

Autosomal DNA Testing and Your Genealogy

Tony Bandy examines a new form of DNA testing and its implications for genealogists

TAKING MY FIRST GENEALOGY DNA test last year, I was amazed at the results and quickly added the information to my family research file. Today, the popularity of this type of research shows no signs of waning, and dozens of companies continue to offer a barrage of tests and associated products.

However, as scientists continue to learn more about the complex structure of DNA and its role in determining your family's genealogy, a new method of utilizing this personal information code is emerging: Autosomal DNA testing. This new form of research compares a different part of your DNA than most genealogical DNA tests — a part that, up until now, has not been used much and promises new information about your family history and ancestors.

Should you consider this autosomal DNA testing for your own family project? Would this help you to break out of some brick-walls or dead-ends you might be having with your research? It's difficult to say for certain, if only because autosomal DNA testing for genealogical research is fairly new. However, let's take a closer look into the facts and see what we can find out.

What's The Difference?

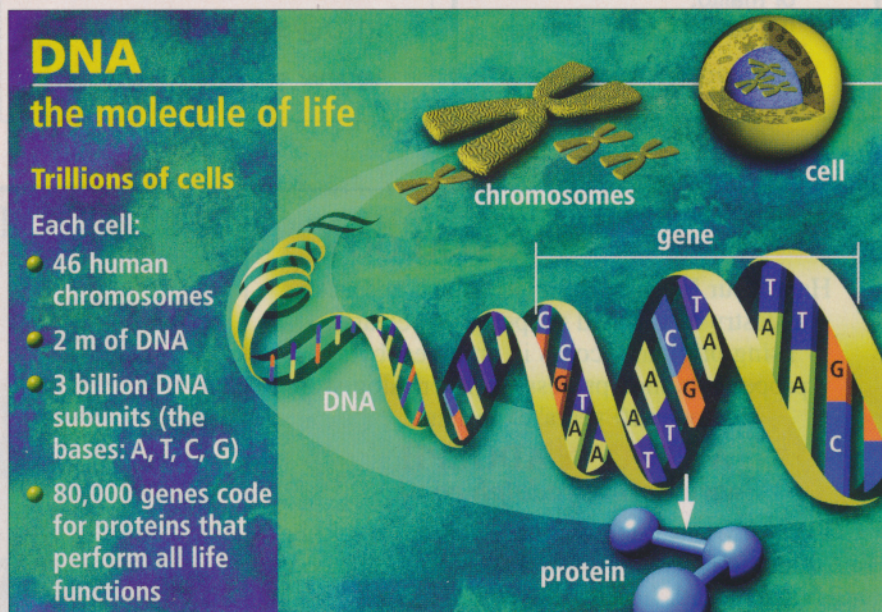
Before we can truly understand autosomal testing, it's important you know how DNA has been used so far in genealogical research. Since DNA contains the genetic code for all of us, most tests today examine the parts of our DNA known as Y-DNA and mtDNA. These specific "pieces" are transferred from our maternal and paternal sides and down through family generations.

Depending upon the scope, this type of examination can often be quite accurate in determining direct family lineage and ancestry

information. Further examination of these same parts can also determine "haplotype" or "haplogroup", helping to pinpoint population groups your ancestors may have been part of. These types of testing and research reports have become sort of an

sive the results can be.

Autosomal DNA testing also differs from regular genealogical testing in that this process will sometimes use collected databases of genetic markers and sequences in comparing submitted DNA samples. Some of these databases



Page from the Energy.gov website.

(Image courtesy of the US Department of Energy Genome Programs, <http://genomics.energy.gov>)

industry "standard" and are offered by many companies in differing forms.

Autosomal Testing

Autosomal DNA testing, however, examines the other parts of your DNA that have, up until now, not been used in standard genealogical examination. By matching your patterns, known to scientists as "SNP's" or "single nucleotide polymorphisms", to larger results gathered through previous samples and studies, it's quite possible to give individual information about your ancestor's population groups (European, Asian, African, etc.), genetic traits, and much more. Current thoughts are the better the match, the more conclu-

include:

- CODIS
www.dna.gov/dna-databases/codis
- Autosomal STR DNA database
www.strdna-db.org
- Omnipop
<http://en.wikipedia.org/wiki/OmniPop>

These databases are not always necessary, but can help to accurately pinpoint historical population groups or other information according to researchers in the field.

Criticism?

Autosomal DNA testing is not without its critics, however, who argue this approach to genealogical research is untested and unproved. In an article from *Science* in October of 2007 entitled,

"The Science and Business of Ancestry Testing", it is stated:

"...questionable scientific assumptions are sometimes made when companies report results of a genetic ancestry test..."

Others in the scientific community would also argue that population groups are too small to be valid measures of DNA or that there is no accepted scientific standard for the use of autosomal DNA in determining genealogy. (Genetic Anthropology, Ancestry, and Ancient Human Migration, Human Genome Project Information, www.ornl.gov/sci/techresources/Human_Genome/elsi/humanmigration.shtml.)

In response to this criticism, researchers state that, done properly, autosomal DNA testing is both reliable and valid. Furthermore, researchers also note that autosomal DNA can reveal quite a bit about a person's ancestors, population groups and more.

However, there needs to be a difference in approach and evaluation, according to Donald Yates, Principal Investigator at DNA Consultants. He goes on to mention that this type of research is NOT the same as standard DNA testing that has been done up till now, and that, "...it cannot tie any given result to a single line or individual in your family tree."

Regardless of the side taken, research continues in the field of autosomal DNA and genealogy and the rise of many research sites, genealogical networking sites and others reflect this increased visibility. Does this take away from any results you might get from your DNA test? Not necessarily.

Getting Started

Controversies and procedures aside, if you're considering getting autosomal DNA testing done, there are many companies offering this type of service. The types of tests offered, as well as what exactly is profiled and used, will vary depending on the service and price you choose.

DNA Consultants, available at www.dnaconsultants.com, offers a wide variety of tests ranging from a basic "fingerprint" autosomal DNA test to complete packages,

including specific matching such as: Melungeons Match, Euro DNA, and others. Their testing also offers ethnic research in the areas of Native American, Southeast Asian, Uralic, and Jewish ancestry. For a complete list of tests and reports, try their product offerings at <http://dnaconsultants.com/our-tests>.

In talking with DNA Consultants and Donald Yates, I found the company has research roots beyond just standard genealogical DNA tests. Some of these projects include Melungeons ancestry,

DNA testing, especially autosomal DNA examination, is at the forefront of genealogy investigation and research today.

Jewish population research and new forms of autosomal testing that focus on advanced research of under-reported values found in DNA samples. Says Donald:

"In autosomal DNA, a good proportion of the values found on any given allele fall outside the reported range: they are rare. But a rare value comes from somewhere. So we are working on identifying the origins in human population history for rare alleles in your CODIS markers. It should be possible to develop a collection of these rare values tied to their origins in the world..."

Other companies to consider in the field of autosomal DNA testing include FamilyTree DNA, 23andme, and others, all of which offer different approaches and a variety of products and services for the genealogist just getting started. To find more information on these companies, try the following links:

- FamilyTreeDNA
www.familytreedna.com/products.aspx
- 23andMe
www.23andme.com/ancestry/

For More Information

In putting together this article and

reading about the subject of autosomal DNA testing (and even other DNA methodologies), I found this is not a simple topic to understand, especially in relationship to how family researchers like you or me can incorporate this into our family genealogies and history. With this in mind, what follows are some links to more background information, published studies and blogs that can help you understand this wide-ranging topic a bit better.

- Autosomal DNA Testing (About.com):
http://genealogy.about.com/od/dna_genetics/p/autosomal.htm
- Autosomal DNA (Background) <http://genealem-geneticgenealogy.blogspot.com/2008/10/autosomal-dna-atdna.html>
- Trace Your Roots With DNA (book):
<http://books.google.com/books?id=J9evrYLpDVEC>
- Wikipedia Entry, Genealogical DNA:
http://en.wikipedia.org/wiki/Genealogical_DNA_test
- Genetic Anthropology, Ancestry, and Ancient Human Migration: www.ornl.gov/sci/techresources/Human_Genome/elsi/humanmigration.shtml
- Genealogy.com:
www.genealogy.com/index.html
- Genetic Genealogy:
http://en.wikipedia.org/wiki/Genetic_genealogy
- Genetic Genealogist:
www.thegeneticgenealogist.com/

Final Thoughts

DNA testing, and especially autosomal DNA examination, is at the forefront of genealogy investigation and research today. Might this be the big breakthrough for your family research project, breaking down brickwalls and helping your ancestors to truly become part of your family? It very well could be. At the least, you will understand a bit more about your ancestors beyond just dates, names and faces.

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