

# Genetic Networks



May 1, 2025

Phoenix East Valley DNA Special Interest Group



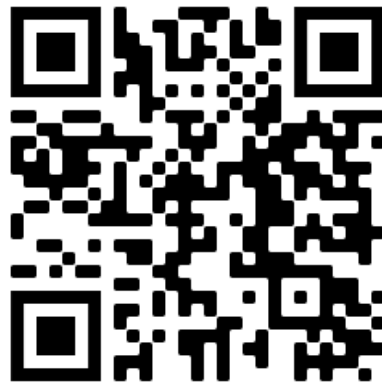
Ken waters

<http://familytreeaz.com/presentations>

Satwatcher.gen@gmail.com



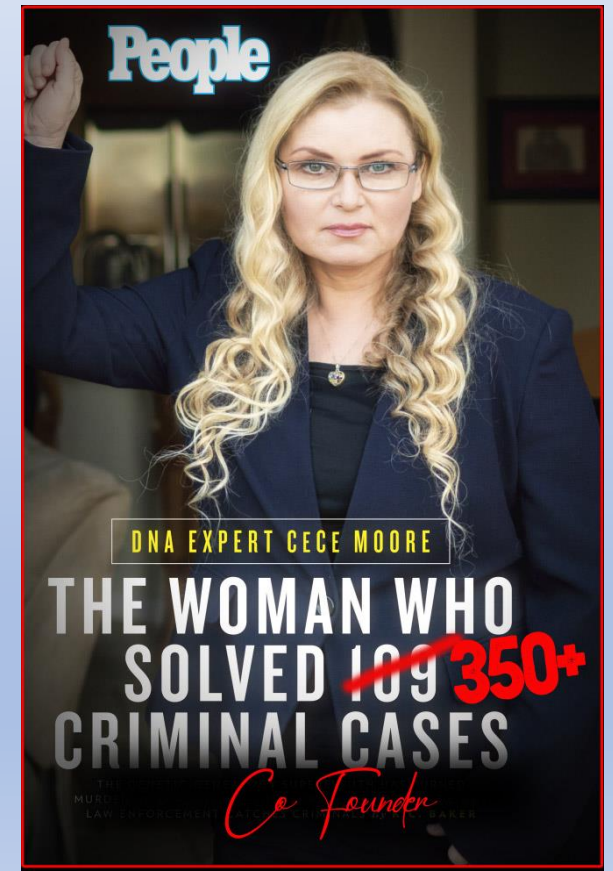
All slides and handouts can be found at:  
<http://www.familytreeaz.com/Presentations/>



QR Code: take photo to  
open to presentations

# First of All...

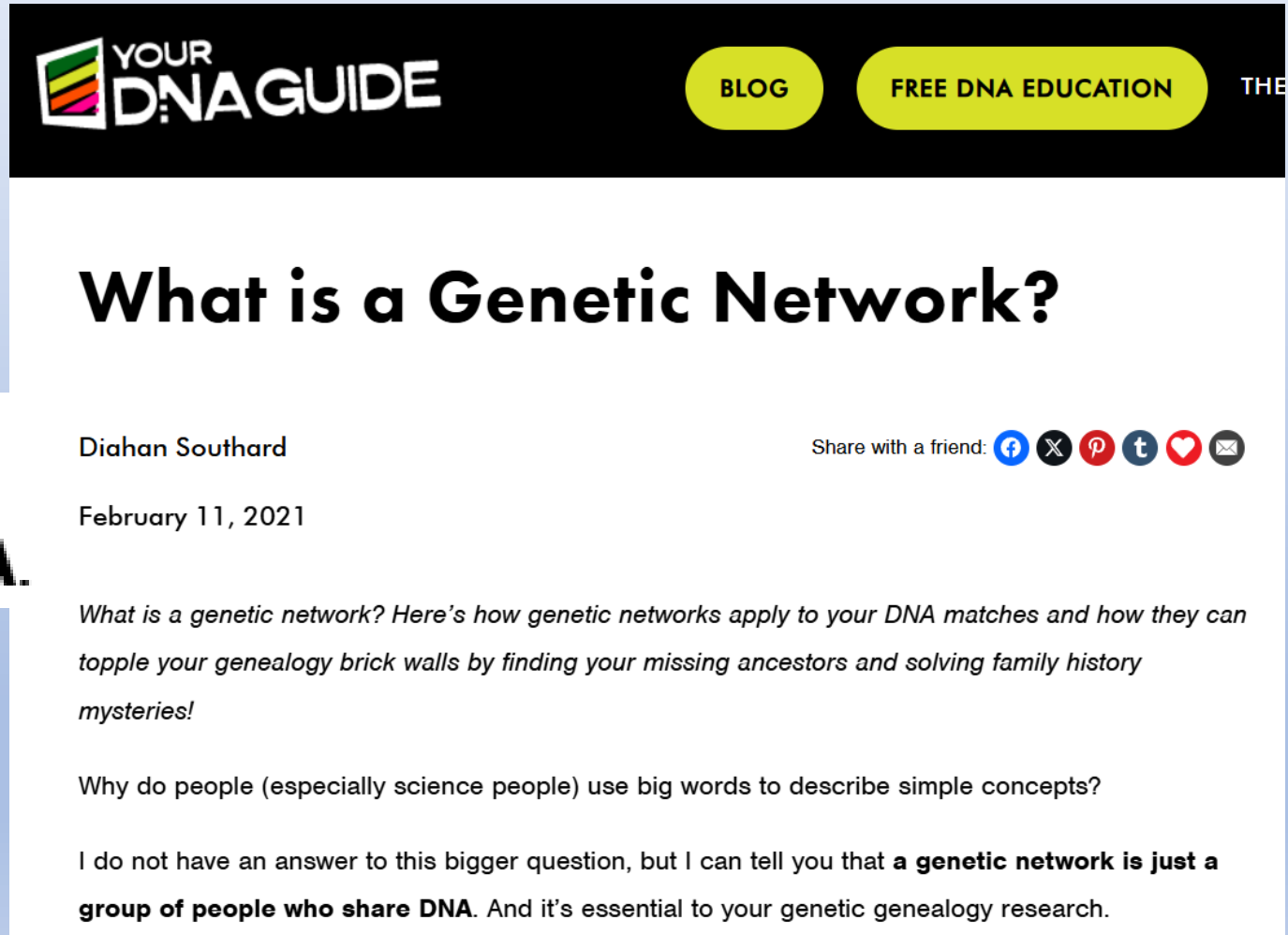
- Just what is a “Genetic Network”
- I first heard the phrase coined at an I4GG (Institute for Genetic Genealogy) conference held around 2018 or 2019
- CeCe Moore used the term in one of her presentations



# First of All...

- Just what is a “Genetic Network”

**a genetic network is just a group of people who share DNA.**



**YOUR DNA GUIDE** [BLOG](#) [FREE DNA EDUCATION](#) THE

## What is a Genetic Network?

Diahan Southard Share with a friend: [f](#) [x](#) [p](#) [t](#) [v](#) [e](#)

February 11, 2021

*What is a genetic network? Here's how genetic networks apply to your DNA matches and how they can topple your genealogy brick walls by finding your missing ancestors and solving family history mysteries!*

Why do people (especially science people) use big words to describe simple concepts?

I do not have an answer to this bigger question, but I can tell you that **a genetic network is just a group of people who share DNA**. And it's essential to your genetic genealogy research.

<https://www.yourdnaguide.com/ydgblog/what-is-genetic-network-dna>

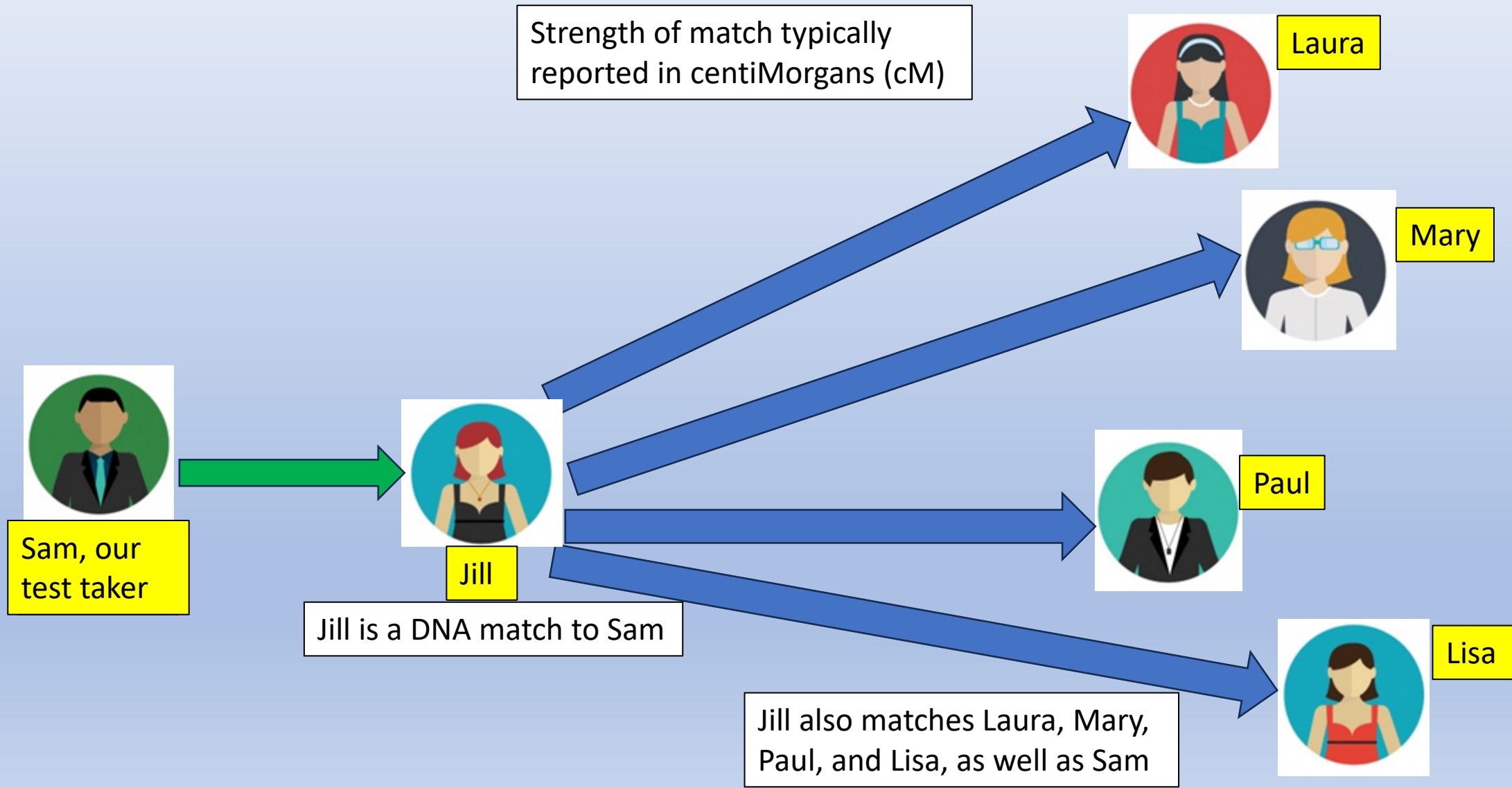
# First of All...

- Just what is a “Genetic Network”

**a genetic network is just a  
group of people who share DNA.**

- More specifically, for our purposes, it consists of a number of people who have taken DNA tests and who all match DNA with one test-taker, our primary subject

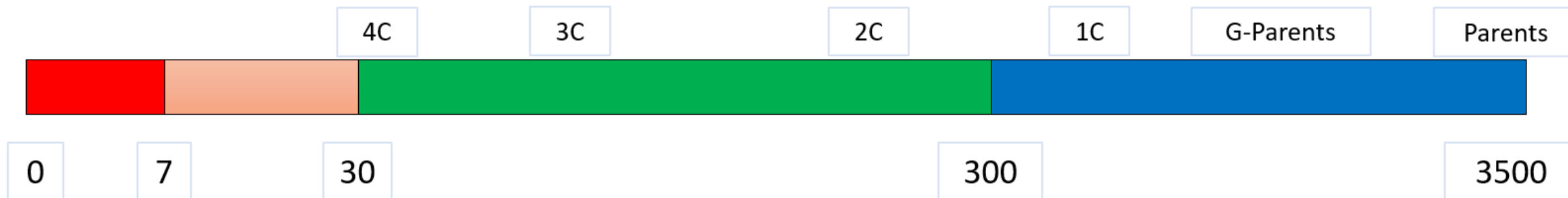
# Genetic Networks --- Simplified Concept



# Wait....a what...??! What is a centiMorgan?

- Numeric measure of “relatedness”
- From 0 to 3500
- 3500 indicates parent/child
- The larger the number of centiMorgans shared indicates a closer match
- 0 indicates no DNA shared

TIP: Just because you may not share any DNA with someone does not necessarily mean you are not related



# 5 Testing Companies

- All 5 testing companies will provide you a list of matches and a strength measure in cMs (or percentage which is easily converted to cMs)

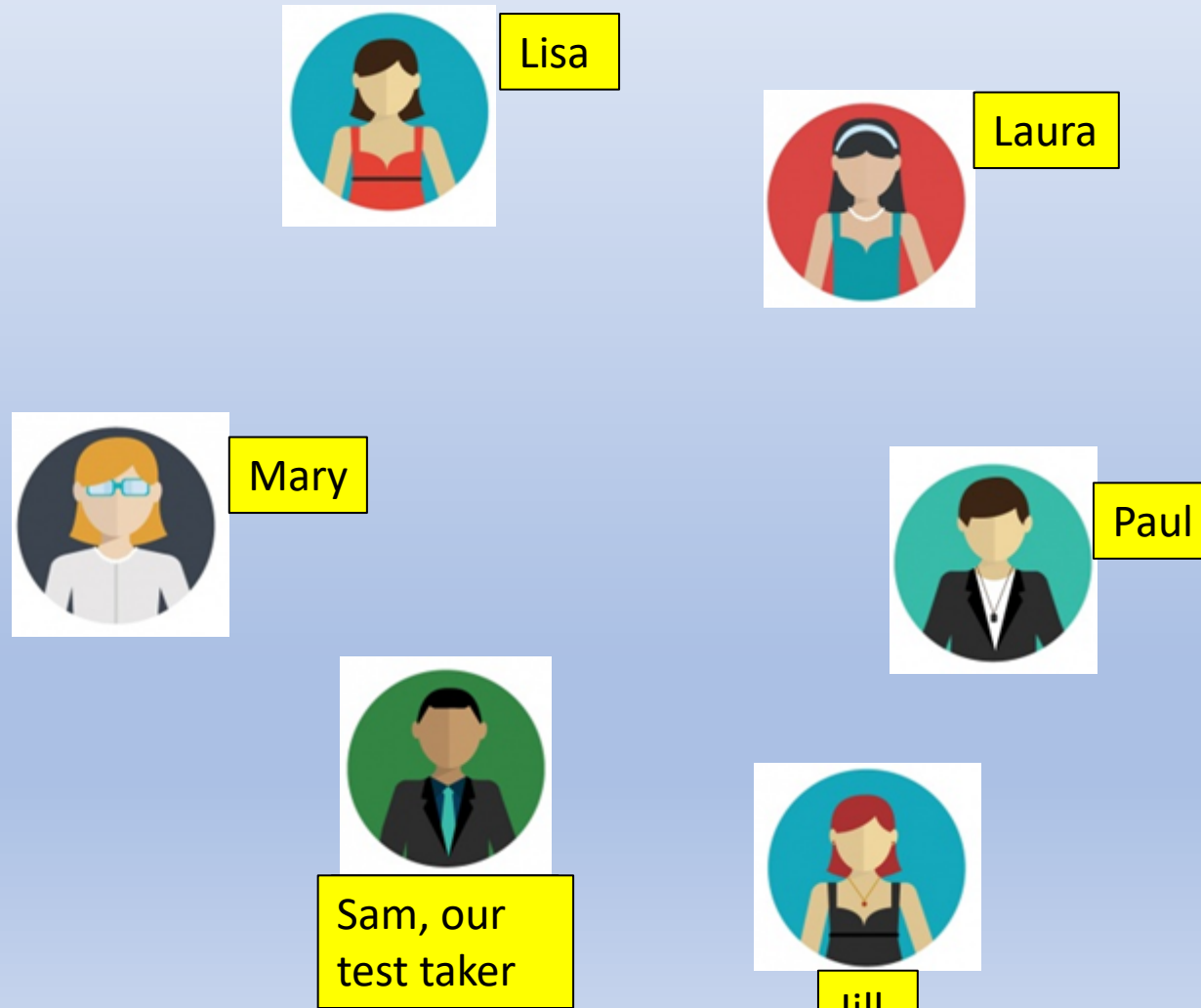


# What about...?

- Not a testing company but is another service to allow building of a genetic network using kits from the different testing companies
- I'm not going to focus on them for a couple of reasons:
  - Difficult interface (not for beginners)
  - Relatively small number of matches
  - Lack of a robust family tree mechanism
  - Issues concerning being sold multiple times and with various privacy concerns

The logo for GEDmatch, featuring the word "GED" in a large, bold, serif font, and the word "match" in a smaller, lowercase, serif font, both enclosed within large square brackets.

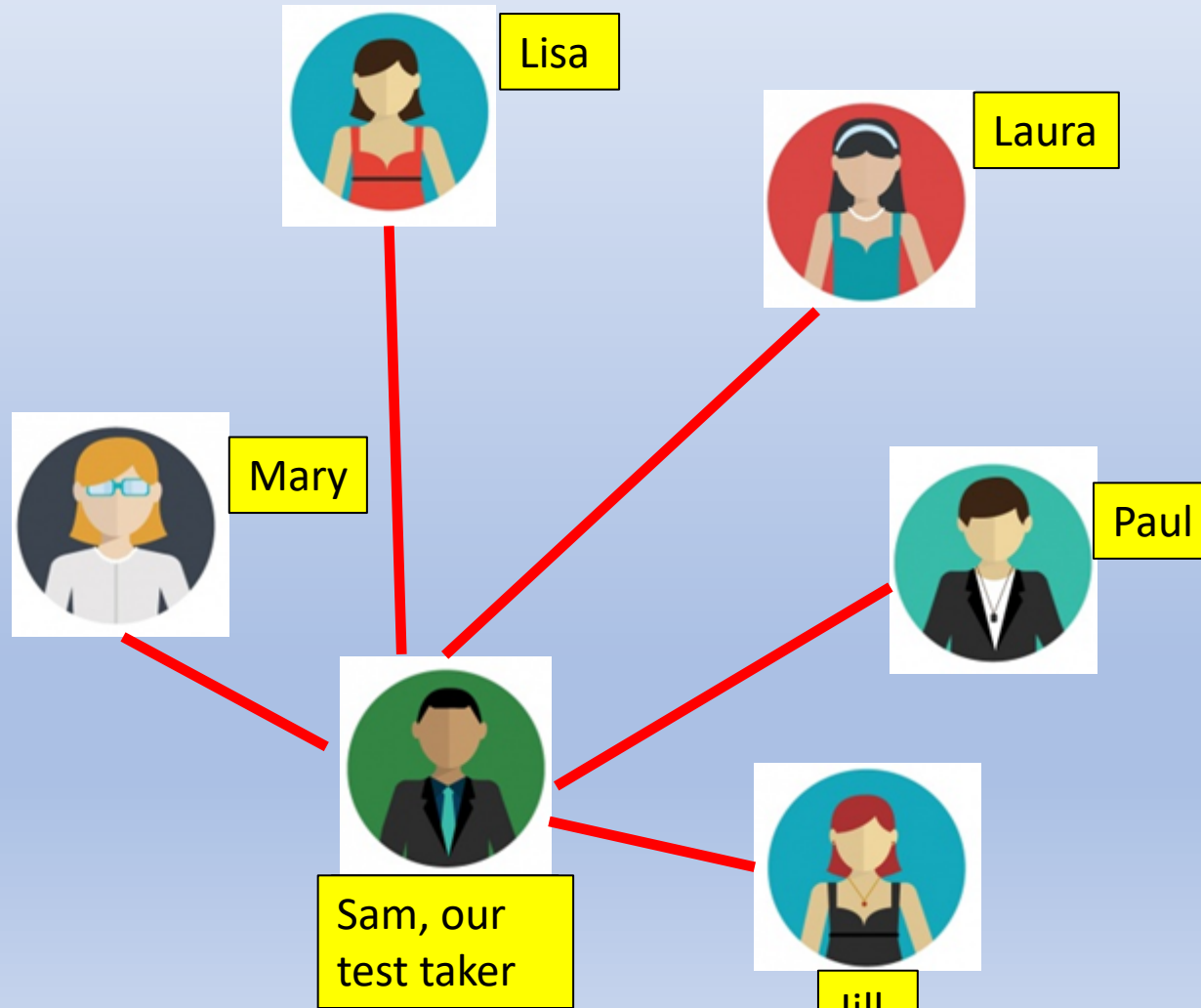
# Back to Our Genetic Network



**Presumption:**  
all these test  
takers share  
the same  
ancestral line

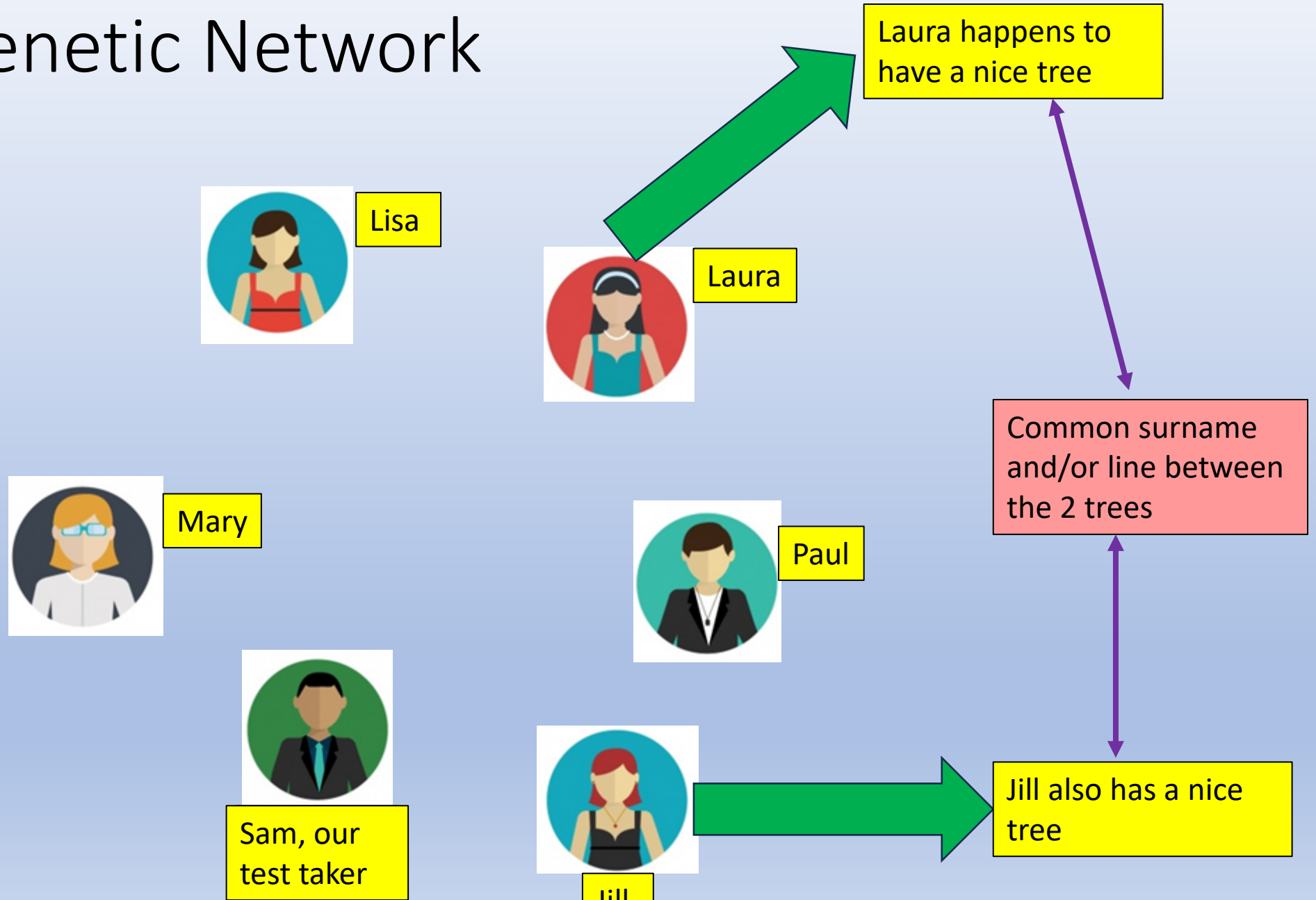
One caution: it is  
possible that one or  
more may be from a  
different line but that is  
not typical

# Our Genetic Network



Presumption:  
all these test  
takers share  
the same  
ancestral line

# Our Genetic Network



# Examples of Genetic Networks

- 23andMe












You have Relatives in Common

Each Relative in Common shares at least one small segment of DNA with k

[Find Relatives in Common](#)

You have Relatives in Common

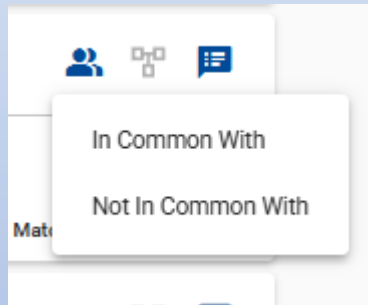
Each Relative in Common shares at least one small segment of DNA with Michael.

Relative in common	You	Michael	DNA Overlap 
 MH	1st Cousin, Once Removed (5.04)	Distant Cousin (0.08)	No
 CR	2nd Cousin (3.37)	Sister (49.67)	Request sent
 TH	2nd Cousin (2.41)	3rd Cousin (1.55)	Yes
 CW	2nd Cousin, Once Removed (2.25)	3rd Cousin (1.14)	Request sent
 LH	2nd Cousin, Once Removed (2.19)	Daughter (50.00)	Yes
 BV	3rd Cousin (1.01)	3rd Cousin (0.85)	Yes
 DH	3rd Cousin (0.90)	5th Cousin (0.11)	Yes
 JM	3rd Cousin (0.78)	3rd Cousin (0.62)	Yes
 LV	3rd Cousin (0.67)	4th Cousin (0.45)	Yes
 LA	3rd Cousin (0.66)	4th Cousin (0.41)	Yes

1 2 3 4 5 6 7 8 9 10 Next >

# Examples of Genetic Networks

- FamilyTreeDNA



Family Finder Matches Help

To link matches, you must first connect a family tree to a MyHeritage account. [Learn more](#)

All Matches Detail View Table View ☐ Exact Search  All

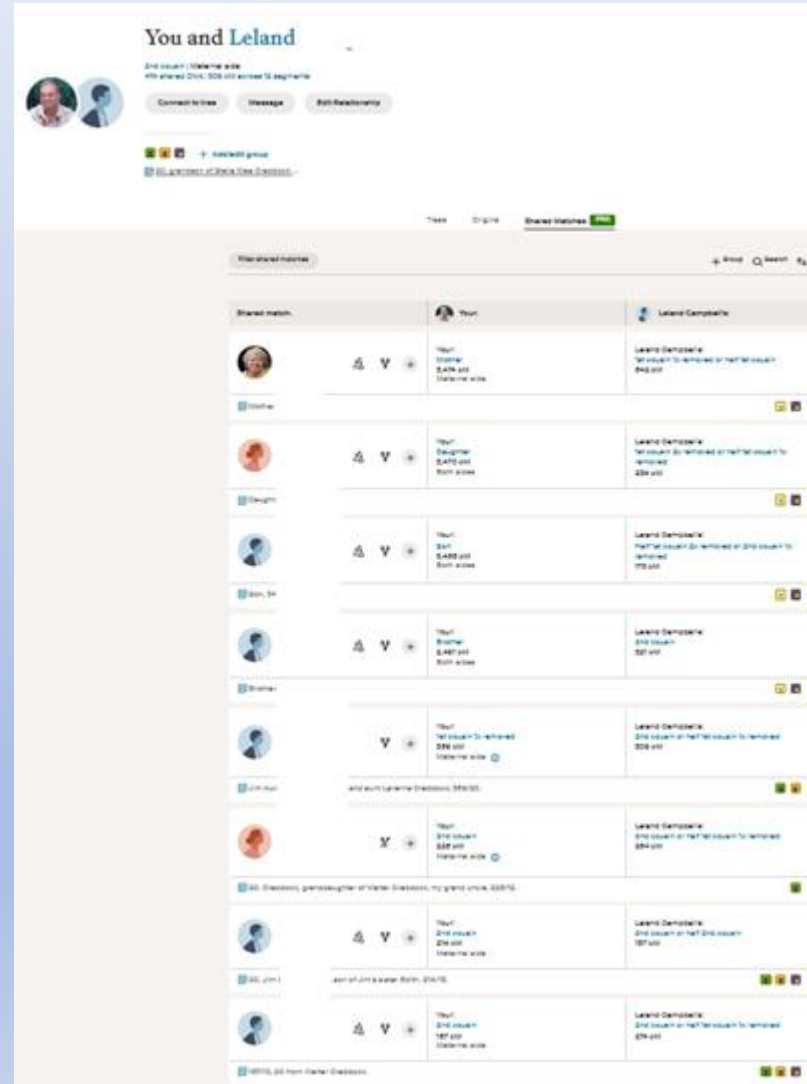
All (79) Paternal (58) Maternal (12) Both (1) Filter Sort by Export CSV

X J 79 Matches In Common | [Not In Common](#)

<input type="checkbox"/> <span>N</span> Ancestral Surnames Not Provided	Haplogroup Y-DNA: N/A mtDNA: N/A	Relationship Range Parent/Child <a href="#">Link on Family Tree</a>	Shared DNA 3565 cM	Longest Block 284 cM	X Match No Match Match date: May 12 2021
<input type="checkbox"/> <span>E</span> Ancestral Surnames Not Provided	Haplogroup Y-DNA: N/A mtDNA: N/A	Relationship Range Half Sibling, Uncle/Aunt/Niece/Nephew... <span>UNCLE</span> <a href="#">Unlink</a>	Shared DNA 1655 cM	Longest Block 168 cM	X Match No Match Match date: May 12 2021
<input type="checkbox"/> <span>N</span> Ancestral Surnames Not Provided	Haplogroup Y-DNA: N/A mtDNA: N/A	Relationship Range 1st Cousin - 2nd Cousin, Great/Half... <a href="#">Link on Family Tree</a>	Shared DNA 767 cM	Longest Block 129 cM	X Match No Match Match date: May 14 2021
<input type="checkbox"/> <span>N</span> Ancestral Surnames <a href="#">View Details</a> collins, dabbins, jeffers, Morgan, Pruitt	Haplogroup Y-DNA: R1.151	Relationship Range 2nd Cousin - 5th Cousin	Shared DNA 21 cM	Longest Block 22 cM	X Match No Match


























# Examples of Genetic Networks

- Ancestry
  - Looking at my DNA kit that matches “Leland”
  - Very long list: 138 shared matches ranging from very close to me down to those with only 8 cMs



# Examples of Genetic Networks

- Living DNA

Relatives Ken and C have in common				
	<u>R.</u> Less active  DNA Owner 	4th cousin or greater 0.16% DNA shared (11.36cM) <a href="#">1 shared segment</a>	7 shared matches <a href="#">Edit matchbox</a> 	
	<u>An.</u> Less active  DNA Owner 	4th cousin or greater 0.21% DNA shared (14.99cM) <a href="#">2 shared segments</a>	2 shared matches <a href="#">Edit matchbox</a> 	
	<u>I.</u> Less active  DNA Owner 	4th cousin or greater 0.27% DNA shared (19.74cM) <a href="#">3 shared segments</a>	2 shared matches <a href="#">Edit matchbox</a> 	
	<u>Ja.</u> Less active  DNA Owner 	4th cousin or greater 0.38% DNA shared (27.47cM) <a href="#">4 shared segments</a>	6 shared matches <a href="#">Edit matchbox</a> 	
	<u>He.</u> Less active  DNA Owner 	4th cousin or greater 0.38% DNA shared (27.47cM) <a href="#">4 shared segments</a>	6 shared matches <a href="#">Edit matchbox</a> 	

# Examples of Genetic Networks

- MyHeritage

Shared DNA Matches

Joan Waters (born Craddock) and I share the following 1,499 DNA Matches

Sort by

Probable relationship to Joan Waters (born Craddock)	Shared match	Probable relationship to
1st cousin's granddaughter	4.9% (316.8 cM)	Daughter
Son	49.8% (3,527.8 cM)	2nd cousin
Son	49.8% (3,533.9 cM)	2nd cousin
Granddaughter	28.4% (2,011.5 cM)	2nd cousin's daughter
Grandson	27.8% (1,955.5 cM)	2nd cousin's son
1st cousin's son	4.8% (337.0 cM)	3rd cousin
2nd cousin's son	1.9% (135.4 cM)	3rd cousin
2nd cousin's daughter	1.3% (93.4 cM)	3rd cousin
2nd cousin's daughter	1.4% (95.8 cM)	4th cousin

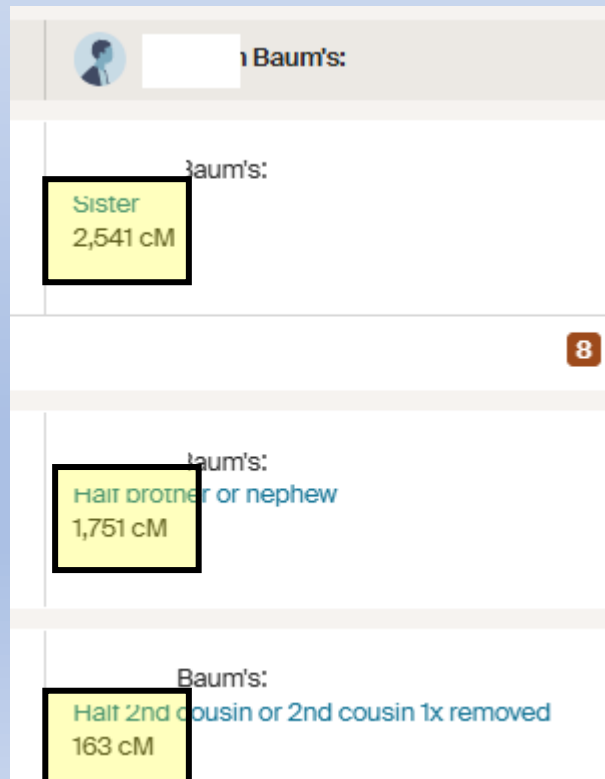
# Three Companies Take It an Important Step Further

- Not only do they report how much DNA you share with each shared match but they also share how much DNA each one of them share with each other!

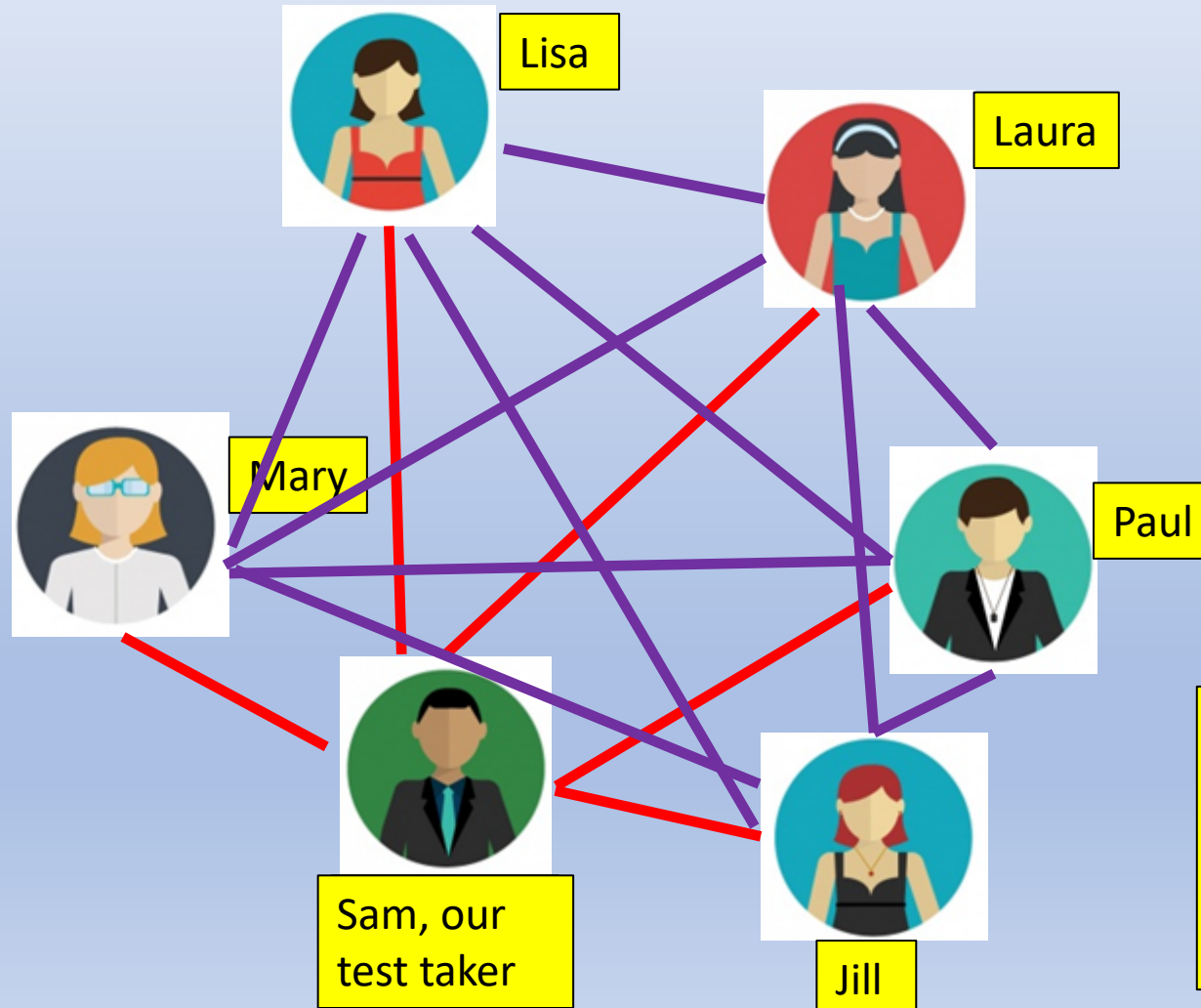


# Why is This So Important?

- You can easily detect close relationships between your matches (e.g., parent-child, sibling, 1<sup>st</sup> cousin, etc.)
- This information can allow you to start building a relational tree



# Back to Our Genetic Network



Red lines indicate how much DNA is shared with each shared match.

Now with the purple lines, we can tell, for instance, that Paul might be father of Laura and Lisa












Again, 3 of the 5 companies allow some sort of mechanism to see how much each shared match shares with each other: Ancestry, MyHeritage, and 23andMe

# Example of MyHeritage Showing Shared Matches Relationships

Shared DNA Matches ⓘ







Joan Waters (born Craddock) and Li: share the following 315 DNA Matches

Sort by

Probable relationship to Joan Waters (born Craddock)	Shared match	Probable relationship to Li
4th cousin's daughter	0.2% (13.7 cM)  0.9% (66.7 cM) <input type="checkbox"/> D:  	3rd cousin  >
3rd cousin's daughter, 4th cousin's daughter	0.5% (36.2 cM)  0.7% (51.3 cM) <input type="checkbox"/> L:  	4th cousin  >
4th cousin's daughter	0.5% (32.6 cM)  0.7% (49.9 cM) <input type="checkbox"/> R: 	3rd cousin's daughter, 4th cousin  >

Sort by the strength of the shared match's shares

# Example of 23andMe Showing Match Strength Between Different Shared Matches

Relative in common	You	k [redacted]
 CR [redacted]	2nd Cousin (3.37)	Aunt (27.01) ←
 ME [redacted]	2nd Cousin (2.84)	Father (50.00) ←
 S [redacted]	2nd Cousin (2.41)	2nd Cousin, Once Removed (1.18) ←
 CW [redacted]	2nd Cousin, Once Removed (2.25)	2nd Cousin, Twice Removed (0.92)
 BV [redacted]	2nd Cousin, Once Removed (1.01)	3rd Cousin, Once Removed (0.40)
 K [redacted]	3rd Cousin (1.17)	3rd Cousin, Once Removed (0.66)

# Example of a DNA Relational Tree

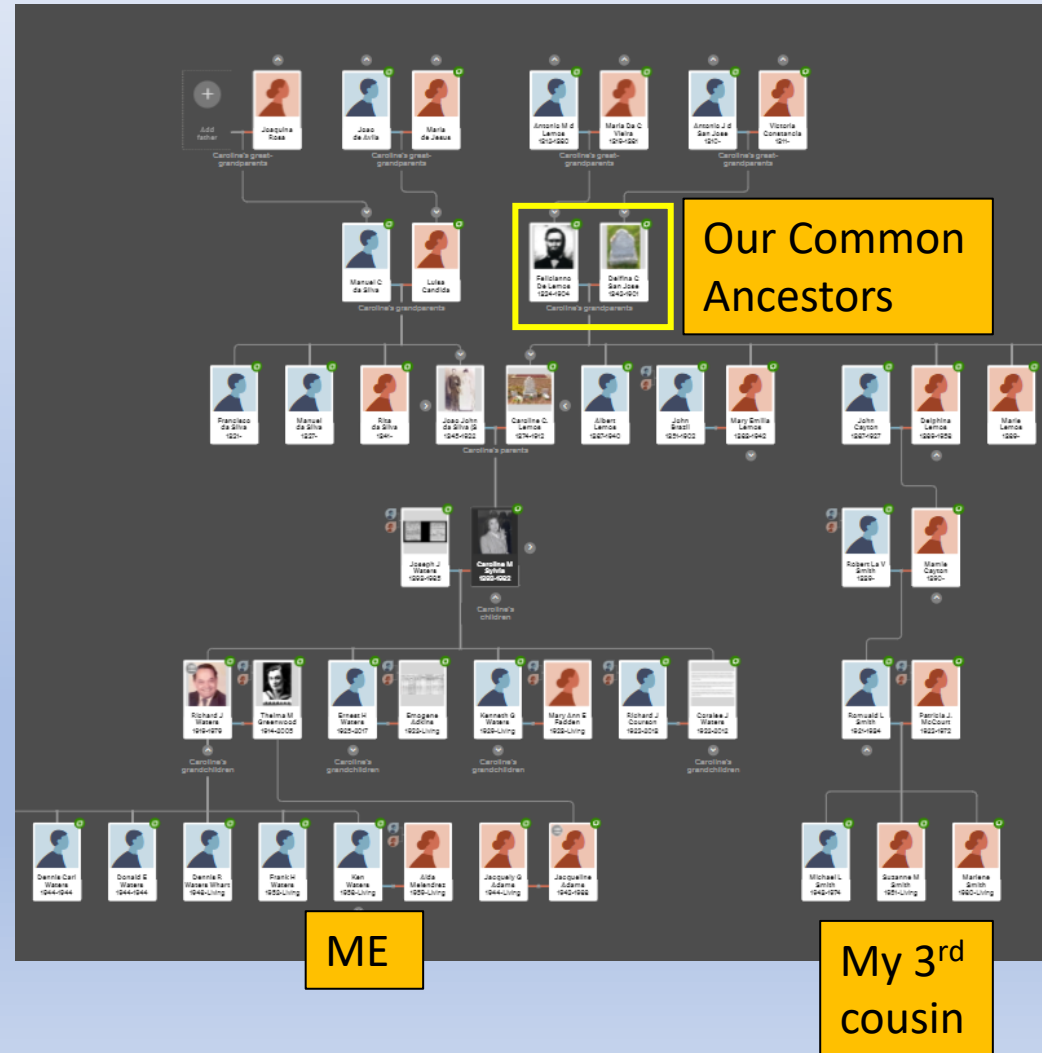
- I build these often, placing DNA matches in a relational tree to allow visualization of a Genetic Network
- The relationships shown were determined by comparing DNA shared between different shared matches in a Genetic Network

Note: I created this chart in LucidChart and show the DNA each test taker has with the subject shown in green



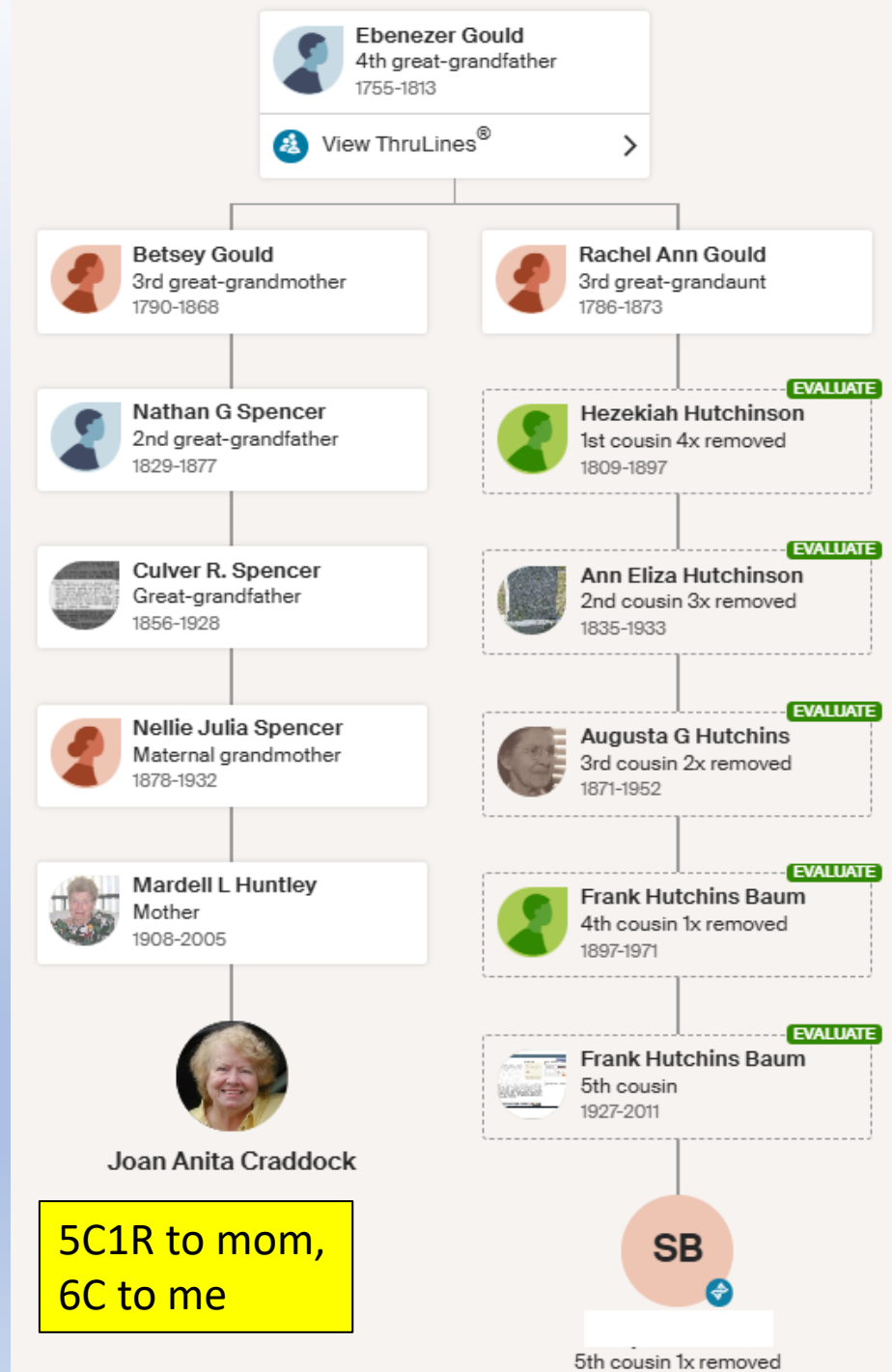
# Goal: Find the Most Recent Common Ancestor (MRCA)

- Finding common ancestors allows determination of exact relationship
- Once this is found then we can compare to other matches to help see how they are related as well



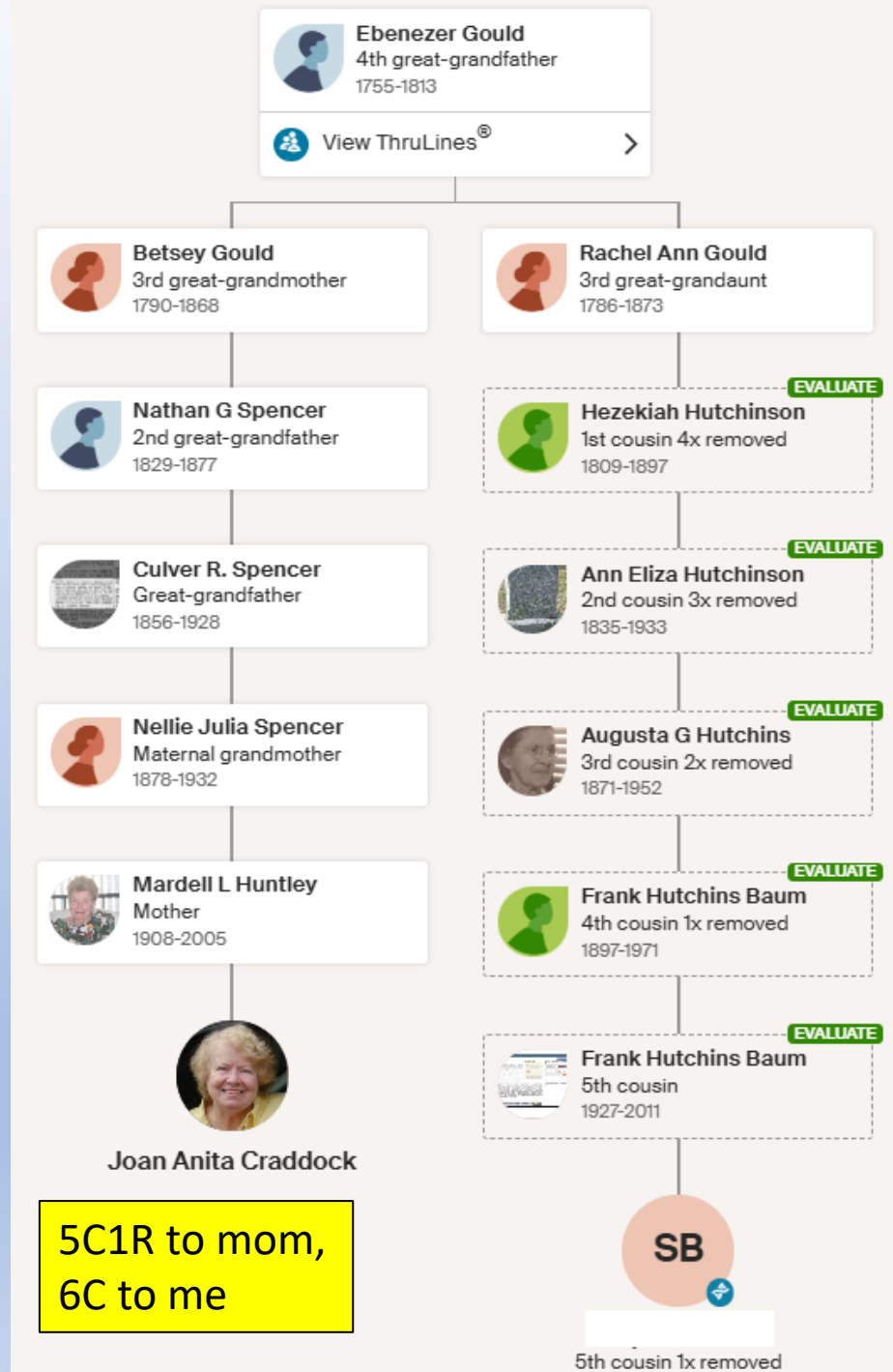
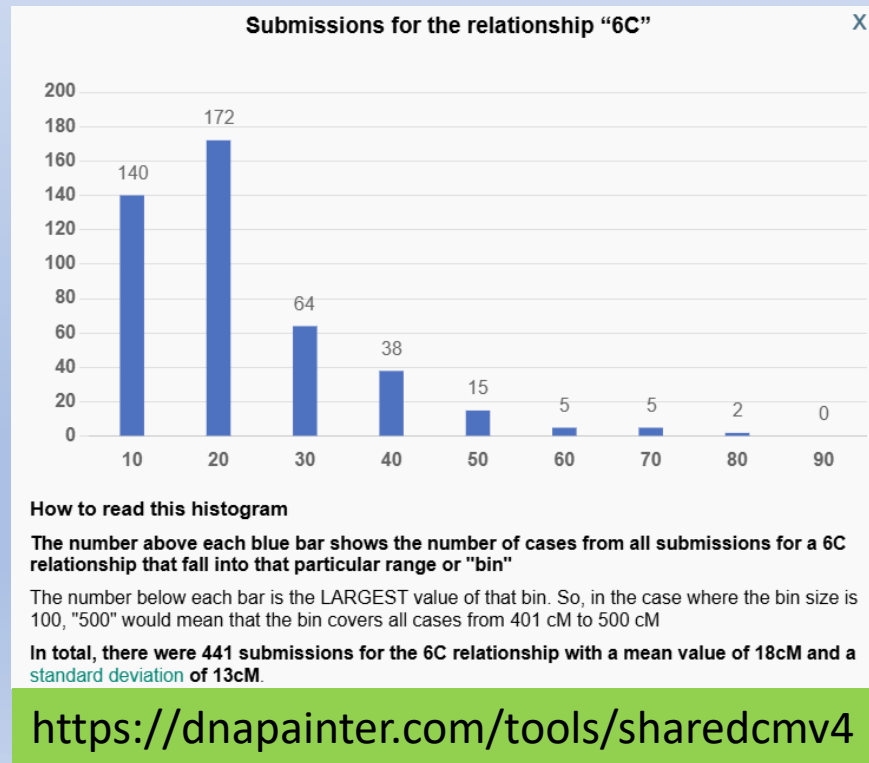
# Anchor Match

- Any match that is:
  - In a Genetic Network
  - Has been identified as a 3C, 4C, 5C, or 6C
  - Has been verified with:
    - Tree research (paper genealogy)
    - Shared matches to the line
- Very useful as these matches can be used to identify what line any other matches are in



# Anchor Match

- Match to Me: 31 cMs (44 cMs) --- a LOT for 6C, so potentially/possibly a double cousin plus Mom's match is only 36 cMs

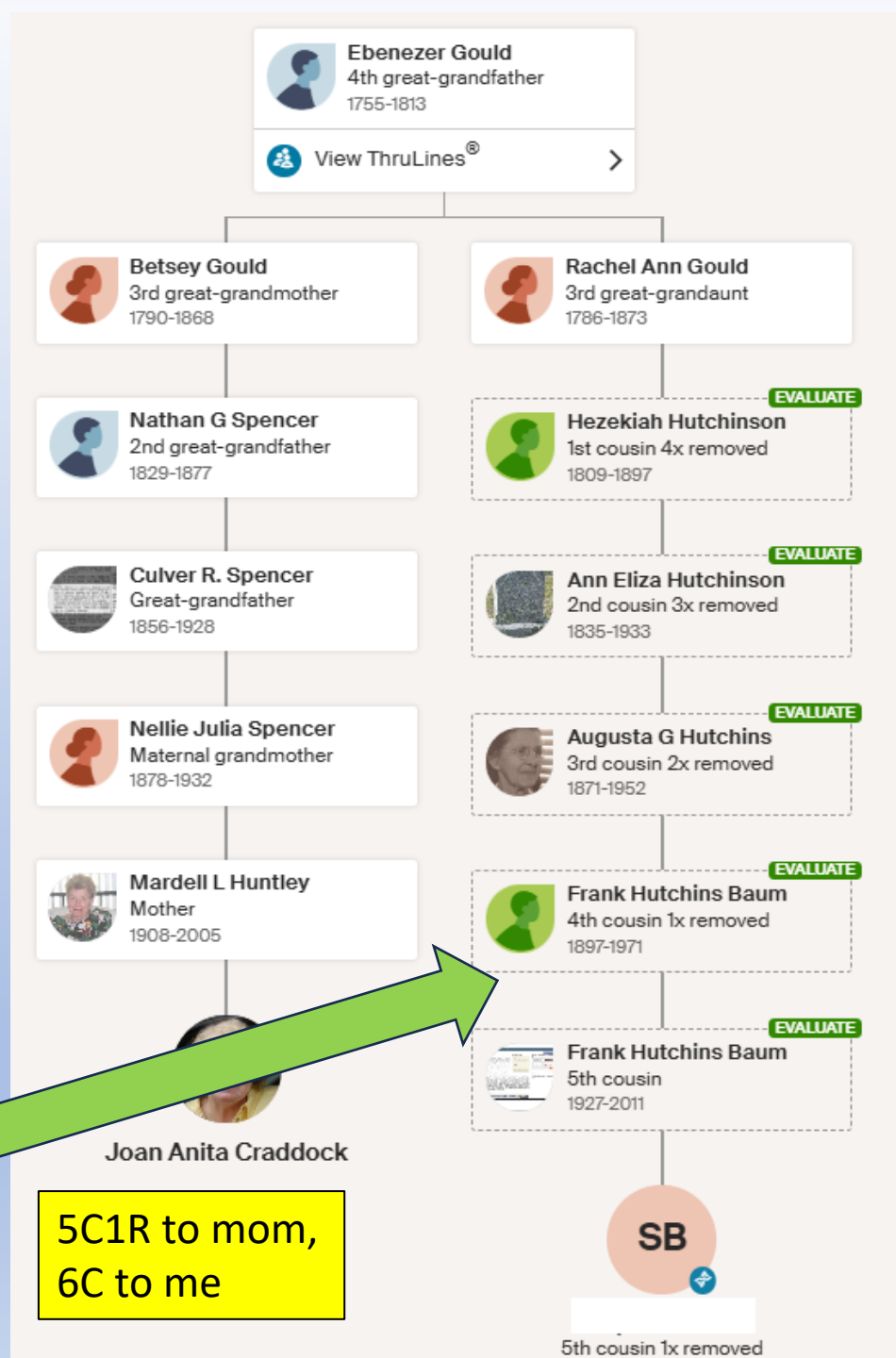


# Anchor Match

- Match to Mom: 36 cMs (36 pre-Timber), 5C1R
- Match to Me: 31 cMs (44 cMs) --- a LOT for 6C, so potentially/possibly a double cousin















Special Note of interest: This match's line is most likely part of Lyman Frank Baum's line (Chittenango, NY)









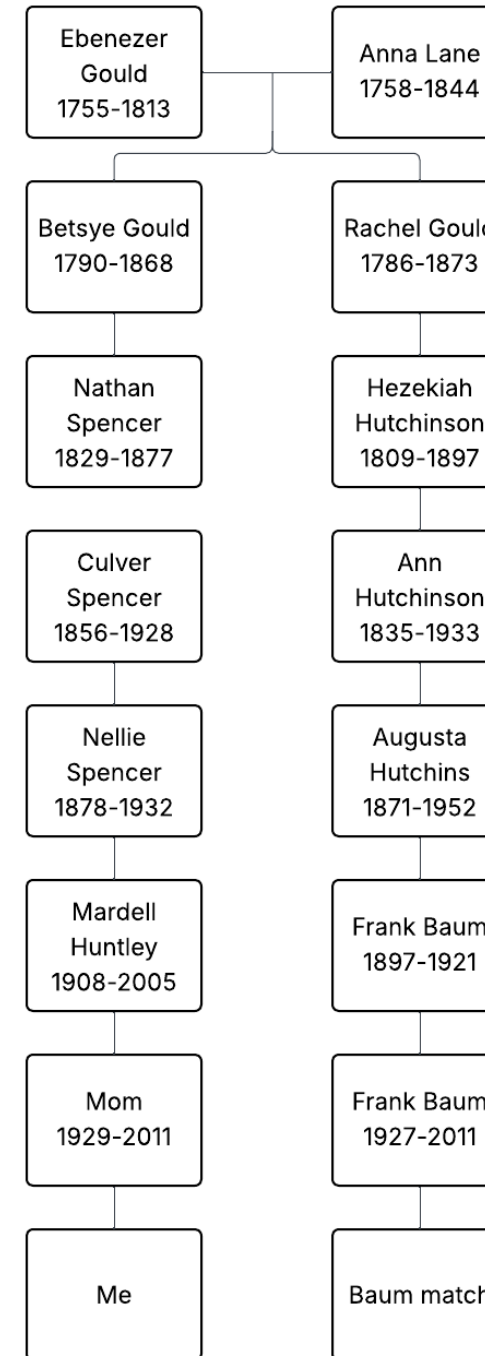
# Anchor Match

- Now I can look at shared matches to this match to “infer” what ancestral line these people are from
- Be Careful! Verify each, especially for an Anchor Match that is more distant (e.g., 6C) as this one is --- increasing the possibility of some of these shares coming from a different line

Shared match:		Your:	Baum's:
 Baum		Your: 4th cousin or half 3rd cousin 1x removed 12 cM Maternal side	Baum's: Sister 2,541 cM
6C Gould/Lane			8
 Ji M Bi		Your: Half 3rd cousin 1x removed or 4th cousin 17 cM Maternal side	Baum's: Half brother or nephew 1,751 cM
 P M Ei		Your: 4th cousin or half 3rd cousin 1x removed 11 cM Maternal side	Baum's: Half 2nd cousin or 2nd cousin 1x removed 163 cM
 tt		Your: 4th cousin or half 3rd cousin 1x removed 12 cM Maternal side	Baum's: 3rd cousin 107 cM
 M M		Your: Half 3rd cousin 1x removed or 4th cousin 13 cM Maternal side	Baum's: 3rd cousin or half 2nd cousin 1x removed 98 cM
 D		Your: 4th cousin or half 3rd cousin 1x removed 9 cM Maternal side	Baum's: 3rd cousin or half 2nd cousin 1x removed 91 cM

# Anchor Match

Shared match:	Your:	Baum's:
 Baum	Your: 4th cousin or half 3rd cousin 1x removed 12 cM Maternal side	Baum's: Sister 2,541 cM
6C Gould/Lane		8
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 D	Your: 4th cousin or half 3rd cousin 1x removed 9 cM Maternal side	Baum's: 3rd cousin or half 2nd cousin 1x removed 91 cM



Any subsequent shared match can be presumed to have an MRCA somewhere in this line

----- L Frank Baum link

# One Important Note on Ancestry

- Accessing the tool to see how much each shared match shares with each other \*DOES\* require a subscription to ProTools
  - Costs around \$5 to \$10/month depending on use of any special deals (I recommend taking advantage of them)

## Membership

Ancestry Pro Tools **ACTIVE**

Started: March 3, 2025

Renews on: September 3, 2025

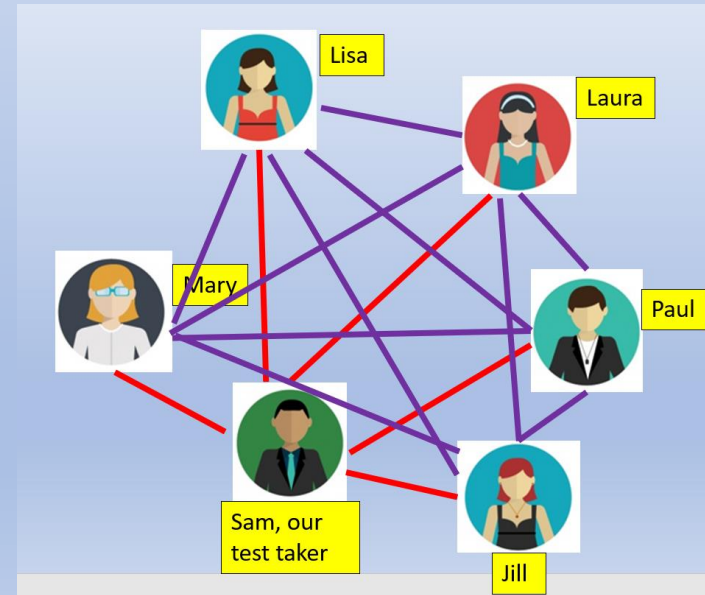
Billing cycle: Semi-annual

Renewal price: \$44.99 / 6-months

MyHeritage does not require a subscription to access this feature however it may require a one-time fee to upgrade the account.

# In Summation...

- Genetic Networks are very useful for:
  - Sorting your matches into ancestral lines
  - Often assisting in determining how you are related to matches
  - Use the feature of comparing how much DNA each of your shared matches share with each other on the 3 testing companies that allow it (Ancestry, MyHeritage, and 23andMe)





Presentations:

<http://familytreeaz.com/Presentations>



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