Are they really my ancestors?

Using autosomal DNA tests to confirm (or deny) relationships and ancestors

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Family lore	The stories of our family, our starting point
Documented (legal) genealogy	The bmd's, census, probate etc. - the legal records that document our genealogy - the paper trail. A legal record may not accurately reflect a genetic relationship (adoption, extra-marital affair etc.)
Genetic genealogy	The shared DNA - the proof of our "relatedness". It needs the paper genealogy to show exactly how people are related.

Genealogists use three types of tests:

- Y Chromosome - males only, traces the male line from father to father to father - provides links centuries back
- mitochondrial (mtDNA) - for both males and females, traces the maternal line (mother's mother's mother etc.) - provides links centuries back
- autosomal DNA - the newest test - examines genetic relationships on all lines of the family - fairly completely for 5 generations and erratically beyond that

This presentation will discuss only the autosomal DNA test. All the examples will be from Family Tree DNA.

Those interested in testing a surrogate (a male of the appropriate surname) for a Y-DNA test, might consider doing an autosomal DNA test first to confirm that the test subject is indeed related as the paper trail indicates.

Testing Companies

- Family Tree DNA (FTDNA) familytreedna.com - tests only for genetic relationships
- 23and Me 23andme.com - tests for health information and for genetic relationships
- Ancestry DNA - tests for genetic relationships - only available to Americans at the present time

There is a lot of explanatory material on the testing companies' websites.

Some people have made striking discoveries using autosomal DNA tests, such as identifying a birth parent for an adoptee. This presentation will not show great breakthroughs but rather the systematic confirmation (or not) of a well-researched family tree.

An autosomal DNA test is another tool to be used alongside the paper records. It can identify that you are genetically related to another person but not precisely how. For closer relatives, the testing company may suggest that two people are: aunt/uncle, niece/nephew or grandparent/grandchild based on the fact that the two people share approximately 25% of their DNA (see sample at the end).. For more distant relatives it may suggest a range of 3rd -5th cousin, probably 4th cousin. The real relationship might be 3rd cousin once removed, or something outside the range.

For statistics on how much DNA you share with different relatives see:
http://www.isogg.org/wiki/Autosomal_DNA_statistics

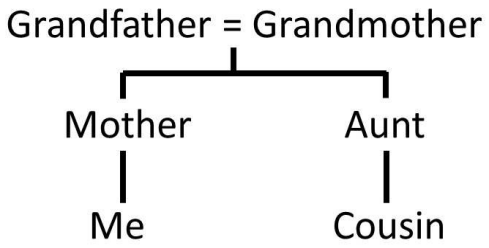
Passive researcher - takes a test and then waits for others to check results and to contact him.

Active researcher - loads a GEDCOM (to produce a pedigree chart) and adds additional surnames to the list. The active researcher checks regularly for new matches and contacts people when the pedigree chart links to a time and place (if not a name) of common ancestors.

Most importantly - persuades other family members to be tested as well so that a triangulation can be done on the matches. Matches shared by a known relative will indicate what family line the new "genetic cousin" is related on.

The most important people to test are older relatives as more of their DNA is relevant to you. You only share 25% of your DNA with a biological aunt or uncle, but all their genetic matches are of interest to you because they are based on DNA that your aunt or uncle inherited from your grandparents.

Confirming a Relationship
A match with a 1st cousin (in the appropriate range) confirms that you are related through a set of grandparents. Any matches that you have "in common" with this cousin will on the ancestral line of one of these grandparents.



(The common ancestors of my cousin and me.)

How to do you persuade people to be tested?
Consider going through an intermediary. For parental cousins whom I had never met, my mother made the first contact. They co-operated as a favour to her. For an elderly relative in a nursing home, I went through her daughter.

For an elderly relative and anyone not actively involved in genealogical research, expect to pay for the test yourself.

Ethical Aspects
In testing a known relative, thought should be given to the possibility that there will be a non-match. How will you and the other person handle this information?

Probability of Matching
Family Tree DNA defines the probability of matching:

Relationship	Match Probability
2nd cousin or closer	>99%
3rd cousin	>90%
4th cousin	>50%
5th cousin	>10%
6th cousin or more remote	Remote (typically less than 2%)

http://www.familytreedna.com/faq/answers.aspx?id=17#628

A 3rd cousin matched with me (the probability was 90%). He did not match with my 1st cousin (another of his 3rd cousins) but he did match with my first cousin's mother. Beyond the second cousin level, test more than one family member before assuming that there is no genetic connection to a particular family.

Genetic Genealogy blogs
http://www.dnaexplain.com/ - Roberta Estes
http://www.yourgeneticgenealogist.com/- Cece Moore

Information about autosomal DNA
http://www.smgf.org/education/animations/autosomal.jspx

Making Contact
Family Tree DNA will provide email contact information for your genetic matches. The email address may not be that of the person tested as many researchers, like me, manage many kits. When writing to a contact, it is helpful to name the people who match rather than saying "I match you".

If you test at 23andMe, you have to request the sharing of contact information and genetic data through the company web site. You can, however, load 23andMe data on to the Family Tree DNA site for additional matching ($69).

Prices for Autosomal DNA Tests on August 10, 2013 (U.S. Dollars)
Family Tree DNA - $99 plus $7 shipping (you pay return postage)
23and Me - $99 plus $59.95 return shipping

Reviewing one's matches

On the dark bar:

"Genealogical matches based on DNA" is supplied by FTNDA. It bases the suggested relationship on the shared centiMorgans (cM) [i.e. the amount of shared autosomal DNA] and on the longest block of continuous DNA. The longer the blocks of matching DNA, the closer the genetic relationship between two people is likely to be. The computer sorts on the "longest block" but you can change to another field.

"Known Genealogy" - The known relationship and ancestral surnames are supplied by the person being tested (or handling the management of the kit).

There are various tools for analysing your matches:

- "in common with" one of your matches
- "not in common with" one of your matches - The matches that I do not share with my mother would be on my father's side
- chromosome browser - to graphically illustrate how you match on different chromosomes with up to 5 of your matches
- population finder - to show your ethnic make-up. This is still in beta version and subject to change
- download raw date - to analyse in a spreadsheet or upload to another utility such as GEDMATCH www.gedmatch.com