

Because in our society families are organized by surname, and because surnames run with male lines, every serious family historian needs to be aware of what DNA testing of males can do for them, and what it cannot.

Let us begin with a question that all genealogists have entertained, and for which we are just beginning to get some scientific answers:

What are the odds that two men with the same surname are related by blood?

The first significant study concerned primarily with this question was published recently by two Brits, Turi E. King and Mark A. Jobling.^[1] This study is based on a randomly selected sample of 1678 male British volunteers bearing 40 different British surnames. It was found that about 40% of each surname sample were cousins—related both by surname and by blood through a common patriarchal ancestor who lived perhaps 600 years ago.

This is an extraordinarily interesting and important finding for genealogists, because it shows how likely it is that two men living today who bear the same surname, and ethnic roots, are also related by blood—are members of the same [patrilineage](#).^[2] This finding ought to act as a stimulus to genealogists to cast their research nets much more widely than they are used to, to encompass the whole deep-rooted patrilineage of the surnames they are researching and not just their own particular ancestral lines.

The second point I would like to make about this study is that it is based on the same kind of yDNA testing that is now available and affordable to all of us. In fact the tests that we can order for \$100-200 from a number of different testing companies are far superior in their discriminatory power to the tests these scientists used in arriving at their broad conclusions. The better tests, like the FTDNA 37-marker test, can in most cases tell us for sure which surname patrilineage each tested male belongs to, even if his surname line has been interrupted by an [NPE](#)—a divergence between the presumed father and the biological father.

It is important to emphasize at this point, that these yDNA tests are no substitute for genealogical research, and indeed they have only a very limited ability to tell us what *branch* of the patrilineage our ancestors belonged to, or just how closely two men are related, but once enough patrilineage cousins have been tested, and have shared their research, there is a good chance that interested researchers will end up pointed in the right direction for the conventional pick-and-shovel research.

Why Testing Males Can be Used to Track Their Surname Ancestry

Testing the male yChromosome (yDNA) can be used to track a man's surname ancestry deep into the past because this chromosome is passed down virtually unchanged from father to son, from generation to generation. However, like all DNA, the yChromosome is subject each generation to a small chance of mutation, so that over a number of generation, subtle (but benign) changes are likely to accumulate, and it is these changes that the yDNA tests pick up. If it weren't for the possibility of mutation, all males would have the same yChromosome as the original yAdam and testing would tell us nothing. As it is, mutation at any given "marker" we might test is very rare—once every several

¹ ["Founders, drift and infidelity: the relationship between Y chromosome diversity and patrilineal surnames"](#), Turi E. King and Mark A. Jobling *Mol Biol Evol.* 2009 May; 26(5): 1093-1102

² I have performed supplementary analyses of three of the American-centric FTDNA surname projects, for a common surname (Perkins), and two ultra-common names (Phillips, and Walker) and confirmed the preliminary finding in K&J that the % in the largest cluster falls off markedly to the single digits, but still the overall % in one cluster of two or more remains high, so that the odds favor a match to at least one other testee, and as more people test and more results accumulate, most unmatched singletons should eventually match to someone else of the same surname. For more on surnames and their origins, see [my Surnames webpage](#).

hundred generations—so that we need to test many marker sites to be able to uniquely identify the patrilineage each man belongs to. Each of the available yDNA tests, offered by a number of different testing companies, checks a particular set of markers on the yChromosome, and the set of resulting test values is called a “[haplotype](#)”. It should be noted that because these marker panels vary from company to company, and aren’t fully comparable from one to the other, it matters which company you test with, and which test you take, or sponsor.

The most popular test today, offered by the testing company FTDNA, tests 37 such markers on the yChromosome, and the odds are that one of these will mutate every 5 generations or so. Because this test is sufficiently sensitive to mutation, it is likely that remote cousins of the same patrilineage will have slightly different yDNA, and furthermore, that the particular pattern of differences between them will serve as as identifiers for their particular sublineages within their common patrilineage. The estimates of their degree of relatedness, [TMRCA](#) (Time back to Most Recent Common Ancestor), and [GD](#) (Genetic Distance), are also calculated from the particular pattern of differences between their haplotypes.

With enough test results for a patrilineage, we may begin to construct a genetic tree that corresponds with the tree of descent we are trying to work out through conventional research methods, and the burgeoning genetic tree can be used to guide us in our conventional, “paper trail” research.

In summary, yDNA testing can provide:

- (1) conclusive proof all by itself that two men of the same surname are not related by blood within historical time;
- (2) strong, but not quite conclusive evidence that two men descend through the male line from the same male surname ancestor, regardless of their own surname; it can also provide a rough estimate of when that ancestor lived, accurate most of the time to within 100 years either way;
- (3) conditional evidence that pairs, or subsets, of these patrilineal cousins belong to a particular family branch (i.e. they share a common ancestor much closer to the present than the patriarchal ancestor of all descendants of the patrilineage, who may have lived 600 or more years ago; this more discriminative yDNA evidence can only arise, though, where (a) many distantly-related patrilineal male cousins have been tested; and where (b) extensive and solid research has been done on all branches of this patrilineage.

Getting Involved

I have deliberately avoided here most of the scientific and technical specifics that characterize these tests, because I mean to address her those neophytes who have been dragging their feet in this area. As a gesture of sympathy with them, I hereby confess that I myself was not one of the “early adopters” in this field, even though I have a technological background and am not deterred by complexity. But it is truly time for all serious genealogists to embrace this powerful technology, not blindly but with the open eyes necessary to see that it is no panacea or substitute for conventional genealogy, but rather a matter-of-course adjunct to it, valuable just in proportion to the quality and quantity of the research done in the conventional ways.

To those who wish to learn more about the possibilities for FTDNA surname projects, I suggest a close look at the [DENNISON DNA Project](#), of which I am the project administrator, and for those

who do like to delve into the foundations of things, there is a great deal of more technical material, mixed with opinions and conjectures, on [my DNA webpage](#).

As for test recommendations, that is easy: I recommend that anyone just getting into this take the FTDNA 37-marker test, or find a male relative with the right surname to take it for them, as their surrogate. This test can currently be ordered from FTDNA through the surname project corresponding to the male who is to be tested, for \$149, and there have been frequent sales that have dropped the price to \$119. [Here](#) is a link to the FTDNA page where you may search for, and join one of the almost 6,000 FTDNA surname projects by ordering this test.

And for those who have already tested at other companies, like Ancestry, I strongly recommend that you upgrade to the FTDNA-37 test, and join an FTDNA surname project, for a whole host of reasons, starting with the fact that FTDNA-37 is a far more sensitive and discriminating test of ancestry. Those who have tested at most other companies, including Ancestry, can order the FTDNA-37 upgrade for the special price of \$119 by printing out and sending in [this form](#).