Breaking Through Brick Walls with DNA

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Summary:

All family trees have brick walls where we cannot find the next generation. This talk will cover

- when DNA might be the solution—and when it might not be,
- steps to using DNA to break down brick walls, and
- a case study where DNA was used to break down a brick wall.

When DNA Might be the Solution

DNA can be used to break through brick walls. This requires "good" DNA matches and "good family trees. If you're looking for unknown 2nd great grandparents, having 3rd cousin matches will help, as 3rd cousins share great grandparents with you. However, a closer cousin can also help if their tree is built back past the brick wall.

DNA Steps

This is often an iterative process with steps repeated. In general, and to summarize, the following steps are used.

1. Identify your goal
2. Determine type(s) of DNA to use
3. Find person with that DNA
4. Select a company
5. Interpret your results
   a. Create Genetic Network(s)
   b. Predict Matches' Relationships
   c. Review Trees for Common Ancestors
   d. Build Trees Backward
   e. Develop & Test Hypothesis

The Steps in Detail

1. **Identify Your Goal**

If your goal is breaking through a brick wall, then identify where that brick wall is: what line? What ancestor?

2. **Determine type(s) of DNA to use**

You and others who also have this brick wall (and are willing to test) should have their _autosomal DNA tested_. Note that if a brick wall is on a direct patrilineal line, then Y-DNA can also be tested. This talk, and most of my client work, focuses on autosomal DNA.

3. **Find person with that DNA**

If this is a brick wall in your family tree, then you have the autosomal DNA (atDNA) to test. It might help to have siblings test, as their atDNA matches will vary starting at the 3rd cousin level. If your brick wall is on your maternal side, having maternal cousins or aunts/uncles test, will help.

The case study described in this talk is for one person who recruited several family members to DNA test. Don't worry if you're not able to do this. In your match list, you'll likely find people you know. Once you identify them, you'll be able to "use" them to group the matches you share with them. This will allow you to create a "**Genetic Network**" of these groups of matches.

For example, when I first tested, I found a 1st cousin, once removed (1C1R) in my match list. She's my mother's paternal first cousin. I never tested my mother before she died. However, I use this 1C1R as a substitute for my mother to create Genetic Network of maternal matches through my maternal grandfather. Therefore, if I had a brick wall on my maternal grandfather line, I could use this 1C1R to create a Genetic Network

4. **Select a company**

I recommend starting at Ancestry because its database is the largest, it also has useful tools, and many people have family trees associated with their DNA results.

Oftentimes, testing at Ancestry alone will provide enough DNA matches and trees to break through a brick wall. However, other times, the person will need to test at or transfer to other DNA companies and use GEDMatch.com.

5. <u>Interpret your results</u>

a. <u>Create Genetic Networks (GNs)</u>

A GN is a group of matches who are related to each other. They share multiple DNA segments passed down from one or more common ancestor. They are matches who match you and another match. These shared matches are called different things at different DNA testing companies.

- Ancestry: Shared Matches
- FamilyTreeDNA: In-Common With
- 23andMe: Relatives in common
- My Heritage: Shared DNA matches

Ancestry now has a color-coding system for matches. I use this to color-code various GNs.

When examining their trees, remember the most likely relationships. (*This is covered in more detail below.*) For example, for a 2nd cousin match, the tree would be examined for a set of great-grandparents (since that's who 2nd cousins share). Usually, we have 4 sets of great-grandparents. How do you know which one is relevant? Look in the trees of others in the GN to see if one of those 4 couples is there also. Maybe those ancestors aren't there, but the same surname or a common location or ethnicity might help stitch together the trees to find common ancestors.

<u>Clustering Tools</u>: There are two new tools available create GNs from your matches. (1) Genetic Affairs (<u>GeneticAffairs.com</u>) and (2) Collins' Leeds Method available through DNAGedcom Client at <u>DNAGedcom.com</u>. Both create matrices of shared matches to help create and visualize GNs.

b. <u>Predict Matches' Relationships</u>

Next, predict the matches' relationships based on the amount of shared DNA. For this, examine how much DNA is shared with matches. In general, the more DNA that's shared, the closer the relationship is. DNA sharing can be measure in centimorgans (cMs) or percents. A centimorgan (cM) is a measurement of DNA. In general, the more you share, the closer the relationship.

DNA testing companies don't always correctly predict relationships. In general, we see the following.

- Ancestry – underestimates (says relationship is more distant)

- FamilyTreeDNA – overestimates (says relationship is closer)

- 23andMe and MyHeritage – very accurate, but doesn't always list all possibilities

Bottom line: Do it yourself (DIY). The following two tools help with determining possible relationships.

- **Ancestry** has its own tool. Just click on the Shared cM link to find out possible relationships and their probabilities.
- The **Shared cM Project Tool** at https://dnapainter.com/tools/sharedcmv4 lets you input amount of shared DNA. It then outputs possible relationships, along with their probabilities.

Predicting relationships with matches tells which ancestor(s) are likely shared. For example, a 2nd cousin match will share great-grandparents with the test taker. It's important to understand the types of cousins and other relatives. The amount of DNA shared by different relationships varies, as well as the ancestor(s) that will be shared. For example, a half-1st cousin (1/2-1C) will share half as much DNA as a 1C. A ½-1C will only share 1 of 2 grandparents. Find a good reference to explain these relationships, such as Wikipedia's page for cousins.

c. Review Trees for Common Ancestors

Study the trees of the genetic network (GN) for common ancestors, locations, or ethnicities for people in the GN. Sometimes just a surname is initially identified.

Oftentimes, trees of matches must be built or extended. I do this in a working tree on Ancestry that's both private and unsearchable. I put all of the GN trees in one working tree. The branches might not initially be connected, but eventually they hopefully will. *This is not a Mirror Tree.* You can also add DNA matches to your main family tree—it's up to you.

d. Build Trees Backward

Trees of GNs are built *back* in time to find **most recent common ancestor (MRCA)** of the GN and possibly further back. How far back is based on the closeness of the relationships to the test takers.

During this tree building, build out collateral lines for the children of the MRCA— or whatever the relevant generation is. For example, let's say your DNA matches are 2nd cousins sharing a set of great grandparents as their MRCAs. If you're seeking a 2nd -great grandparent, then you would build the GN's tree back 2 generations beyond their

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shared great grandparents to their 3rd great grandparents. Then you'd build down in time to includes all children of their 3rd great grandparents. One of their children is likely you unknown 2nd great grandparent.

e. Develop & Test Hypothesis

Once you have an idea, i.e., hypothesis, about who is behind your brick wall, you should collect additional evidence to test your hypothesis. Does all of the evidence support your hypothesis? Does some evidence contradict it? Can you explain any contradictory evidence?

Bibliography:

ISOGG Table with probabilities you'll match your cousins at same company: https://isogg.org/wiki/Cousin_statistics

DNA Painter's Shared cM Tool: https://dnapainter.com/tools/sharedcmv4

To Get Your **DNA Roadmap** with These Steps And More: https://dnahunters.com/Roadmap

DNA Hunters Society—My business's community where members receive ongoing education and support on using DNA for family research. Trial membership $7 for 7 days. https://dnahunters.com/Society