New Zealand Society of Genealogists
Te Rangapū Kaihikohiko o Aotearoa
Family history - Preserving our past for the future

Getting It Right

Effective Research

DNA Basics

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This is part of the "Effective Research" series. These notes should be read in conjunction with the accompanying video which can be found on the NZSG website.

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DNA does not replace paper research!

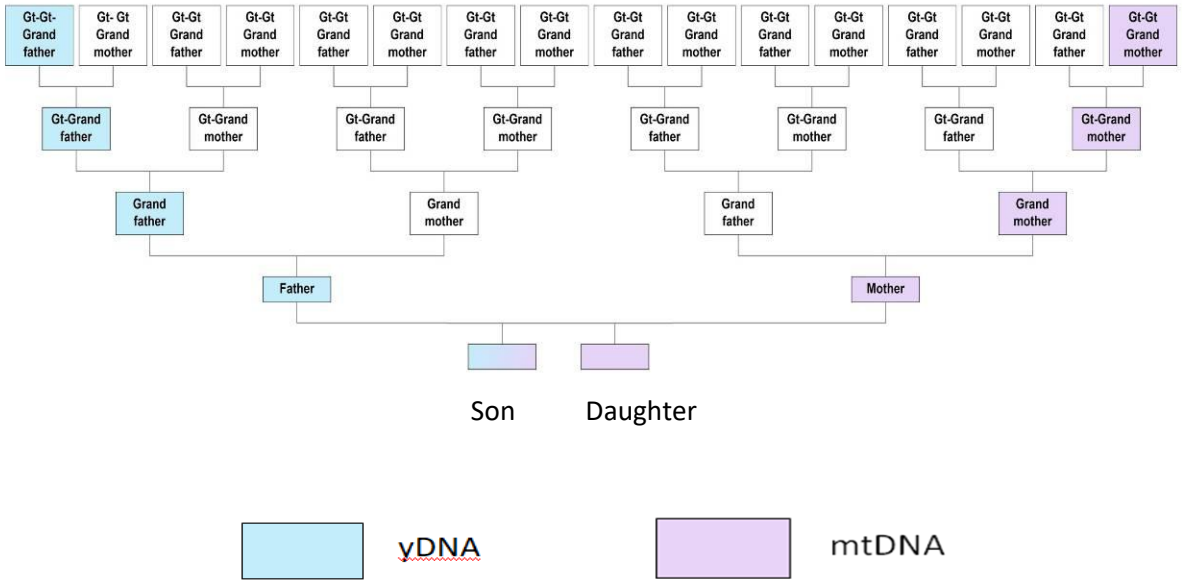
It is another tool we can use to prove that our paper research is correct.

Types of DNA Test

- Y-DNA
  - can only be taken by men because they have the Y chromosome
  - shows the relationship straight up the male (name) line
- Mitochondrial DNA (mtDNA)
  - can be taken by men or women
  - shows the relationship straight up the female line

Both will find links a long way back in your family's history - possibly before records are available.

And they don't test all the other people in-between.



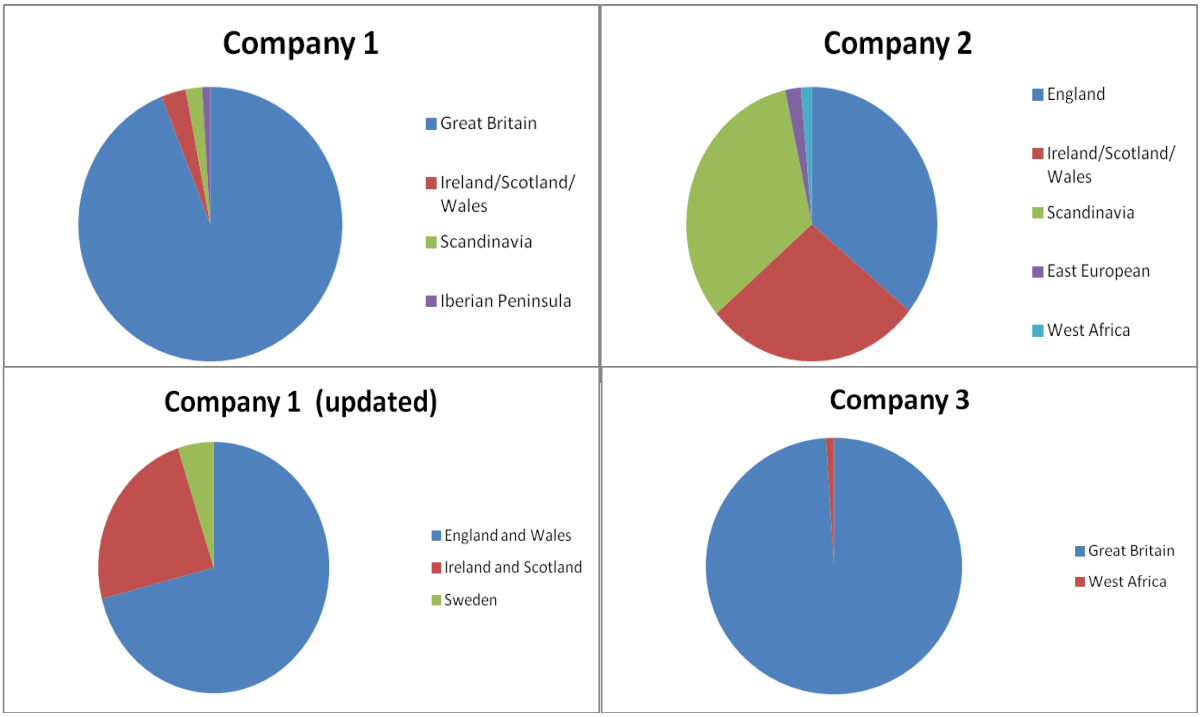
- Autosomal DNA (atDNA, also known as Family Finder)
  - looks at all the DNA that isn't XY ie the 22 pairs of autosomal chromosomes
  - **gives you your genetic family - not your family tree**

Ethnicity Estimates

One of the results you will get from your at-DNA test is an Ethnicity Estimate. The key word here is *Estimate*. There is no standardisation across the testing companies. They use different groups of people, different definitions of location and different algorithms to sort it all out.

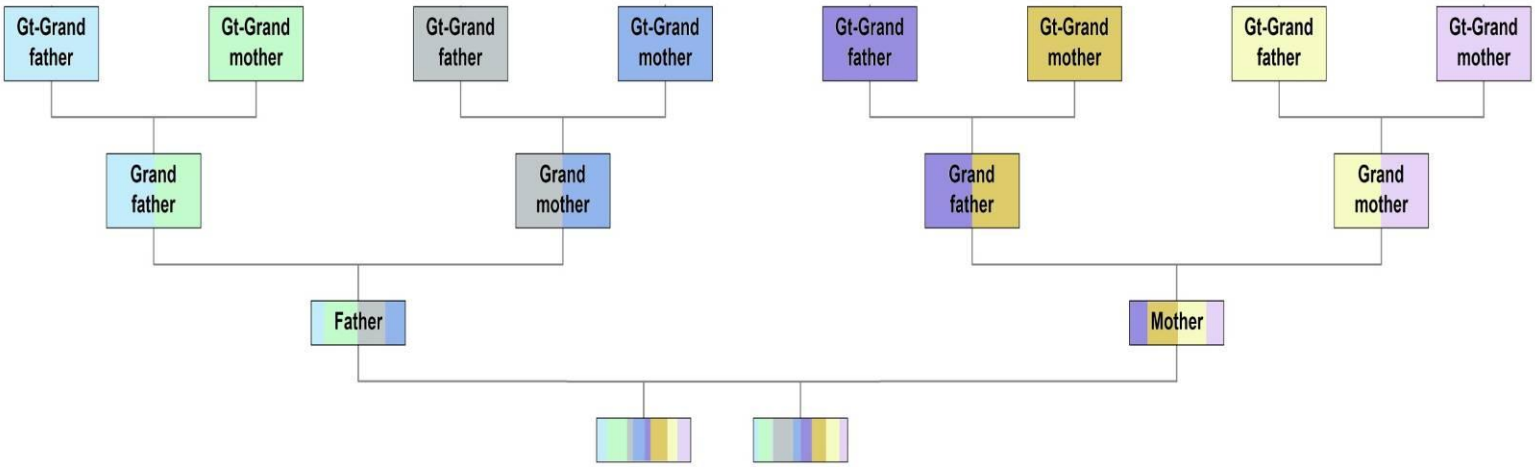
Here's an example showing Sarah Hewitt's results:

	Company 1	Company 1 (updated)	Company 2	Company 3
Great Britain	94%			99%
England		71% (incl. Wales)	35.9%	
Ireland/Scotland/ Wales	3%	24% (excl Wales)	27.8%	
Scandinavia	2%		32.9%	
Sweden		5%		
Iberian Peninsula	<1%			
East European			2%	
West Africa			1.4%	<1%



This is <u>not</u> why we test our DNA for genealogy.

Genetic History vs Family History



You get half your DNA from your father and half from your mother. However, you don't get a quarter each of your grandparents' DNA. This is why you aren't the same as your siblings.

While each of the gt-grandparents in this diagram is shown as a single colour, they too are a rainbow like their gt-grandchildren. Therefore as generations pass, the percentage of DNA you have from distant ancestors gets smaller and smaller.

Generation	% DNA (if you got 50% each time!)
You	100 %
Parents	50 %
Grandparents	25 %
Gt-Grandparents	12.5 %
2 x Gt-grandparents	6.25 %
3 x Gt-grandparents	3.125 %
4 x Gt-grandparents	1.5625 %
5 x Gt-grandparents	0.78125 %
6 x Gt-grandparents	0.390625 %
7 x Gt-grandparents	0.1953125 %
8 x Gt-grandparents	0.09765625 %
9 x Gt-grandparents	0.048828125 %
10 x Gt-grandparents	0.0244140625 %

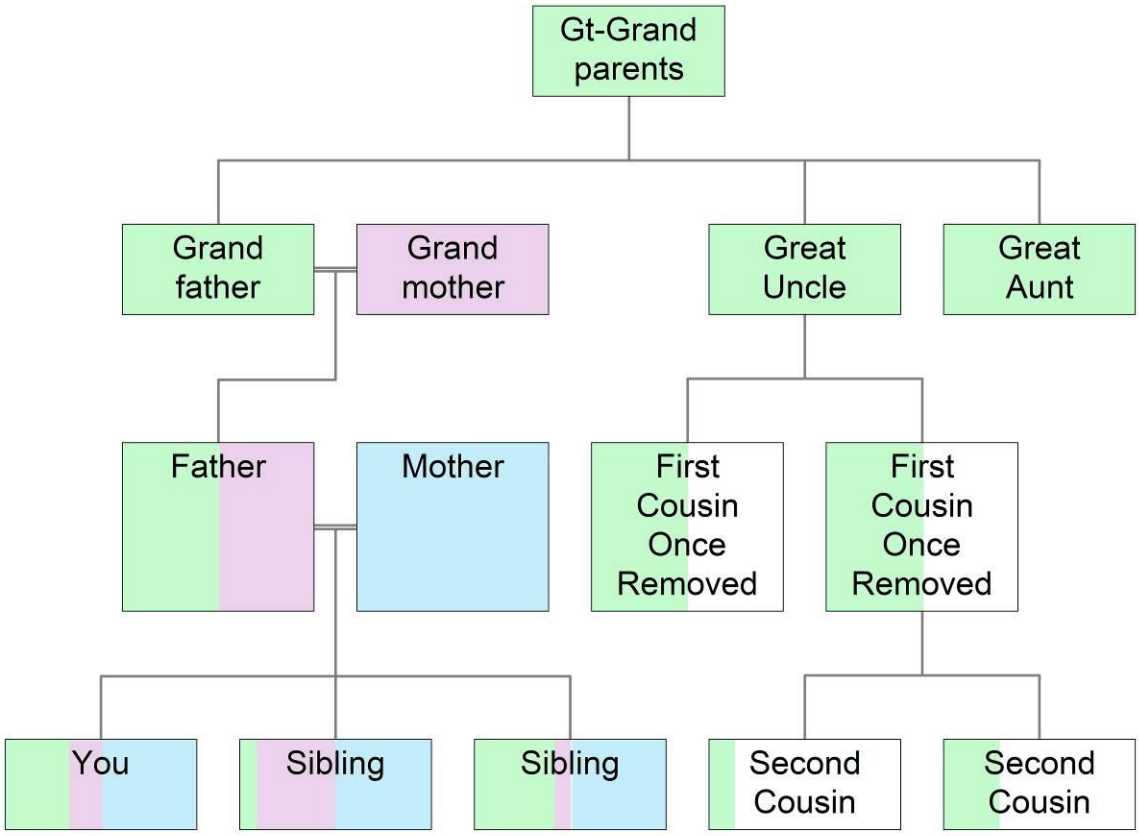
And depending on the lottery of inheritance, you may have no DNA from an ancestor. You have 8 gt-grandparents who each have one person's worth of DNA. You have one person's worth of DNA. Somewhere, 7/8ths of your family's DNA has not been inherited by you.

DNA Matching

DNA testing provides you with "Matches". These are people who have the same segments of DNA as you. They're measured in centimorgans (cM). The higher the cM, the closer the match is related to you. A parent/child relationship has about 3,500cM.

Therefore, it can be useful to test as many family members as you can. Generations older than you but in your direct line (ie parents, aunts, uncles) will have DNA from your ancestry that you might not. If they are not available, siblings will also have a different set of DNA to you. Testing cousins can be useful for figuring out where other people with the same DNA fit into your family tree.

To figure out how your Matches are related to you, you still need to do the paper research. Even if you are looking for an adoption or an illegitimacy, you will still need to do some research on your Matches' family to figure out the connection.



Your second cousins will have inherited some of your gt-grandparents' DNA. A DNA match with them will prove your relationship.

You will definitely match your second cousins, but any more distant than that there is a possibility you will not. Autosomal DNA is best for around 6 generations back.

When to do a DNA Test

If you've done a lot of paper research, you can use at-DNA to confirm your research. Your Matches will be cousins who have common ancestors with you. Do note that many people who do DNA tests do it for their ethnicity estimates and do not have any interest in genealogy. They may not have family trees attached to their results and they may not respond when you contact them.

You have older relatives who agree to be tested. They may not be with us when your paper research is sufficient.

You hit a brick wall early on such as an adoption or illegitimacy. Depending on who has tested, you may be able to figure out parentage when your paper records do not give that information. You will still need to do the paper trail of your matches, especially if they haven't (if they've tested for ethnicity for example).

The Dragon

DNA does not lie. Make sure you are prepared for the possibility that your results will not say what you are expecting.

isogg.org/wiki/Unexpected_results gives details of places you can get help and support if this turns out to be the case.

Further Information

DNA is a completely different type of source to your paper sources.

en.wikipedia.org/wiki/Genealogical_DNA_test

International Society of Genetic Genealogy

isogg.org/

isogg.org/wiki/Wiki_Welcome_Page

isogg.org/wiki/Beginners%27_guides_to_genetic_genealogy - a list of beginners' resources

isogg.org/wiki/Autosomal_DNA_testing_comparison_chart - list of who does tests

New Zealand Society of Genealogists (NZSG)

Online DNA Interest Group (ODIG)

NZSG members can join our Online DNA Interest Group. In addition to monthly presentations, this group has access to a Google Classroom full of resources. However, please note that ODIG is to support members learning about DNA; it is not a "search angel" service.

Members of the NZSG can access a series of DNA Boot Camp webinars produced by Hack Genealogy with the help of genetic genealogy expert Mary Eberle, JD of DNA Hunters.
genealogy.org.nz/DNA-Boot-Camp/11109/

Many members of the NZSG have already tested and can help you with your results. You'll find them at your local NZSG branch:
genealogy.org.nz/BranchesIGs-and-Area-Contacts/11083/

Other Information

www.familytreemagazine.com/article/DNA-Fact-or-Science-Fiction
- 6 Genetic Genealogy Myths

Tools

dnapainter.com/ - tools for analysing your results

Glossary

Terms used in this presentation

Centimorgans (cMs) - a unit for measuring genetic linkage. The higher the number, the closer the relationship between two people.

DNA - Deoxyribonucleic acid - the building blocks of life - en.wikipedia.org/wiki/DNA

Where to next?

This is part of the *Effective Research* series in *Getting It Right*. Have a look at our other resources at genealogy.org.nz/Getting-It-Right/10915/

Getting It Right:

- **Starting Your Genealogical Journey**

- **Effective Research**
  - Genealogical Proof Standard
  - Recording conventions
  - Getting Help
  - **DNA Basics**
  - Searching Newspapers
  - Other People's Trees

- **Sharing Your Family History**