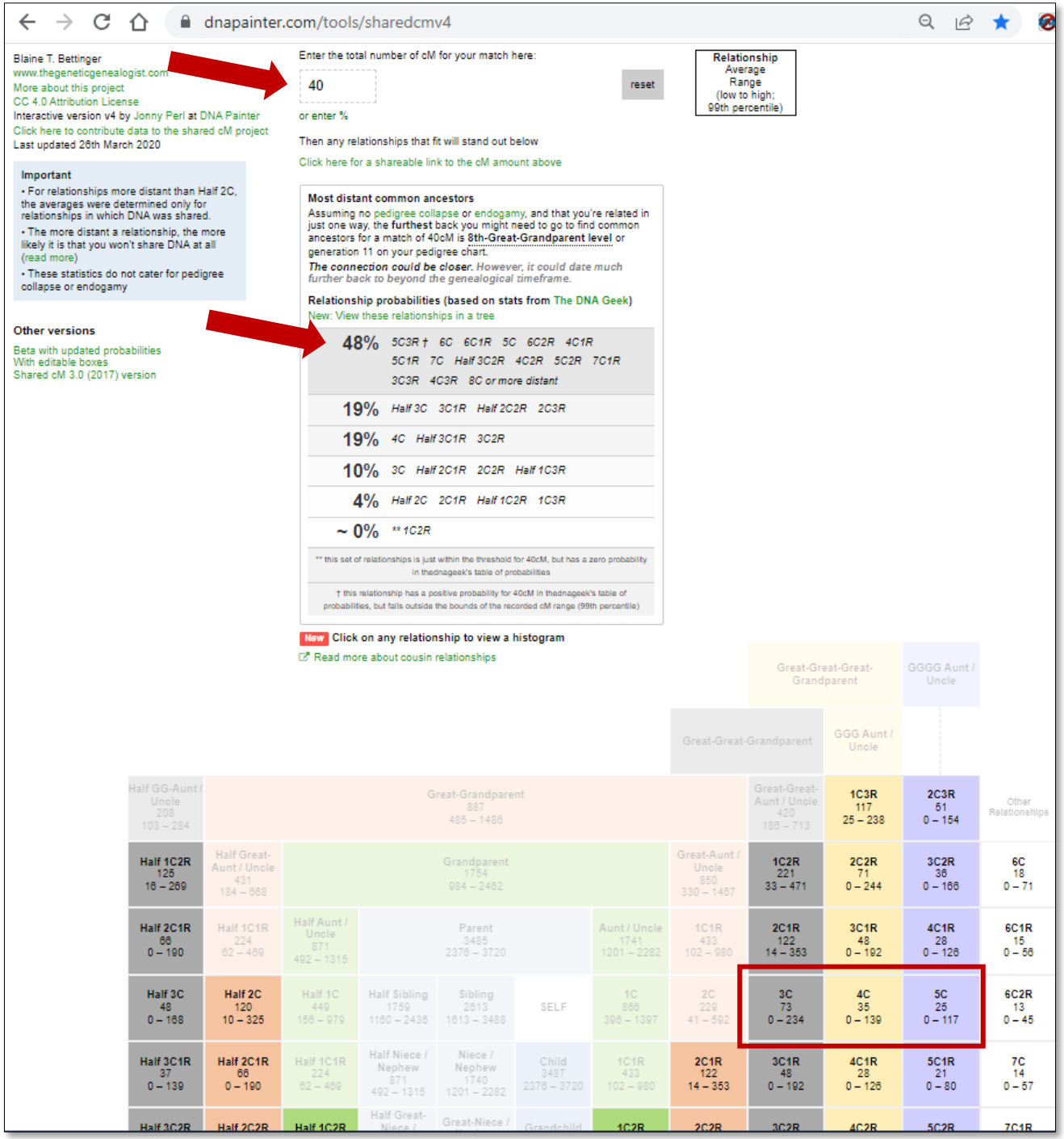
The further back in time you go, the smaller the DNA segments get.

Segments under 10-15 cM may be *false matches*.

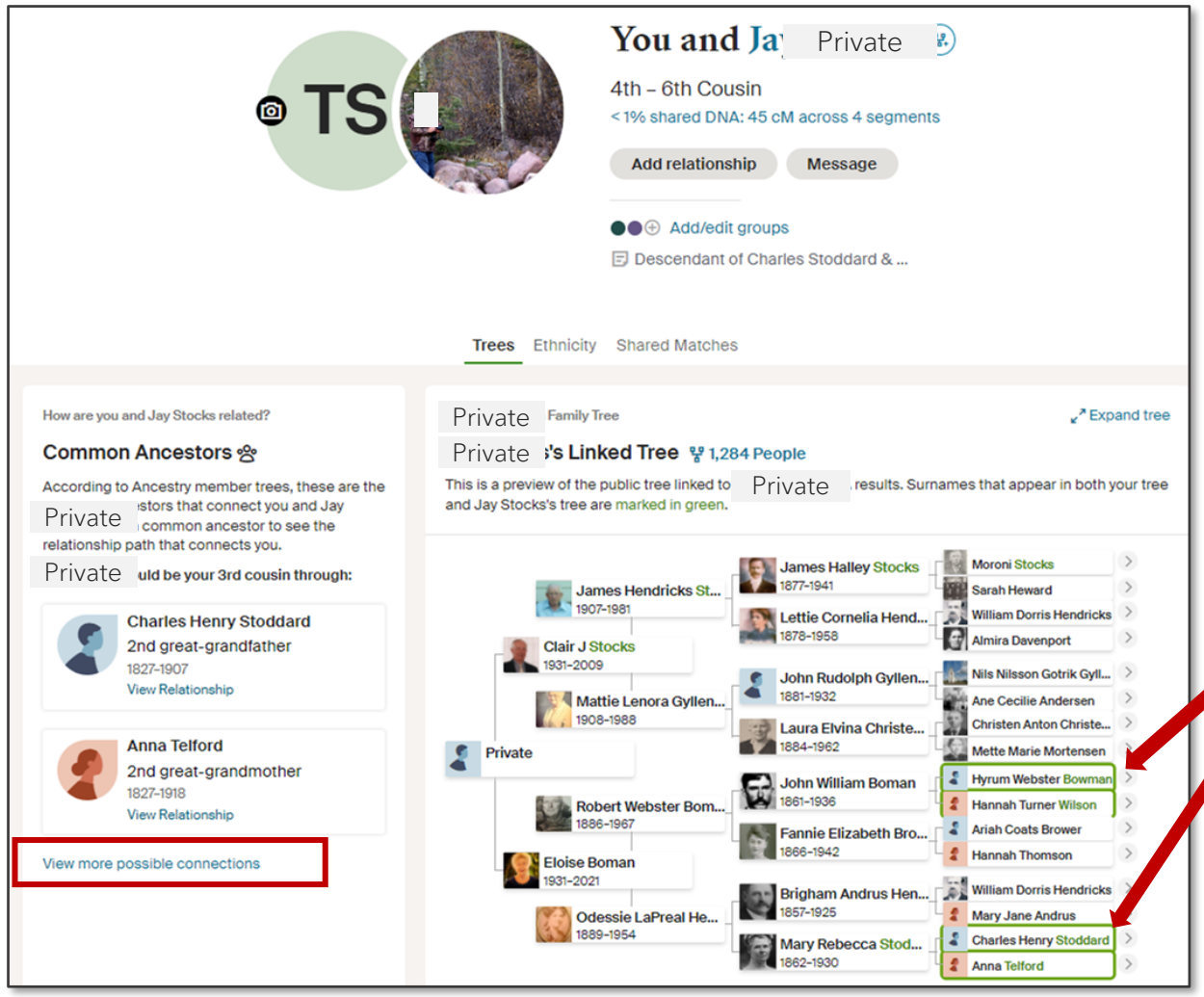


Shared cM Tool

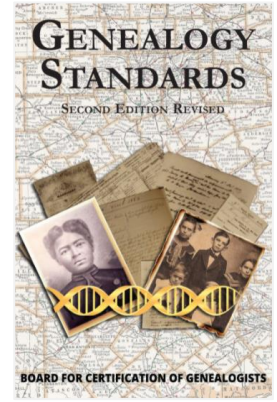
Smaller segments can be problematic because there are many possible relationships.



“Common Ancestor” Matches



You may share more than one common ancestor with a DNA match, even if the match’s tree does not show it.

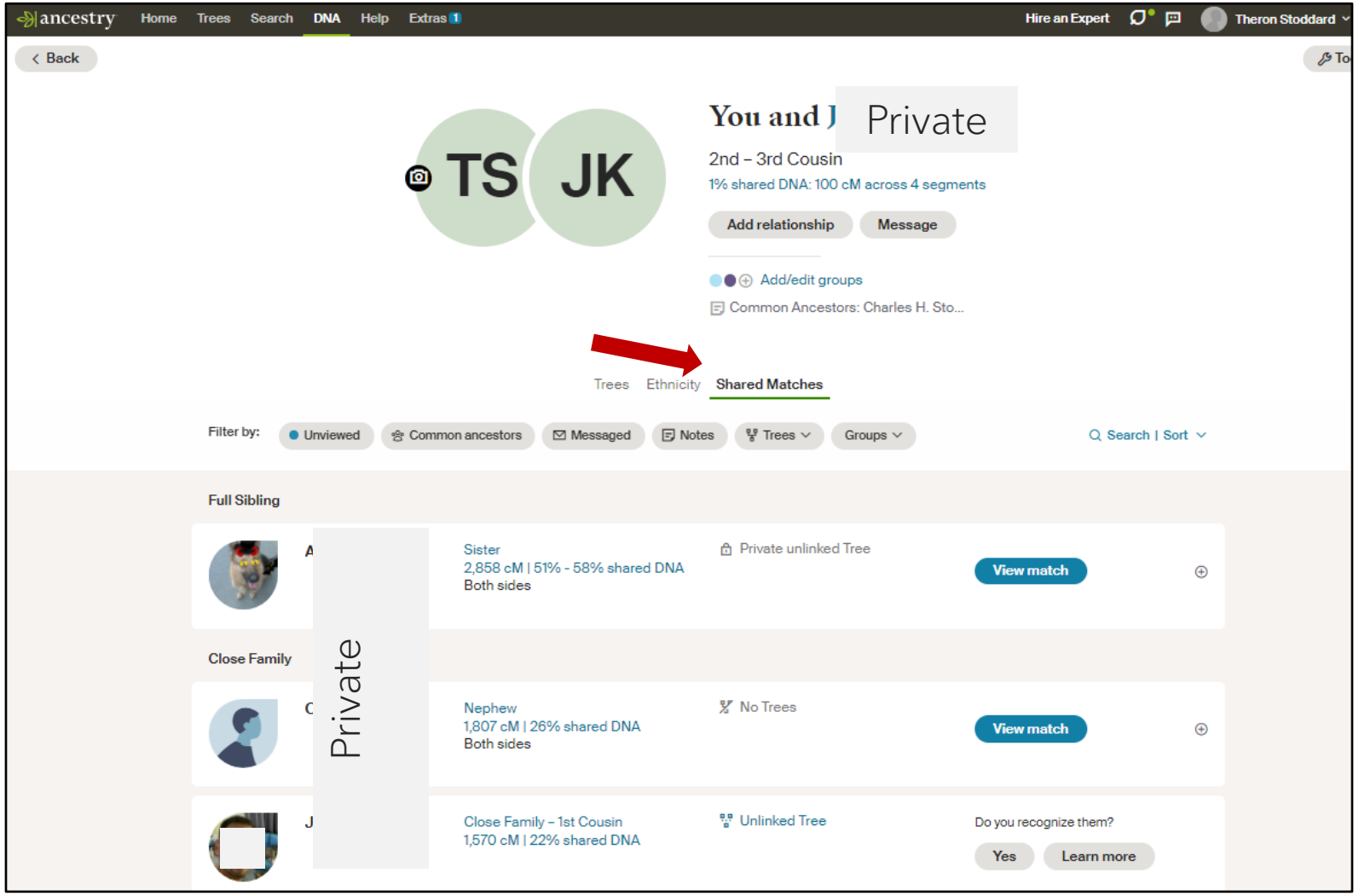


Build Up the DNA Focus Group

1. Determine your research question.
2. Identify your closest matches to your research question, meaning the matches with highest cM.
3. Add his/her Shared Matches to your DNA Focus Group.
4. Continue with other close matches.

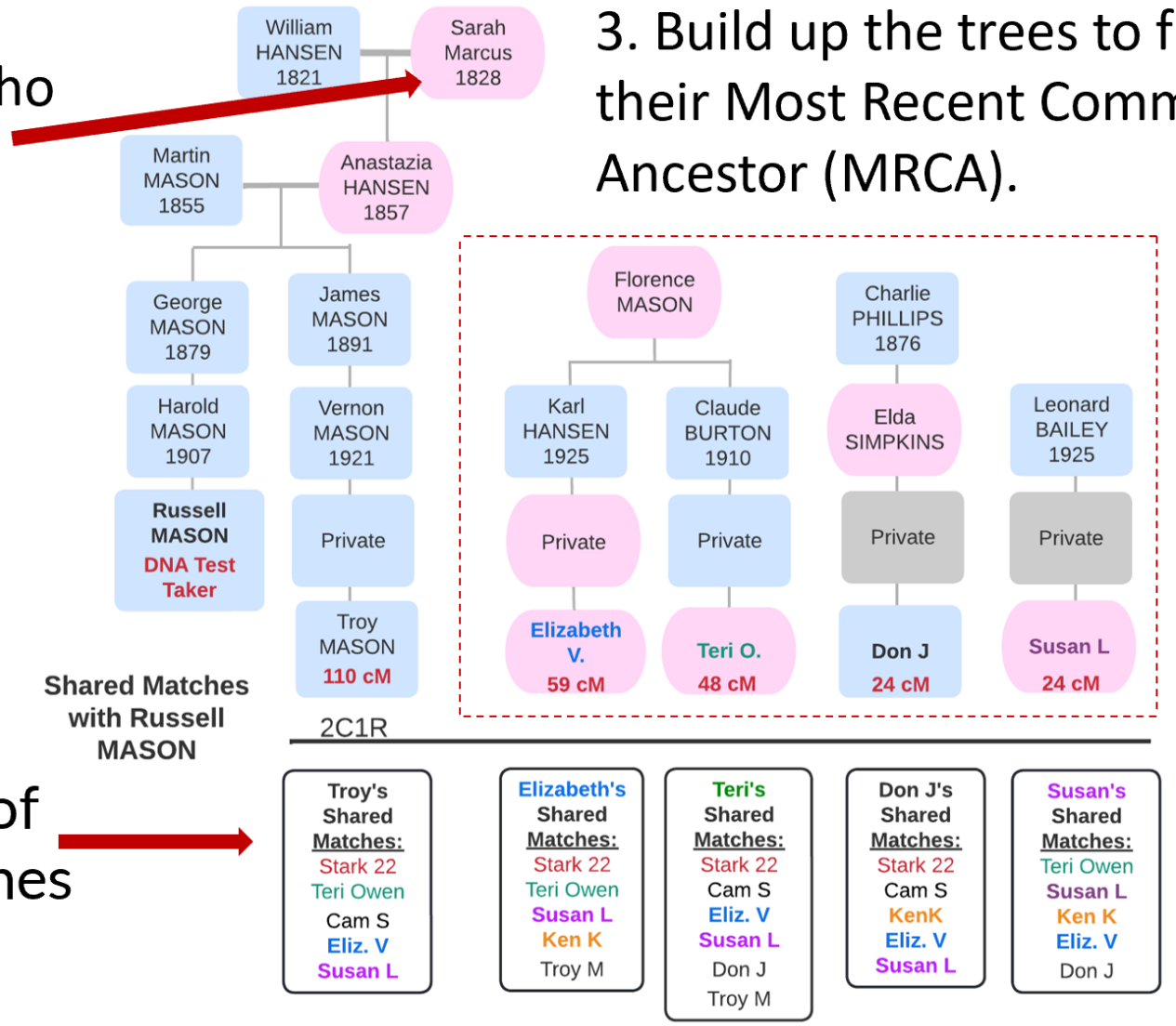
Shared Match List

Click on the Shared Match tab.



Build up a DNA Focus Group Using Shared Matches

1. Research Question: Who are Sarah's Parents?



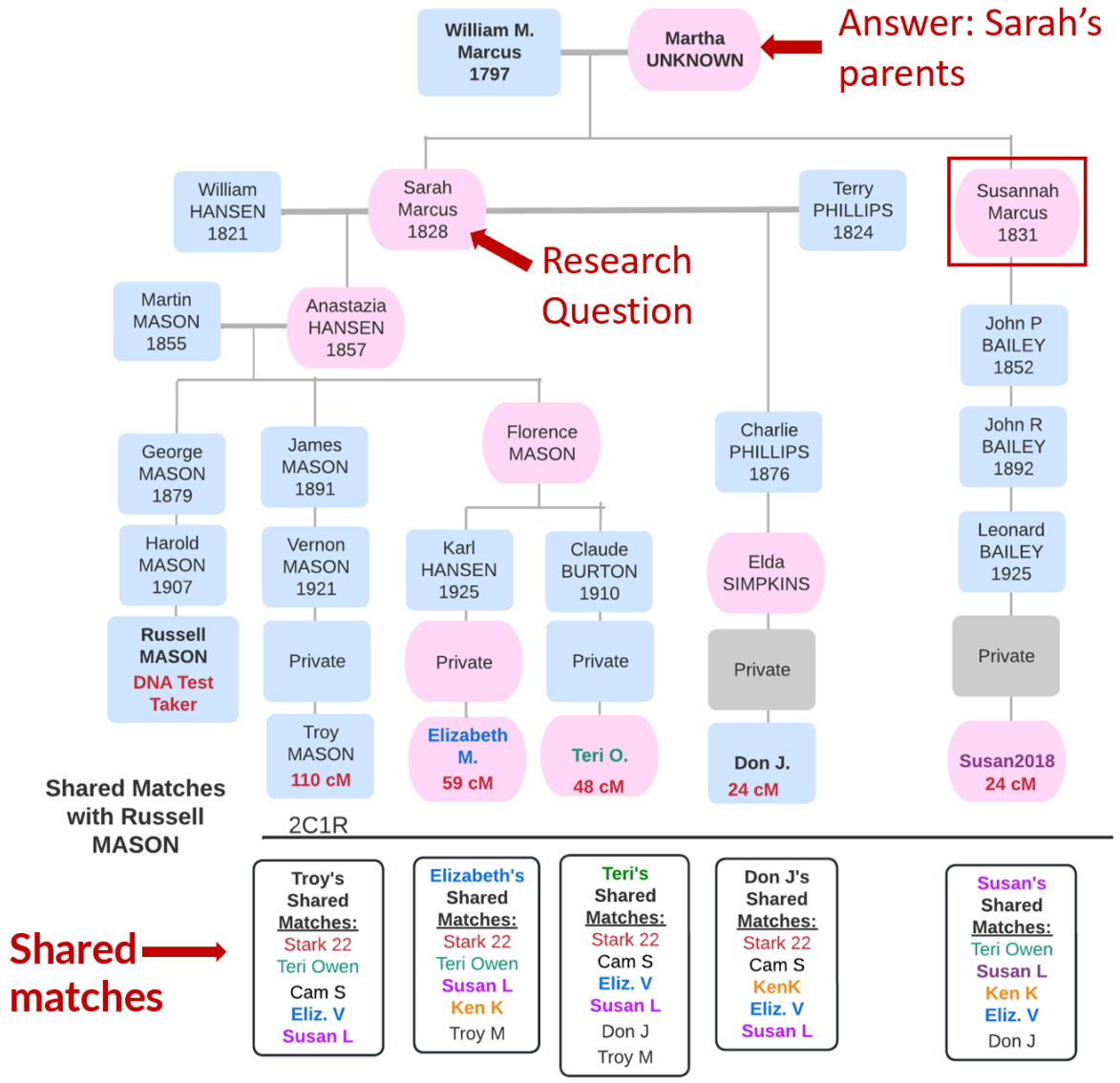
2. Create a Group of Shared DNA Matches

3. Build up the trees to find their Most Recent Common Ancestor (MRCA).

Build up a DNA Focus Group Using Shared Matches

This group of Shared Matches all tie back to the same MRCA.

Triangulated segments provide even stronger evidence.



Build Quick Trees For Your DNA Matches

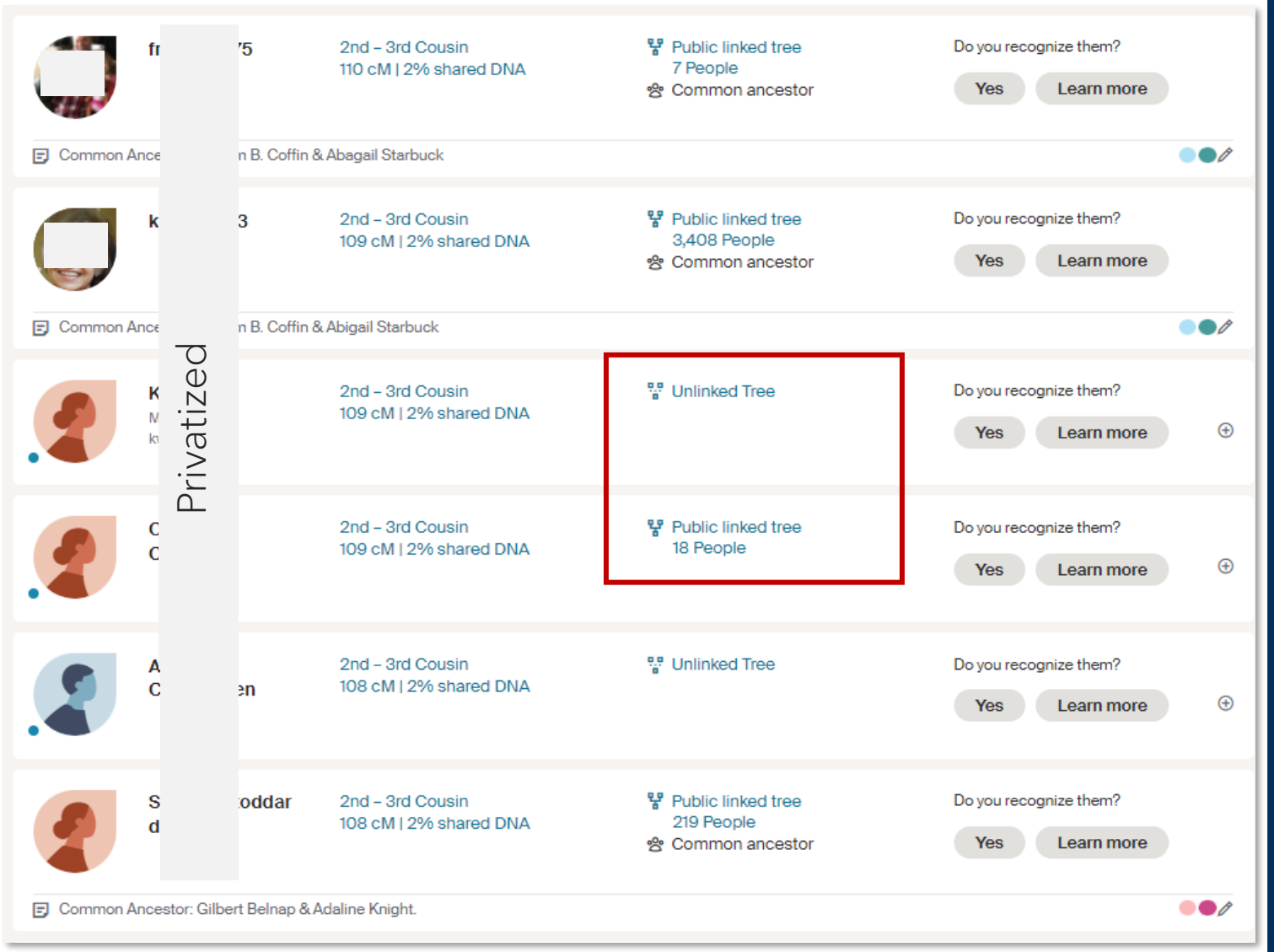
1. Use Ancestry's ThruLines or MyHeritage's "Theory of Family Relativity" to quickly build trees for your DNA matches.

Remember they both suggest <u>possible</u> relationships – verify everything!

Build Quick Trees For Your DNA Matches

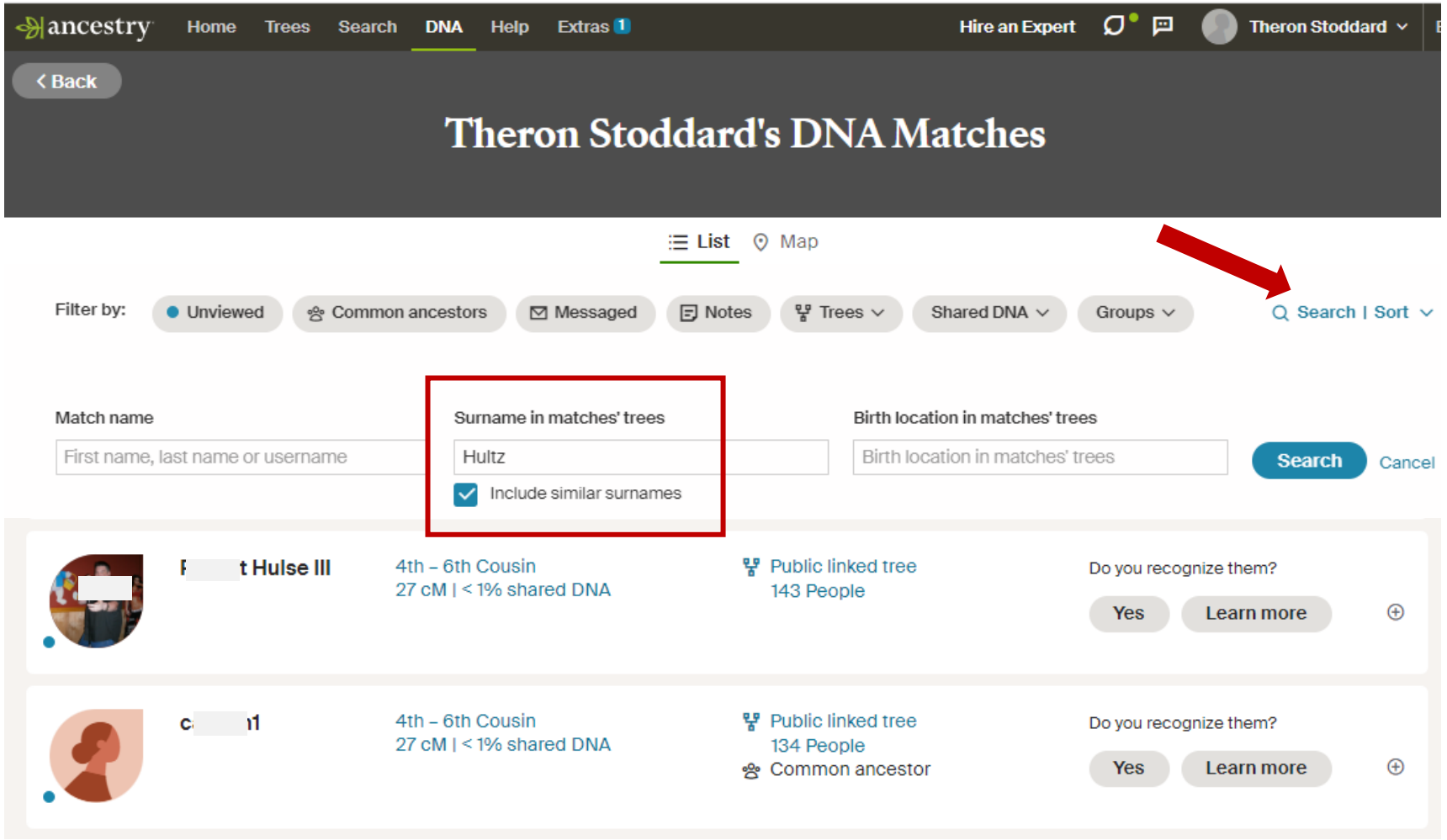
Use FamilySearch Family Tree, Ancestry's Public Member Trees, etc. to build quick trees for your DNA matches.

Verify the trees after finding a MRCA.



Build Trees For Your DNA Matches

Search your DNA matches for the surname you are looking for, especially if it is not a common surname.

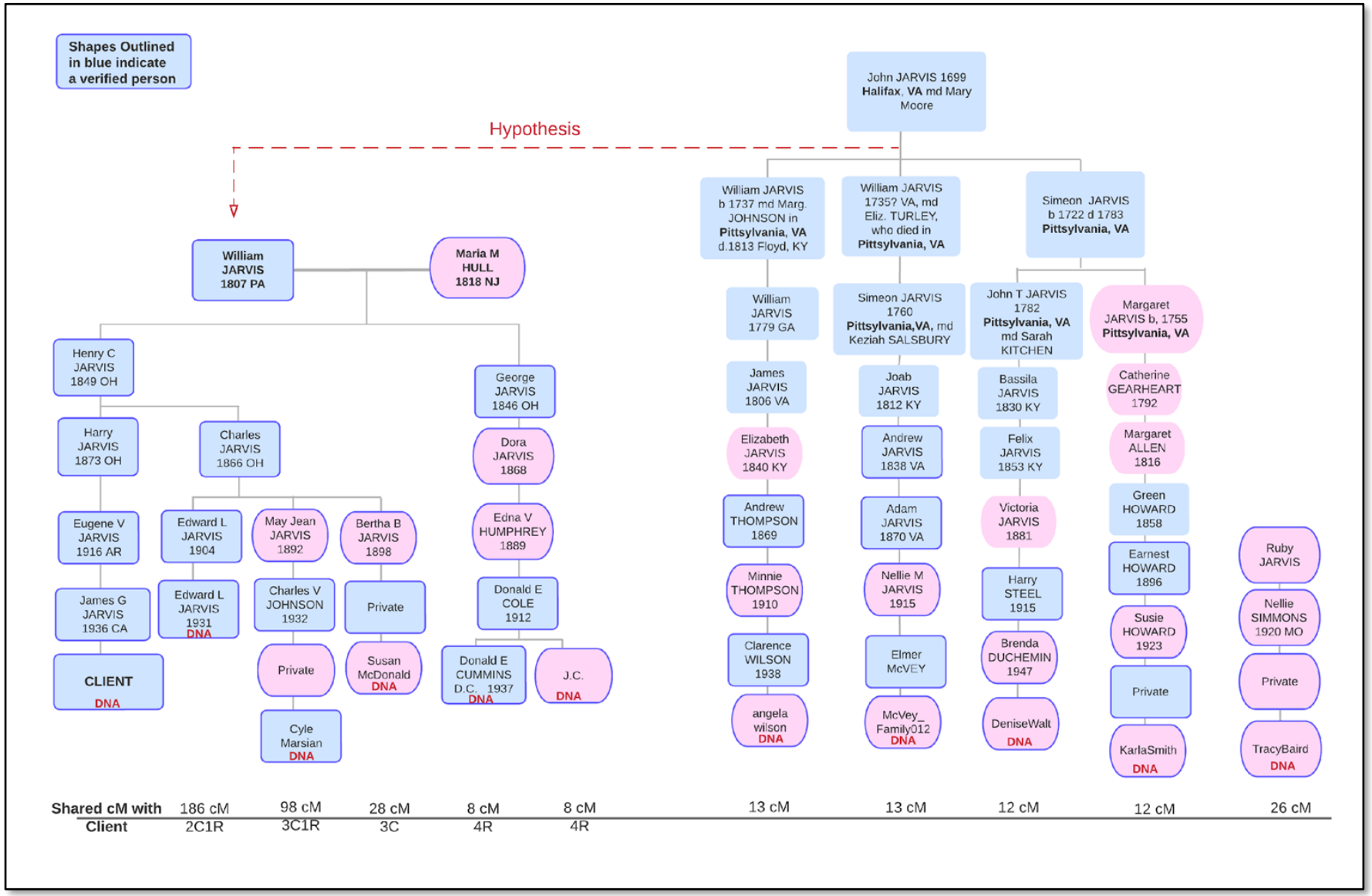


Identifying the Common Ancestor

Watch for unique surnames or locations.

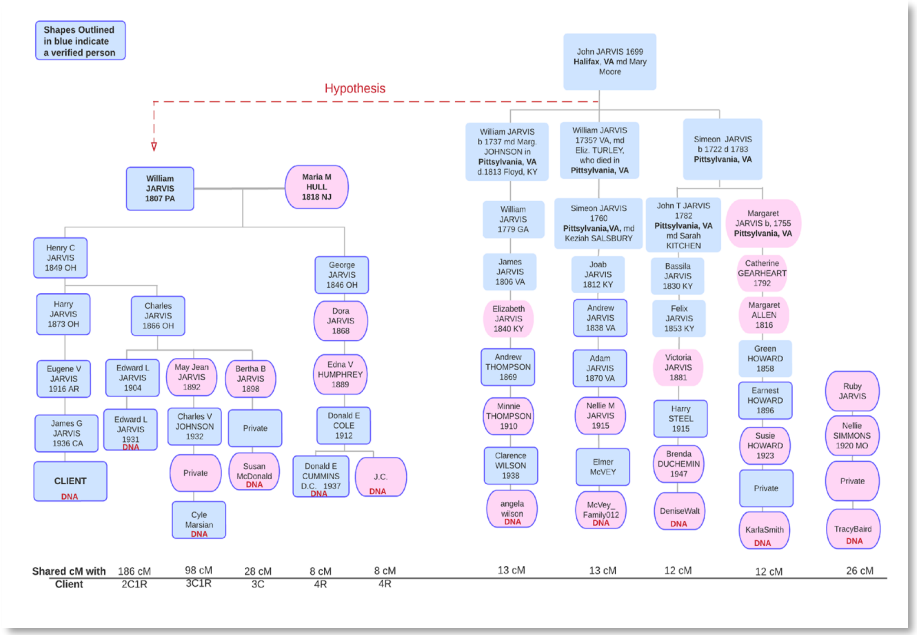
DNA leads to more records to search.

Build from the MRCA down.



Summary: Why DNA provides genealogical evidence

1. The more cM a person shares with a match, the closer the relationship is.
2. If you have multiple DNA matches in a shared match group, you can identify the Most Recent Common Ancestor (MRCA) you all descend from.



Questions?

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