

Managing a DNA Project

Megan Smolenyak Smolenyak advises on how to organize a test of your genetic genealogy.

YOU'VE PROBABLY BEEN hearing about it for two or three years now — genetic genealogy (what I like to call “genetealogy”), DNA testing done for the purpose of learning about one’s heritage. And since there are now an estimated 600-800 surname projects underway, there’s even a reasonable chance that you’ve been contacted to participate. Or perhaps curiosity has gotten the best of you and you’ve started pondering whether DNA testing could help break down that stubborn brick-wall in your own research.

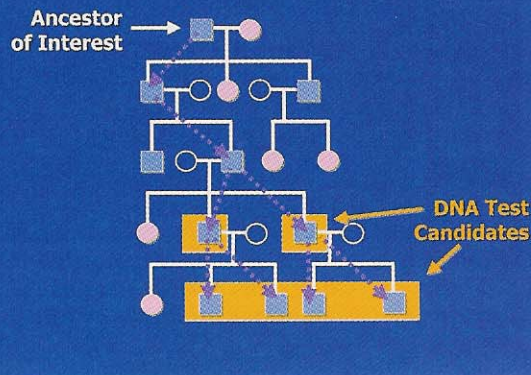
As DNA testing continues to inch its way into the genealogical mainstream, more and more people are considering taking their first steps, but little guidance is yet available. Aside from surfing the websites of existing projects (see Kevin Duerinck’s Surname DNA Projects at www.duerinck.com/surname.html for a list of links), how does one learn what’s involved in managing such a project? This article will cover the fundamentals to help you decide whether it’s time for you to join the community of genetealogists.

What It Is and What It Isn’t

Before launching a project, it’s important to understand that genetic genealogy is a complement to — not a substitute for — traditional genealogical research and is mostly used for surname studies to determine if people share a common ancestor. Contrary to some misconceptions, it is not a short-cut to your family history, a means to learn about your *entire* family tree, a way to answer medical questions or genealogical cheating.

Genetealogy is most useful for learning if participants have common origins, confirming or uncovering connections the paper trail falls shy of establishing, solving personal history mysteries (espe-

Following the Y Chromosome



Tests involving tracing the Y-chromosome are the most established and popular type.

cially uncertain parentage) and saving time and effort in future research. While examples of most of these will be sprinkled throughout this article, it is suggested that the reader see “What’s Next in the World of DNA Testing?” in the November/December 2002 issue of *Family Chronicle* for specific examples of personal history mystery applications.

The Process

The overall project management process can be simplified to four steps: defining the purpose, selecting the test and vendor, recruiting participants and reporting and maintaining the project. It may be that you have one straightforward question to answer and will stop after one round, but most find that an initial taste whets the appetite for more. More than likely, you will find yourself tempted to press on past the last step back to the first in the hope of obtaining more insight or tackling a different genealogical riddle. The majority of current projects are on-going ones in which the manager repeatedly cycles through this process.

1. Define the Purpose

Just as with any other scientific endeavor, the first step in

genetealogy is developing a hypothesis to test. This may sound obvious, but the pioneering aspect of this technology sometimes attracts gung-ho newbies who get tested only to find themselves looking at a jumble of numbers and wondering what it all means. Don’t make the mistake of testing in the hope of stumbling onto something interesting!

For purposes of simplicity, we’ll divide possible objectives into two categories: those associated with Y-chromosome testing and

all others. The most established and popular type is undoubtedly Y-chromosome testing. Y-DNA is passed from father to son down through the generations, corresponding to the uppermost line in a pedigree chart. A given line ends when a male dies without issue or only has daughters, but there are generally other lines in an extended family in which that particular Y-DNA continues to exist. Women can participate, but need to find a male proxy (e.g., father, brother, uncle, paternal male cousin, etc.) to actually provide the sample.

Typical objectives for Y-chromosome projects include:

- Determining if two families with the same surname but living in different regions share a common ancestor
- Testing a theory about an unclear paternity event — e.g., Could X have been the father of orphan Y or illegitimate Z?
- Ascertaining if all people with a given surname have common roots or attempting to divvy them into geographical or other clusters

Though less common at this point, possible objectives of non-Y-DNA projects might be:

- Seeking corroboration for the Native American story in the family

- Discovering what percentage European, East Asian, African and Native American one is
- Learning about one's African origins
- Identifying historical/degraded remains

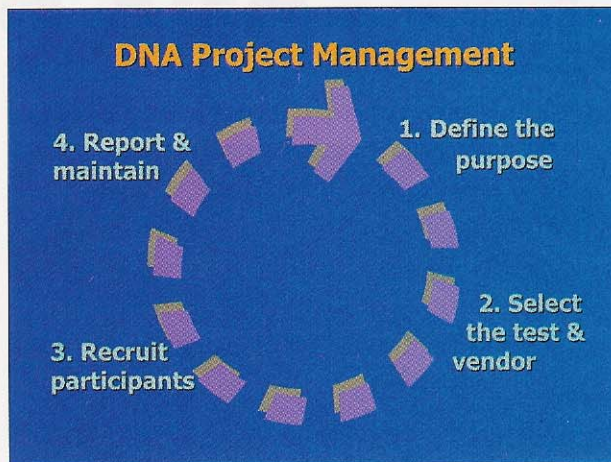
After you've developed your theory, be sure to ask yourself one question: Do I really want to know? A surprising number of people have been rather startled to have their theories disproved! For instance, I once assumed that all people with my surname —

Smolenyak — shared a common ancestor since the name is only found in a single Eastern European village and the four families that have it have lived within a dozen houses of each other for centuries. Wrong. None of the four families match. I actually found this a positive development as this knowledge will save me from decades of trying to prove a false theory, but some may be disappointed when their long-held beliefs are obliterated or at least weakened by the scientific evidence.

2. Select the Test and Vendor

I have combined the selection of both tests and vendor into one step because the two are inextricably intertwined. The objective you set in the first step will determine the appropriate test, and most tests are only available from one to four vendors. If you anticipate using several types of tests over time, you'll want to factor this into your initial decision because migrating a project from one company to another can involve a great deal of effort and cost. Also, group discounts (usually triggered by the participation of six individuals) make it more cost-effective to give all or the bulk of your business to one firm.

In addition to Y-chromosome testing, one can also obtain mtDNA, BioGeographical or ethnic (i.e., African, Cohanim, Native American and Viking) tests.



The completion of one DNA project typically leads right into the commencement of another, as the participants seek to gain still more insight.

Oversimplifying slightly, mtDNA can essentially be regarded as the maternal version of Y-DNA testing, although it is not quite as genealogically useful. Bio-Geographical testing reveals what percentage European, East Asian, African and Native American you are, and ethnic tests (all currently available in Y, mtDNA or both) are designed to see whether you share certain genetic patterns which are prevalent in these particular groups. A chart has been provided to show which vendors offer which tests, but please note that this is such a fast-moving field that it may already be outdated by the time of publishing!

If you are planning to conduct a fairly conventional study using Y-chromosome testing, you will also want to consider how many markers to have examined. As of this writing, vendors offer 10, 12, 24, 25 or 26 markers, with some providing both low resolution (e.g. 12) and high resolution (e.g. 25) options. More markers translate into greater cost, but also more meaningful results. The more markers tested, the narrower the time frame in which the Most Recent Common Ancestor (MRCA) lived. While many launch their initiatives with the less expensive tests, most eventually encounter situations which cause them to shift to the higher marker tests.

Other factors to consider in vendor selection include turn-

around time and responsiveness, reporting, access to databases for comparison purposes and management tools (which allow the project manager to extract himself from the middleman role for every transaction). To get others' opinions on these, either contact managers of existing projects or consider joining and posting your questions to Ann Turner's GENEALOGY-DNA mailing list (<http://lists.rootsweb.com/index/other/Miscellaneous/GENEALOGY-DNA.html>).

3. Recruit Participants

At this point, you have an objective in mind and have made the necessary decisions about tests and vendors. Now it's time to find participants! There are two basic approaches for doing this: you can go find them or make it easier for them to find you. Most project managers use both seeking and broadcasting strategies, but in either case, it's important to understand up-front who has the "right" DNA for your project.

Since Y-chromosome testing is most common, that will be our focus here. Your Y-DNA project may be narrow (e.g. to determine if two men share a common ancestor), broad (e.g. to seek out any and all connections among people with the Swanson surname) or somewhere in between (e.g. to determine if various Tennessee and Texas Hardy families share a common ancestor). In the first instance, it will be apparent who should participate, and for the broadest projects, anyone with the right surname will qualify.

But most projects fall in the middle range where participation is less clear. In such cases, you'll want to follow the Y-DNA trail — either to find the participants yourself or to qualify them once they contact you. Doing this is usually not too difficult as you're simply following the sons down through the generations — and with rare exceptions (e.g. a known adoption), this means following a given surname. In the five-generation chart shown at the beginning

of this article, men are represented by squares, women by shaded circles, and women who married into the family by clear circles. The dotted lines show the path of the Y-DNA trail down to the generations with living representatives.

In this case, there are six candidates for testing in this line. Should all six get tested? No, because it would be redundant, not to mention expensive! Barring any non-paternal events or recent mutations, the DNA test results of all of these men would be identical.

In such situations when you have more than one candidate, here are some tie-breakers for selecting the best one:

- A descendant who bears the surname of interest (e.g. not his stepfather's), as it will be easier to explain results
- The person representing the earliest generation, as that will reduce the chance of mutations
- The person who has the most close relatives, as that will provide a better cost-sharing opportunity

If you are going to do the "reverse genealogy" (i.e. tracing from the past to the present) legwork to find appropriate participants, see "A Dozen Ways to Find Your Living Kin" in the May/June 2003 issue of *Family Chronicle* for suggestions to speed your search.

If you opt for a broadcast strategy, you can create a website for your project, list it at your testing company and on master project lists, and attempt to post announcements on relevant surname boards. If you choose to do the last, be careful to follow all rules (e.g. making no mention of dollar figures) or you may find your posting deleted. Since genealogists are naturally more apt to be interested in your study than others, it's important to bear in mind that somewhere between 63 and 72 percent of genealogists are female. This means that you should probably make an effort to enlist the help of women in

TEST	COMPANIES					
	Family Tree DNA	Relative Genetics	Oxford Ancestors	Gene-Tree	DNA-Print	African Ancestry
Y chromosome	X	X	X	X		
mtDNA	X	X	X	X		
BioGeographical	X				X	
African						X
Cohanim	X					
Native American	X	X		X		
Viking			X			

Different DNA testing companies offer the public different types of tests, though the number and types of services offered by various companies changes quickly.

recruiting related men to participate. At the risk of over-generalizing, most women will be somewhat more interested in projects pertaining to their maiden names.

And just in case you encounter any people who have qualms about the DNA collection process (more common than you might think), you might want to refer them to Bob Dorsey's amusing photo series (www.davedorsey.com/dna.html) showing them exactly what to expect.

Regardless of how participants are recruited, one question will inevitably arise: Who pays? Prices for DNA testing have come down (expect to pay \$100-\$570 per test, but mostly in the lower end of this spectrum), but are still considered a luxury by some. You have several options, including:

- fund the study yourself if you have deep pockets!
- allow participants to self-select (via the broadcast strategy) and pay for their own test
- proactively recruit participants and request that they pay for their own test
- ask most to pay, but subsidize or pay for them on a case-by-case basis (e.g. if they're the only living person with a DNA sample that's critical to your study)

If they have contacted you, you may also want to consider asking would-be participants whose

DNA is already represented in your study if they would be willing to essentially "adopt a line" by paying for the testing of someone else who is willing to provide a sample, but unwilling or unable to pay. Also, it helps to remind potential participants that their DNA sample can represent many people and encourage them to ask their siblings, cousins and other relatives to share the cost.

4. Report and Maintain

On the surface, it seems that your work is done once you've had people tested.

And if you have a narrow study whose objective is simply to see whether John Roberts and William Roberts share a common ancestor, you're right. In almost every other case, though, you have more work to do.

First, you'll want to examine the standard report sent by the testing company. Taken by itself, this can sometimes appear to be little more than a collection of numbers. Provided the participants signed releases, you'll be told of any matches, which are the backbone of most studies. Usually, matches mean a confirmation of the hypothesis being tested (although the occasional surprise match can almost be more exciting), but it's generally worth a little extra effort to see what else you can learn.

Some testing companies furnish additional details in online reports. With Family Tree DNA, for instance, you can view Recent Ethnic Origins and Genetic Distance reports. The first lists the countries of origin reported by others whose samples were identical or very close. For an adoptee, this can be an intriguing hint of possible national origin (provided they don't have a common haplotype). The Genetic Distance report tells you how many mutations separate any two people in your study, information that I have found particularly helpful in my own village-based project where men of different surnames are

Probability that MRCA was no longer than this # of generations ago

Markers Match	90% Probability	50% Probability
12 for 12	48 ≈ 950-1200 years	20 ≈ 400-500 years
25 for 25	15 ≈ 300-375 years	7 ≈ 140-175 years

Participants have the option of having 10 to 26 different "markers" identified in their DNA. While the tests which employ more markers are more expensive, their results also confirm a closer link between the participants and their Most Recent Common Ancestor (MRCA).

sometimes genetically closer than men with the same name.

You can also do additional analysis to seek more matches at databases other than the one maintained by your vendor, such as Ybase (www.ybase.org). And if you just can't get enough, peruse archived postings on the DNA mailing list or other projects' websites to learn additional analysis techniques to determine, for example, whether your Y-DNA ancestry is Paleolithic or Neolithic in origin.

In general, the more information you can provide a participant, the more engaged he will be — and that means you will have greater willingness to upgrade or take new tests as they become available, more help in locating other participants and even potentially funding others' tests (yes, it does happen!).

You'll also need to decide how to disseminate your results. Of course, you'll inform the participating individuals first, but more than likely, you'll want to share your findings more broadly, as these new details go a long way toward maintaining and building project momentum. Many have elected to create websites to post this information and that helps all of us, since more readily available data makes DNA testing more useful for all involved. In the interest of privacy, some project

managers have taken the opposite extreme of keeping their studies entirely confidential, while still others have taken a middle road. I, for instance, share information pertaining to my project on a password-protected website and specific aspects in articles and other public venues (with the permission of participants). In general, though, the more open you are able to be with your results, the easier it will be to attract attention

to, develop interest in and "grow" your study.

Time to Recycle

Unless you have an obviously finite objective, chances are that the test results will send you back to step one. If the results are what you expected, you may choose to expand your project to others in another geographical area or with names of a similar spelling to your own. You might decide to launch a new project to investigate another line of your family. Perhaps you'll opt to test for evidence to support or refute the tales of Native American ancestry in your line. Or maybe the results were completely unexpected, forcing you to develop an entirely different hypothesis. Just be forewarned that DNA testing is like that old potato chip commercial; it really is hard to stop at just one!

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