

Digging Deeper – Hands-on Exercise

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Facts:

1. LD has 1st/2nd cousin matches on Ancestry and FamilyTreeDNA (FTDNA) that she cannot place in her tree.
2. LD and some of these matches have transferred their DNA results to Gedmatch from Ancestry and FTDNA.

Goal: LD wants to establish the relationship between her and the 1st/2nd cousin matches that have no known family connections.

1st/2nd Cousin Matches Compared to LD

Who?	Comparison	From Gedmatch cM >7 cM	Group(s)	Predicted Relationship to LD
PO	PO:LD	1294.7	C	<i>First Cousin (1C) Half Aunt/Uncle/Niece/Nephew Great-Grandparent/Great-Grandchild Great-Aunt/Uncle/Niece/Nephew</i>
V (PO's Mom)	V:LD	13	G, H	<i>Third Cousin (3C) Second Cousin Twice Removed (2C2R) Third Cousin Once Removed (3C1R) Other Distant Cousins</i>
MH	MH:LD	452.6	D	<i>First Cousin Once Removed (1C1R) Half First Cousin (½ 1C) Half Great-Aunt/Uncle/Niece/Nephew</i>
CC	CC:LD	1178.7	C	<i>First Cousin (1C) Half Aunt/Uncle/Niece/Nephew Great-Grandparent/Great-Grandchild Great-Aunt/Uncle/Niece/Nephew</i>

Questions:

1. What is/are the group(s) for each match? (fill in that column)
2. Is the match to PO on his mom's side or his dad's side (circle one)
3. What are the predicted relationships for each match? (fill in that column)
4. What does having a 1st cousin mean? *It means that one of your parents is siblings with one of the parents of your 1st cousin. For example, both of your moms are sisters to each other.*

Note: If it were on his mom's side, his mom would share about twice as much DNA with LD as PO shares with her (which she doesn't)

More facts: On Ancestry, LD tested 2 of her ½-nieces/nephews. They were children of her paternal ½-brother. That is, LD and her ½-brother shared a father, but not a mother.

Test results: Neither of her ½-nieces/nephews showed up on her match list.

From ISOGG website (https://isogg.org/wiki/Cousin_statistics):

Relationship	23andMe	AncestryDNA	Family Tree DNA Family Finder
First cousins	100%	100%	100%
Second cousins	100%	100%	>99%
Third cousins	89.7%	98%	>90%
Fourth cousins	45.9%	71%	>50%
Fifth cousins	14.9%	32%	>10%
Sixth cousins	4.1%	11%	Remote (typically less than 2%) ^[2]
Seventh cousins	1.1	3.2%	
Eighth cousins	0.24	0.91%	
Ninth cousins	0.06%		
Tenth cousins	0.002%		

Questions:

- Looking at the DNA Detectives Table (DDT; another handout), on average, how much DNA should a ½-aunt share with her ½-neice and ½-nephew?
900 cM
- What other relationships share this much DNA? (from the DNA Detectives Table) 1st Cousin (1C)
- Looking at the table above and using a similar type of relationship (from Question 2), what's the probability that LD's ½-niece and ½-nephew would not match her? 0%

4. What does this tell us? *That her ½-niece & ½-nephew are not biologically related to LD.*

Moving On: Let's look at LD's close matches from page 1.

1st/2nd Cousin Matches Compared to Each Other

Comparison	from Gedmatch cM >7 cM	Group(s)	Predicted Relationship to Each Other
MH:CC	1985.5	B	Half Sibling Aunt/Uncle/Niece/Nephew Double First Cousin Grandparent/Grandchild
MH:PO	509.6	D	First Cousin Once Removed (1C1R) Half First Cousin (½ 1C) Half Great-Aunt/Uncle/Niece/Nephew
CC:PO	1021.5	C	First Cousin (1C) Half Aunt/Uncle/Niece/Nephew Great-Grandparent/Great-Grandchild Great-Aunt/Uncle/Niece/Nephew

Questions:

1. What is/are the group(s) for each match? (fill in that column)
2. What are the predicted relationships for each match? (fill in that column)

More facts: One other person from this family (DR) tested at Ancestry back when Ancestry didn't tell you how much DNA you shared. The only thing Ancestry gave you was a predicted relationship. Here's that information.

1st/2nd Cousin Matches Compared to LD with Ancestry Prediction

Comparison	Predicted Relationship
LD:DR	Ancestry says 2C

Questions:

1. Does Ancestry usually over or under predict relationships? (circle one)
2. Based on this tendency, what other relationship could LD & DR be? *The relationships in Group D: 1C1R, ½-1C, ½-Great-Aunt/Uncle/Niece/Nephew*

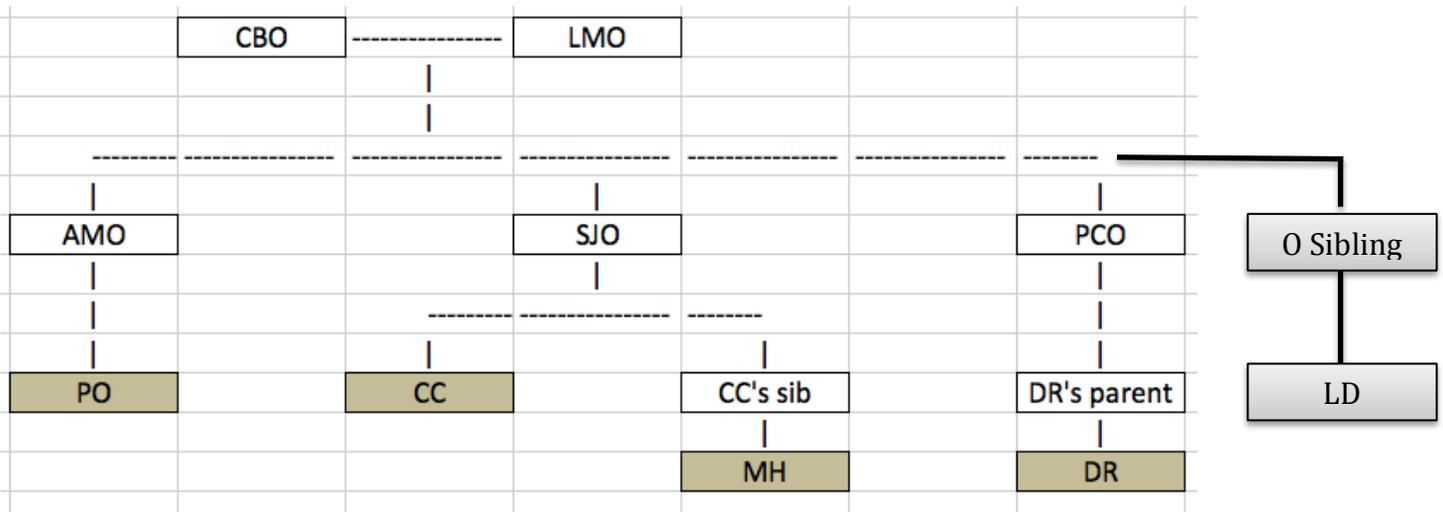
More Facts Regarding The Close Matches:

1. PO's father is AMO,
2. CC's mother is SJO, and
3. AMO and SJO are siblings.
4. DR is the granddaughter of another one of their siblings, PCO.
5. CBO and LMO are the parents of the siblings (AMO, SJO, PCO)

The Matches' Family Tree: Place the following people in the tree:

PO, AMO,
CC, SJO, CC's sib, MH,
 DR, DR'S parent, PCO,
 CBO, and LMO

The people who tested are in grey below and underlined above.



Questions/Review:

1. LD is 1st cousins with both PO and CC.
2. This means that one of LD's parents is a sibling to one of PO's parents and one of CC's parents.
3. Both PO and CC have a parent from the O family.
4. Therefore, since both PO and CC match LD at a 1st cousin level, the O family is a good place to start looking for one of LD's parents.
5. Where does LD belong in the tree? (draw her in above)
6. Should both of her parents need to be examined? Yes/No (circle one)
7. Which of LD's parents should be examined first? Father/Mother (circle one)

More facts about potential birth fathers (BFs):

- CBO and LMO had several sons, who are listed below.
 - All of the sons were born and died in South Carolina with the following exception in parentheses.
1. LDO
 2. HRO
 3. ~~AMO (PO's father)~~
 4. VWO
 5. CBO, Jr.
 6. HHO
 7. ~~PCO (died in Cocoa Beach, Brevard, Florida; also DR's grandfather)~~
 8. EKO

Questions:

1. Can any of these brothers be eliminated as possible BFs? (Yes/No (circle one))
2. Based on DNA, who can be eliminated as possible BFs and why? (cross them off the list above)
 - a. ~~AMO~~ because *he's PO's father. If he were LD's father, LD & PO would be ½ sibs & share ~1,800 cM. However, they're 1st cousins, sharing 1294.7 cM.*
 - b. ~~PCO~~ because *he's DR's grandfather. If he were LD's father, LD & PO would be ½ sibs & share ~1,800 cM. However, they're 1st cousins, sharing 1294.7 cM*

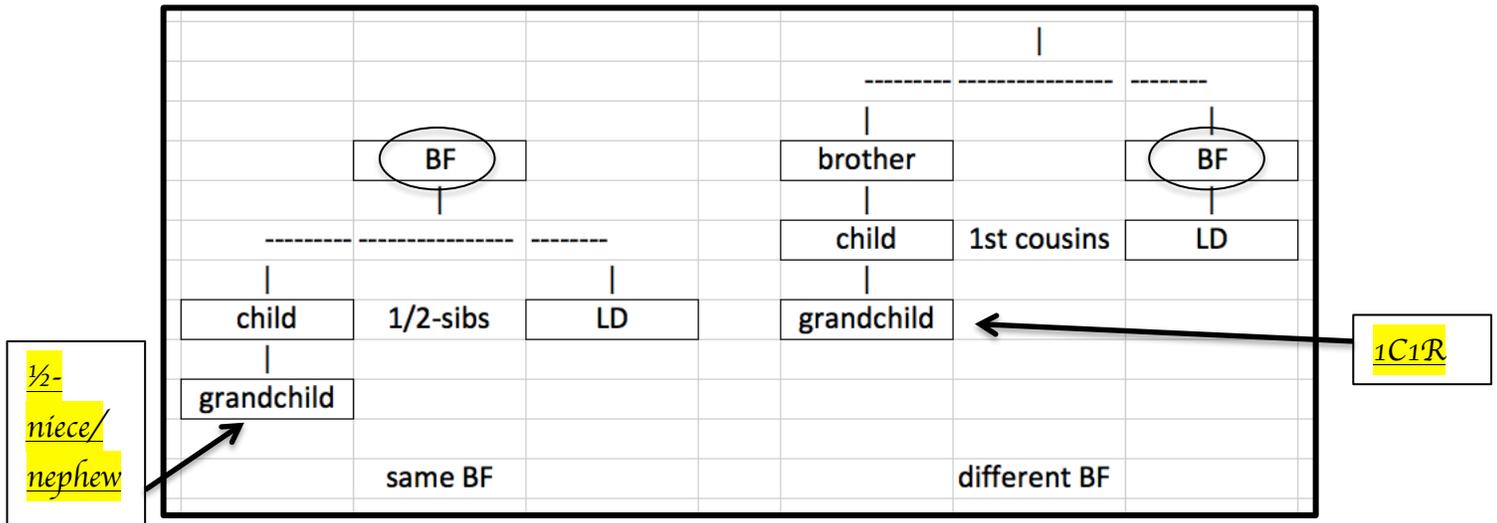
Additional Facts:

- LD's parents traveled extensively in the western and southern parts of the United States. They were married in California.
- As noted above, with one exception (PCO), the brothers all were born and died in South Carolina.
- All brothers are deceased.
- EKO was in the Army and spent some time in California while enlisted.

Questions:

1. Based on other information (not DNA), who is the most likely BF? ~~EKO~~
2. How do we test this theory? *Since EKO is deceased, test one of his offspring.*
3. If we test a brother's offspring, how much DNA sharing should we expect?
 - a. testing a child of a possible BF:
 - i. If the child & LD are ½-siblings (sharing the same BF), they would share an average of 1,800 cM of DNA
 - ii. If child & LD are 1st cousins (not sharing the same BF), they would share an average of 900 cM of DNA
 - b. testing a grandchild of a possible BF:

- i. If the grandchild & LD are 1/2-niece/nephew/aunt (because the grandchild's parent & LD are 1/2-siblings sharing the same BF), the grandchild & LD would share an average of 900 cM of DNA.
- ii. If the grandchild & LD are 1st cousins, once removed (because the grandchild's parent & LD are 1st cousins not sharing the same BF), the grandchild & LD would share an average of 450 cM of DNA



- c. Testing EKO's son resulted in a match to LD of 1,900 cM. What does this tell you? EKO's son & LD are 1/2-sibs, & EKO is the birth father.

DNA Detectives Autosomal Statistics Chart

Created by Christa Stalcup

cM (centimorgans)^		Percentage (%) of Shared DNA^^		Group	Relationship
Average	Range	Average	Range		
1800	1300 - 2300	25%	18%-32%	Group B	Half Sibling Aunt/Uncle/Niece/Nephew Double First Cousin Grandparent/Grandchild
900	575 - 1330	12.5%	8%-18.5%	Group C	First Cousin (1C) Half Aunt/Uncle/Niece/Nephew Great-Grandparent/Great-Grandchild Great-Aunt/Uncle/Niece/Nephew
450	215 - 650	6.25%	3%-9%	Group D	First Cousin Once Removed (1C1R) Half First Cousin (1/2 1C) Half Great-Aunt/Uncle/Niece/Nephew
224	75 - 360	3.125%	1%-5%	Group E	Second Cousin (2C) First Cousin Twice Removed (1C2R) Half First Cousin Once Removed (1/2 1C1R)