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# Genomics: A New Tool for Genealogists

BY DENNIS L. JOHNSON



Recent advances in DNA analysis offer impressive new tools and resources in the quest for researching our family origins. This was the thrust of a presentation on DNA in family history research by *Thomas H. Roderick*, Ph.D., to the Swedish Genealogy Club of the American Swedish Historical Museum in Philadelphia on October 15, 2005. Dr. Roderick is Senior Staff Scientist, Emeritus, at the Jackson Laboratory in Bar Harbor, Maine. Among his other distinctions, Dr. Roderick is credited with establishing the use of the term "Genomics." This term is used to describe this general field of study.

Dr. Roderick's presentation outlined the basic principles of DNA research and techniques, and how these advances aided in confirming or disproving a relationship established by usual family history records searches. He illustrated this application with several anecdotes about the relationships between many of the royal families of Europe, and by the recent revelations confirming descendants of Thomas Jefferson through a slave girl in his household, Sally Hemmings.

DNA is a component found in the cells of all living organisms and, usually, in their dead remains. Through new techniques in the analysis of DNA, researchers have learned a great deal about the relationships of humans to each other and to other living things. Humans are alike in 99% of their genes, only 1% account for the many differences in appearance between individuals and groups. In fact, all mammals are alike in 97% and differ in only 3%. It is in this small per-

centage, however, where our origins can be examined and traced.

## Two methods

The most advanced research into DNA use consists of two different methods, one used in tracing the male line and one used in tracing the female line. This is most useful in following the continuous male lineage only using the y-line DNA found in the y chromosome in men, and in following the continuous female lineage found in the m-line mitochondrial DNA found in women. Following other lines in your family tree is more difficult, for example through your grandmother's great-grandfather, because of the differing tracing methods needed. This more complex tracing is not yet well developed, and awaits further research and data accumulation. Several organizations are collecting DNA samples in the form of cheek swabs from many individuals to further the charting of human origins and migrations.

## A single African 'Adam'

Research into human DNA has already led to several conclusions now generally accepted by geneticists and human geographers. All non-African men living today, as studied through the y-lines of people throughout the world, can be traced to a single African 'Adam' who lived about 90,000 years ago. From this individual sprang all the peoples who migrated across Eurasia to populate all the other inhabited continents of the world. Similarly, all humans living today can be traced through their m-lines to a "mitochondrial Eve" who

lived about 100,000 years ago.

To illustrate how this can apply to a single individual today, I recently received the results of y-line testing of my own DNA from a cousin, with whom I share a great-grandfather, and I am of all Swedish descent. I learned that my cousin and I belong to Haplogroup N(LLY22G). The results indicate that "this marker originated in Siberia and is found today in southern parts of Scandinavia as well as NE Europe. Many Russians and the reindeer-herding people of northern Scandinavia have this marker today."

The results go on to say that this marker came from the M9 marker which originated in Iran some 40,000 years ago, which in turn came from M89 appearing some 45,000 years ago in northern Africa or the Middle East. M89 came from M168 some 60,000 years ago from approximately Kenya. This description generally fits with other descriptions of the origins of most Scandinavians in other references, humans who migrated from central Asia into present-day Scandinavia after the great ice age of some 10-15,000 years ago.

## Ordinary genealogical research still lives

While these findings are certainly of general interest to most people, they do little for the specific ancestral search for your family origins in recent times. This search will continue to rely mostly on written records of births, marriages, deaths, and family records followed in the usual way. There are a few specific applications of DNA testing that may apply to the search for your family tree, however.

These would include confirmation or disproving of a connection to an unproved but suspected ancestor. DNA of a deceased ancestor is usually hard to obtain, but sometimes inferences can be drawn by looking at the y-line or m-line of that person's descendants.

Another way in which DNA testing might be useful is if you find a person who you strongly suspect is a relative, but cannot verify this through written records. This might be the case if you run across a person with an unusual surname similar to yours, and other circumstances suggesting common ancestors. Testing could verify whether you are indeed related, or not. Other examples would be to verify whether an adopted or illegitimate child is in fact related to one or both parents. Other uses would be in verifying the ethnic ancestry of certain groups, or verifying the ancestry of persons for membership in societies claiming common descent from certain ancestors or groups.

## Scandinavian pitfalls

For those pursuing Swedish, or other Scandinavian, relationships relying on common surnames, there are special pitfalls not found in most other nationalities or groups. The common use of the patronymic naming system through the 19th century (for example, Olaf Peterson, or Karin Larsdotter) meant that the surname changed with each generation.

A few families, such as the nobility, generally kept a common surname over many generations but most did not. In addition, many Swedes changed their surnames when the government required selection and adoption of a family surname at the end of the 19th century, often opting for nature-names and the like. Others changed their surnames or the spelling of them when they migrated to North America or became citizens.

There are several sources available for obtaining results from testing of your own DNA for those who are interested. In the U.S., you can

contact Dr. Roderick at The Jackson Institute, e-mail [thr@jax.org](mailto:thr@jax.org) or the National Geographic/IBM Genome Project. Other DNA testing companies include:

**[www.dnaheritage.com](http://www.dnaheritage.com)** in Britain,  
**[www.familytreedna.com](http://www.familytreedna.com)** in Houston, TX,

**[www.relativegenetics.com](http://www.relativegenetics.com)** in Salt Lake City, UT, and others.

The costs can vary from \$100.00 to \$450.00 or more, depending on the number of markers requested. Most experts recommend that you request at least 25 markers for the most useful results. Your DNA test results will take 4-6 weeks after forwarding a cheek swab sample and your payment.

For those who wish to read further on the subject, Dr. Roderick has provided the following list of recommended references: (for an excellent first book, I would suggest *DNA and Family History*, by Chris Pomey, listed below).

Megan Smolyenyak and Ann Turner, *Trace Your Roots with DNA*, Holtzbrinck Publishers, 2004, 272 pp., \$14.95 (Amazon.com, \$10.47 plus shipping).

Chris Pomey, *DNA and Family History*, The British National Archives, 2004, 168 pp., about \$25.00 (Amazon.com, \$17.55 plus shipping).

Brian Sykes, *The Seven Daughters of Eve*, W.W. Norton & Co., New York, 2001, 307 pp., hardbound and paperback. (Amazon.com, \$10.85 plus shipping).

Spencer Wells, *The Journey of Man, a Genetic Odyssey*, The Princeton University Press, 224 pp., (Amazon.com, \$10.46 plus shipping).

*The Journal of Genetic Genealogy (JOGG)*, on line, contact

**<http://www.jogg.info>**

The above article is based partly on the presentation and notes of Dr. T.H. Roderick given at the American Swedish Historical Museum, Swedish Genealogy Club meeting, on October 15, 2005, together with other sources used by the author.

## The top list of children's names in Sweden 2005

### Girl's names

2005	2004	Name
1	(1)	Emma
2	(2)	Maja
3	(5)	Julia
4	(13)	Alice
5	(3)	Ida
6	(6)	Linnéa
7	(4)	Elin
8	(8)	Alva
9	(7)	Hanna
10	(11)	Ella

### Boys' names

2005	2004	Name
1	(3)	Oscar
2	(1)	William
3	(4)	Lucas
4	(2)	Filip
5	(7)	Isak
6	(11)	Elias
7	(8)	Alexander
8	(6)	Emil
9	(13)	Hugo
10	(9)	Viktor

All according to *Statistics Sweden* ([www.scb.se](http://www.scb.se))

Old male names like Carl (25), Erik (17), Anders (not in top 100), Per (not in top 100) are losing ground to newcomers like William (2), Pontus (50), Neo (82), and Melvin (41). Names that were popular around 1900 are also strong: Theodor (49), Alfred (50), Gustav (14), and Ludvig (23).

The same tendency is clear among the girls' names. Anna (46), Lisa (43), Maria (82), and Stina (58) are on their way out. In comes names like Tindra (23), Jasmine (63), Nova (44), and Tuva (37).

Actual names from today's (Feb. 26) morning paper are Elsa, Sofia, Greta, Antonia, Fredrika, Sigrid, Hermine, Julia, Linnea, Zoe, Clara, and Dina for girls.

New baby boys are Lowe, Marcus, Caspar, Erik, Gustaf, Ian, Axel, and Wiggo.