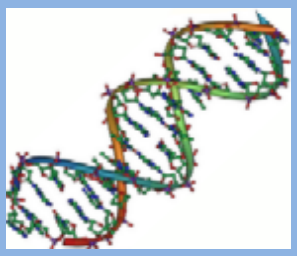

Phillips DNA News

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Please submit news articles or ideas for articles to the editor. Questions about Genetic Genealogy can always be sent to the editor.

Project News

It's the Merry Month of May! Happy May Day, Mother's Day and Memorial Day!

There has been a lot of buzz lately about a new kind of DNA testing for genealogy called autosomal or atDNA testing. A company named 23andMe, whose co-founder Anne Wojcicki is the wife of Google co-founder Sergey Brin, has been offering atDNA testing for about one year now. Talk about a power couple! Recently, Family Tree DNA decided to get into the game and announced its new autosomal test called Family Finder.

We have been inundated with questions about autosomal DNA tests, so here is a basic primer on the subject of DNA. Humans have 23 pairs of chromosomes (hence the name 23andMe) or a total of 46 chromosomes. The first 22 pairs are called autosomes and the final pair is made up of the two sex chromosomes, X and Y. If you have two X chromosomes, you are a female. If you have one X and one Y chromosome, you are a male.

Most of you are familiar with yDNA testing, which can only be done on a man, because women do not have a Y chromosome. Y-DNA testing is very useful for genealogy purposes because the Y chromosome is passed down from father to son over the generations, hand in hand with the surname. Y-DNA testing is also effective because yDNA usually does not combine with any other DNA. This means the yDNA a man receives from his father is nearly identical to the yDNA his father received from his father and so forth back in time.

Many people think mitochondrial DNA (mtDNA) testing involves the X chromosome, but it does not. Mitochondrial DNA is not located on a chromosome. It is found in the nucleus of the cell and it is contributed to the embryo by means of the mother's egg. Like yDNA, mtDNA does not combine with other DNA, so it is useful for tracking the direct maternal line back in time. However, because mtDNA mutates very, very slowly, it is more informative for anthropology than it is for genealogy. Your mtDNA is identical with the mtDNA of your "clan mother" who existed thousands of years ago.

With regard to the DNA found on the 22 pairs of autosomes, the situation is much more complicated. It is difficult to differentiate which atDNA came from which parent because of a process called recombination. Autosomal DNA is made up of many random combinations of genetic blocks of information inherited from the father and mother. Because atDNA combines randomly, some atDNA may be inherited in larger quantities than other atDNA. For example,

son may inherit more atDNA from his mother than from his father. Here is a link to a chart on our website that tries to illustrate the random nature of atDNA recombination: http://www.phillipsdnaproject.com/faq-sections/27-dna-questions-faqs/316-atDNA-in-depth

The new autosomal DNA tests work by comparing your atDNA with other people's atDNA to see if you share any identical blocks or segments of atDNA. If two people share identical blocks or segments of atDNA, then they may share a recent common ancestor, although the atDNA alone cannot tell them the name of that common ancestor. When a matching segment is found, the scientists use statistical methods to determine if the segments are Identical By Descent (IBD). If they are determined to be IBD, then the scientists try to calculate the degree of relationship based on the size and number of shared segments.

However, because of the random, hit-or-miss nature of atDNA inheritance, it is quite possible that you will share no detectable atDNA with a distant cousin. Here is FTDNA's explanation of this phenomenon: atDNA is passed on randomly each generation due to recombination. A child inherits approximately 50% of his or her atDNA from each parent. Each parent in turn inherited approximately 50% of their atDNA from the child's grandparents. Due to random recombination, a child may not inherit exactly 25% of his or her atDNA from each grandparent. While it is unlikely that a child will inherit no atDNA at all from one of his or her grandparents, this becomes increasingly more possible in more distant relationships.

Additionally, in order to be identified as a match, you must have inherited some of the same segments of atDNA from your common ancestor. The more distantly related your relative is to you, the more possible it is that you and your relative will not inherit the same segment of atDNA from your common ancestor. Because of this, you may discover that you do not share a detectable amount of atDNA with a traditionally documented 4th cousin, yet you do share some atDNA with more distantly related 5th to 8th cousins.

Here are the amounts of atDNA you can expect to share with different relatives. Keep in mind that these are average figures. Since the amount of each grandparent's atDNA passed on to you is random, the amount of atDNA shared with a particular cousin may be much more or much less:

Sibling: 50%
First Cousin: 12.5%
Second Cousin: 3.125%
Third Cousin: 0.781%
Fourth Cousin: 0.195%
Fifth Cousin: 0.049%

So what does all this mean? If you are related within five generations (3rd or more recent cousins), atDNA testing is likely to detect your relationship. Testing will also detect some 4th

and 5th cousins and a small percentage of more distant cousins. Here are your odds of finding a match through atDNA testing, according to FTDNA:

Relationship	Match Probability
2nd cousins or closer	> 99%
3rd cousin	> 90%
4th cousin	> 50%
5th cousin	> 10%
6th cousin and more distant	remote (typically less than a few percent)

Questions and Answers

Question: At first glance the new autosomal test offered by FTDNA sounds interesting. If the $289 cost were shared by all Group 9 members for the testing of only one of the members, would it be of benefit in locating any info on our Most Distant Ancestor?

Answer: Probably not. Autosomal testing can only reliably identify relatedness going back about five generations.

Question: What I think of proposing to our Phillips family researchers is that one of our Group 9 should have the new test done. Whatever those results are would most likely apply to all others in the group. Thus all the members of the group would agree to equally share the cost of the analysis. I am aware that the results will not take us back very far, but the results should find more kin as related to the DNA database. Then those kin would lead to good targets for DNA analysis and one of them might have a family bible or other document related to the origins of our earliest known ancestor.

Answer: Unfortunately, that probably won't work for several reasons. First, this is a brand new test so the number of people who have taken it is very small and as you know, matches are dependent on the size of the database. Second, your atDNA is going to be different from the atDNA of everyone else in Group 9, because except for your Phillips line, your ancestors are not all the same. Everyone's atDNA is very unique and individualistic. I took the 23andMe atDNA test and I have over 300 matches in their database of 35,000 people. However, thus far it has been impossible to link any of my matches with the surnames in my family tree. In other words, it is very difficult to determine which segment of atDNA goes with which surname.

Question: I guess I will jump in here. Keeping in mind, I am not the Phillips - my husband is - I recently took the 23andMe atDNA test, too. I was disappointed because I am quite sure I have a little Native American blood and it said zero! Also, so far, I only have 2 matches but back 150-250 years. Neither surname is one which I think I could ever connect up with on paper. So I have mixed feelings about doing the new test - but you never know what contacts might eventually be made. Should I take the Family Finder test offered by FTDNA?

Answer: I would recommend that you do not take the new autosomal test being offered by FTDNA if you have already been tested by 23andMe. FTDNA announced that, in the near future, you will be able to upload your results from 23andMe to FTDNA for $40. That is a lot cheaper than $289!

Also, while we are on the subject, I want to mention that the new autosomal test being offered by FTDNA is cheaper than the 23andMe autosomal test, but not as comprehensive. For example, the FTDNA test does not give you an estimate of your ethnic heritage. Also, the FTDNA Family Finder test does not test your X chromosome or offer any medical information.

So my advice to anyone who wants to take an autosomal DNA test is to consider taking the one offered by 23andMe and then upload your results to FTDNA for $40. This will give you exposure to two databases for possible matches, as well as information on your ethnic heritage and medical traits.

Question from Lawrence Mayka on the Rootsweb DNA Mail List: As members of the Polish Project begin getting results from their Family Finder (FF) orders at FTDNA, I am repeatedly getting the same question I knew I would get from own experience with 23andMe's Relative Finder (RF): "I'm Polish Catholic. Why are my only FF matches British Isles or Ashkenazi Jewish?"

Answer from Lawrence Mayka on the Rootsweb DNA Mail List: Of course, we on this mailing list know the answer, because we've been through this before. FTDNA specifically advertises FF only to the level of 3rd cousin. Any "matches" beyond that level are like 12-marker yDNA matches, or worse: they are like HVR1 mtDNA matches. They are basically meaningless, at least for our ethnic group. FF is "detecting" inheritance from many hundreds, and perhaps a couple thousand, years ago. I am glad that FF, unlike RF, at least labels anything beyond 3rd cousin as "speculative." If my project members had read FTDNA's advertising carefully and thought about its consequences, they would have realized something obvious: for a typical Polish-American, the number of undiscovered relatives (3rd cousin or closer) who are going to purchase FF any time soon is...zero. As others on this list have pointed out, the best use of FF is to verify an already suspected close biological relationship.

Featured Family Story

Tracing my Ancestors with YDNA Help, Part II

By Roger Phillips, Phillips Family Group 1

In a previous account, I wrote about using yDNA to confirm my direct descent from a Thomas Phillips (1720-63) who ran a pub and gin distillery in Southwark, now a part of greater London. That account is posted on our Phillips DNA Project at this link: http://www.phillipsdnaproject.com/the-community/success-in-the-project/121-roger-phillips-success.

More recently, I decided to see if there were any living descendants of my great great grandfather John Richardson Phillips that I could contact – those of my generation, if there were any, would be fourth cousins. From family records and the IGI, I had established he had four brothers of whom one died as an infant and another drowned as an unmarried young man.

A third brother, a James Phillips, led me a merry chase and using internet searches I found him becoming a Mormon in England and then wending his way to Salt Lake City where he acquired two wives, split up with one, apparently was thrown out of the LDS church, moved to Oakland, California, where he died still living with one of his wives. But unfortunately he had no children by either wife.

That left his eldest sibling, another Thomas Phillips born in 1814. After a few false starts, I obtained his correct marriage certificate and, armed with his wife's name, located the family in the 1861 English census showing children born in India. That took me to the British Library which has an extensive set of birth records for births in the 19th century to British parents.

It turned out Thomas had gone to India as a missionary shortly after his marriage and I gleaned quite a bit of information on his missionary activities from records in the Regents' College library at Oxford University, including his return to England in 1854. But, for the births of his children, it was the British Library that gave me their birth dates, fitting with the ages of those found in the 1861 census. The bad news was that two of his children (John and Jane) died unmarried in a typhoid epidemic in England and a third child Charlotte married well after child bearing age. Looked as if I had hit another dead end!

Then I noticed a Phillips grandchild of Thomas's widow staying with her in England in the 1881 census and recorded as having been born in India about 1871. This granddaughter could not have been the child of John who had moved to England with his parents in the 1850's. I reasoned that there was possibly an older son of Thomas who had stayed in India and went back to the British Library records. Sure enough I discovered an older boy named James Pengelly Phillips being born to a Thomas Phillips. Now the marriage certificate for Thomas and his wife Charlotte previously mentioned showed the officiating clergyman was surnamed "Pengilly". Was this a coincidence? I located a marriage in India for this James and quite a few offspring including the granddaughter who had visited England in 1881.

Interestingly, James Pengelly Phillips had given all of his sons the middle name Pengelly and in their subsequent marriages I discovered in India they had morphed their surnames to "Pengelly-Phillips". Reasoning that eventually all or some of the family's descendants might have settled back in England, I scoured the British General Register Office (GRO) Indices on Ancestry.com and a British website called "Tracesmart" as well as Google and wills at London's Principal Probate Registry.

It soon became apparent that all the Pengelly-Phillips's in the world were my cousins provided I could definitely prove that the James Pengelly Phillips whose birth I discovered in India in the 1800's was indeed the son of my Thomas Phillips of 1814. I located a Pengelly-Phillips male who by the tree I had developed should have been my fourth cousin. He agreed to a yDNA test with Family Tree DNA and eureka, we matched 35 out of 37 markers and all of the first 12!

I now have an almost complete record of the descendants of my great great grandfather's brother as with a few contacts with living descendants I gleaned the information needed to fill in any gaps I had, save for one exception: neither a fourth cousin Cheryl Gaye Pengelly-Phillips, born in Lahore in 1949, to Richard Eric Austin Pengelly-Phillips and his wife Yvonne Ninette, nor her parents can be located after 1949.

Guest Column

Divided By The Pond: Why Genetic Drift Means US Results Can't Pinpoint the Origin of a British Surname *By Chris Pomery*

Like so many great technological innovations, the use of Y-chromosome DNA testing to unravel the history of a surname was invented in Britain…and commercialized in the USA.

Since the very first published surname project, on the Sykes surname back in the year 2000, the number of Y-chromosome test results has risen to several hundreds of thousands worldwide. FTDNA alone has 165,000 in its database, many within the more than 5,500 surname-based projects registered on its site. In just over a decade we've gone from one surname project to a point where a significant percentage of surnames of Western European origin are included within a registered DNA project. And more are being created every day.

I've no statistics to prove this next statement, but my guess is that over three-quarters of those Y-chromosome results have been gathered from men who live in the USA. A number will also live in Canada and other parts of the Americas, others in former British colonies like Australia and New Zealand. A relatively small percentage will reside in Europe and many of them in the UK or Ireland.

Why is this important? After all, your DNA is your DNA and your surname is your surname. Surely the significance of your DNA result doesn't depend on where you live?

Well, it turns out that it does. It all depends on what question you are asking the data in your DNA project to solve.

The standard question asked of surname-group DNA data is: will it pinpoint some genetic families for us? In other words, will it help us link together groups of men with the same surname and with a common ancestor, and to help us identify that man who, if we could perfectly document it, would appear at the top of their shared family tree?

In this exercise the origin of the people taking the test doesn't matter. In fact, one of the key benefits within a surname DNA group is precisely the discovery of links between individuals, some living in the UK and some outside of it, based upon a shared DNA signature. One can infer that those living outside the UK have an emigrant from the UK as their ancestor, and the DNA result can often point clearly to a specific UK connection, one out of many, which potentially can save years of research time in a bid to document it.

This same matching process is underway within each country as well as between them. In other words, the DNA matching process will create linkages between name bearers living in the USA and name bearers living in the British Isles, as well as among them all, regardless of where they live. If you live in the USA and have only been able to trace your surname lineage back to around 1840, then finding a DNA match with two other name bearers who can trace their lines back to a century earlier, and to specific east coast colonies, marks a considerable advance for you, no doubt about it.

Similarly in the UK, if you've been able to trace your line back to a sixty-year old London-born man in the first national census of 1841, realizing that London is a location people tended to migrate towards rather than away from, then finding a DNA match with two other men who can trace their line several generations further back and to a specific geographical area such as Devon in the West Country or Yorkshire in the north east of England, is a discovery that represents a considerable advance.

All of the above examples are answers to the same simple question: who else with my name do I appear to be related to? The origin of the man taking the test only becomes an issue when one tries to ask more complex questions of the result data.

Two of the most common questions a project will start off with are: firstly, does my surname have a single person at its head, a single ancestor who took on the surname and in a sense started it off? And secondly, which DNA result belongs to that original ancestor?

Let's suppose one neglects to label any of the DNA results within the surname group at all, and treats all results equally the same. In a group of, say, 30 individuals, one particular DNA signature might stand out from the rest because it has been recorded in 21 out of those 30 results. One might be tempted to say straightaway that such a strong modal result (the modal

result is the one recorded the most times within the group) indicates not only that there is a single common ancestor for the surname but that this result is his DNA signature.

That looks pretty straightforward. But then let's say that of those 30 results, five are from men living in the UK, three live in Canada, and the other 22 all live in the USA. And let's then say that the 21 DNA results that are identical are made up of one Canadian and twenty Americans. And just to add a bit more detail, that of the five Britons, two have the same DNA result whilst the other three each have a unique result not found in any of the other 29 individuals.

With this additional detail, purely by including into the analysis the country of residence of the test participant, the inferences from the data look remarkably different. Now we're looking at a surname with one DNA signature held by two Britons, three other unique DNA signatures held by Britons, one DNA signature held by the majority of North Americans, and four other DNA results held by the remaining two Canadians and two Americans. Even without knowing any detail about their research or the trees they've recreated, the residence information has created a completely fresh context to view the group's DNA results.

With this new layer of detail on board, we can hypothesise a new idea: that most of the name-bearers in the USA stem from a single immigrant. One other feature about this pattern of results might strike us: that this dominant result in the USA has not been found among the UK men tested. So the question that this begs is: does this DNA signature no longer exist in the UK population, or is it that not enough name bearers in the UK have yet been tested?

The answer could be either, but I suspect it is much more likely to be the latter. The kind of pattern of results that I've described above, I think, is a feature of a great many Y-chromosome surname projects that have a majority of participants resident in the USA. These are good projects for finding connections within the USA; but, in order to get beyond the simple process of matching results, they do need to build up a matrix of results from name bearers in the UK (or whichever the origin country is).

Some readers might object that my example is biased or unusual. Surely it's unlikely that twenty out of 22 Americans will have the same DNA result? I haven't taken these figures from my own Pomeroy project for the simple reason that we stopped encouraging our men to test some time ago. The reason was that virtually everyone who resides in the USA and who has been DNA tested has the same DNA signature result. We're fortunate that this particular family is very well-documented indeed in a three-volume history written a century ago, so we already know who their common ancestor is and when he emigrated to Massachusetts. What we didn't know before we started collecting DNA results was how rare other families appear to be in the USA.

There's a straightforward explanation for this: there's a difference between the two countries in reproductive success. Put simply, that emigrant in the 1630s had several sons, who had several sons, the ensuring conditions in the USA allowing the family and the surname to expand

very rapidly. Geneticists call this process genetic drift. I've not collected any statistics from other surname projects to prove this point empirically, though I have seen a very similar pattern in a surname with a strong Irish connection. I expect that it holds true for all surname groups. Certainly, today there are many more Pomeroys alive in the USA than in the UK, even though the name has existed for twice as long on the European side of "the pond."

What's the moral of this piece? Firstly, don't be afraid to add in contextual data to augment your DNA results: you need it! When unraveling the origins of a surname, every bit of data is useful. And here's the second observation: as any surname project develops, it will inevitably want to test more Brits. The origin of the surname almost certainly lies in the matrix of project results from the home country, as do the origins of those emigrants who grew their families so successfully in the USA and elsewhere. This is the genetic equivalent of Churchill's special relationship. To get to the bottom of our questions about origins and emigrants, Americans and Brits just can't do without each other.

Biography & Disclosure

This article originally appeared on Dick Eastman's Plus Edition blog at www.eogn.com on 23 September 2009. Chris Pomery is an historian based in Yorkshire, England. Chris has run the Pomeroy DNA project since its inception in 2000. He has published two books on DNA testing with the imprint of The National Archives in London, lectures regularly on DNA testing and surname reconstruction, and now advises Family Tree DNA and promotes the firm in the UK.