

Ewing Surname Y-DNA Project

Article 4

This is the fourth in a series of articles about the Ewing surname Y-DNA project. The first three articles have appeared in the last three issues of the *Journal of Clan Ewing*, and they are also available on-line at

<http://www.clanewing.org/Y-DNA.html>.

Understanding this article will require that one has a reasonable understanding of the information in the previous articles. Sadly, the third article was rendered nearly incomprehensible by the way the tables and charts were broken up in the process of repaginating it to fit the format of the Journal. I apologize for that, and hope interested persons took the time to look at the tables on our website. For this issue of the Journal, I have prepared an insert of the results tables on a single piece of paper so that this won't happen again. That said, I urge you to read through the text part of the third article again now that you have the intact tables in your hands. *[Online readers can find the "insert" at the end of this article, and if they print this article, the tables will print in an easily readable format. They can also view uncorrupted versions of the previous tables that are posted with the third article.]* Talking about a new field requires at least some new vocabulary, and to understand what follows you will need to know what such terms as "genetic distance" and "modal haplotype" mean. These and other important terms are defined in the third article.

In this article, I will focus on the implications of what we have learned so far in the DNA project for conventional genealogic research. At the outset of the project, we set the goal of recruiting 100 participants, which we thought would be enough to reveal some amazing things. We now have results on 22 men. This is already enough that we have learned a few interesting things, and it is enough to allow us to illustrate the principles involved.

Genetic Results

We have learned that our participants represent four distinct Ewing families that are not related to one another. We also have one McEwan who is not related to any of the other participants. Take a look at the results table with participant initials down the left side and marker loci across the top. The first row is the modal haplotype.¹ Notice that no entry on that row is highlighted with any color. Entries in remaining rows are highlighted if they differ from the corresponding entry in the modal haplotype: green signifies a one step difference and yellow a two step difference. As you can see, the men in the last 16 rows² are much more similar to one another than they are to the five men in rows two through six.

¹ This concept is defined in my third article, in the August 2005 issue of the Journal of Clan Ewing.

² I have left one of the men in the 17-member family out of the results tables. See footnote number 9 below for the reason for this.

The seventeen men in the largest Ewing family differ from the modal haplotype at four or fewer loci. On that basis, we have concluded that they are descended from a single Ewing man, and that there is a 50% probability that he lived no longer ago than 18 generations (about 450 years).³ Have a look at the second results table, headed “Time to Most Recent Common Ancestor (TMRCA).” In this table, project participants are listed down the left side and also across the top. Where a participant intersects with himself, the number of markers tested is shown. Where a participant intersects with any other participant, an estimate of the TMRCA is shown. The colors just help us see groups of shorter or longer times. Men in the largest family intersect with others in the same family in the predominantly yellow area in the lower right corner of the table. In the yellow part of that area you can see estimates of TMRCA ranging from 250 to 450 years. You can also see some green clusters within the predominantly yellow area. These suggest branches of the 17-member family, which share a MRCA who lived more recently. Indeed, conventional genealogic evidence supports this, and has allowed us to actually figure out who one such individual is. Let’s discuss this next.

Conventional Genealogic Data

James Morgan Ewing & Dean Scott Ewing

Mostly, we will be discussing branches of the 17-member Ewing family in this article, but first let’s notice that another of the Ewing families probably has two members. James Morgan Ewing (JM) and Dean Scott Ewing (DS) are not known on conventional genealogic grounds to be related to one another. But notice on the TMRCA table the small island of yellow in the predominantly white area where they intersect with one another: TRMCA is estimated at 300 years. If you will check the results table, you can see that their haplotypes differ at only four loci. This is highly suggestive of a relationship and they are working on finding it.

“I Believe His Name Was William Ewing”

Clan Ewing Chancellor Emeritus Joe Neff Ewing (JN) is a 6th great-grandson of Nathaniel Ewing (1693-1748) and Rachel Porter [Fife, Chapter 24]. Danny Gerald Ewing (DG) is a 7th great-grandson of James Ewing (1708-1788) and Ann Dunn [Fife, Chapter 28]. William Roy Ewing (WR) is a 6th great-grandson of Joshua Ewing (1704-1753) and Jane Patton [Fife, Chapter 25]. Nathaniel is thought to be the half-brother of James and Joshua.⁴ Donna Ewing Barbee, a Clan Ewing member and the sister of WR, has argued that these three immigrant Ewings are the sons of Patrick Ewing of Burt (Londonderry), and perhaps the grandsons of a William Ewing. Clan Ewing genealogist Jim McMichael finds her

³ If you are a math whiz and are very interested, you can read all about how these figures are calculated at <http://nitro.biosci.arizona.edu/ftDNA/models.html>.

⁴ From the point of view of Y-DNA, there is no difference between brothers and half-brothers with the same father. Having different mothers will have no effect on the Y-DNA, which depends only on the father.

argument interesting but not persuasive, and is more inclined to accept as a hypothesis that their father was William, based only on the not very solid evidence that a grandson of Nathaniel said, “I believe his name was William Ewing.”⁵

Have a look at the TMRCA table. You can see that where these three men (JN, DG and WR) intersect with one another, there is a square green area, and TRMCA for them is estimated at 175 years. Now, have a look at the first results table. You can see that these three men all differ from the modal haplotype at DYS 391, where they have 10 repeats instead of the modal 11, and at CDY_a, where they have 35 repeats instead of the modal 37. No other project participant has CDY_a = 35; this can be used as a marker to distinguish the descendants of “I-believe-his-name-was-William,” who we will now start calling “William?.” If a new participant who doesn’t know his genealogy joins the project and turns up with CDY_a = 35, we will know what to tell him.

You will have noticed while looking at the results table that four other men have DYS 391 = 10. Even though Jason Ewing (Js) in row three had only 12 markers tested, he differs on so many that he can’t be a part of this family and the same DYS 391 value must be merely coincidental. But Earl Norman Ewing (EN), Raymond Charles Ewing (RC), and Edward Gibson Ewing (EG) are similar enough to be considered members of the same family—descended from some kind of cousin of William?, perhaps, but not from William?, himself, because they don’t have CDY_a = 35. Let’s consider them a little more closely.

EN and RC are known to be 3rd cousins of one another. Their earliest known Ewing ancestor is John Ewing (b. bet. 1763-1775 in NY, d. 1812-13 in Vermillion, OH, m. 2nd Lucy Williams). Their immigrant ancestor is not known [and I think their line does not appear in Fife]. Their families ended up in the Ft. Wayne, Indiana area, and include Clan Ewing members Beth Ewing Toscos, Jane Ewing Weippert and Karen Avery. There is no known connection between their ancestors and the famous Ft. Wayne Indian trading family, but EG is descended from this line, and he also carries the DYS 391 = 10 mutation. Ellsworth Ewing hypothesized that EG’s Ft. Wayne ancestor, Alexander Ewing (1763-1827, m. Charlotte Griffith) [Fife Chapter 42], is the son of Alexander Ewing (1741-1799, m. Jane Patrick) [Fife Chapter 24, p197], who was the eighth child of Nathaniel Ewing (1693-1748, m. Rachel Porter). Margaret Ewing Fife thought and Jim McMichael thinks that no convincing case has been made for the connection of the Ft. Wayne Alexander Ewing with any earlier Ewing ancestor.

The DNA evidence essentially proves that Alexander is not descended from Nathaniel, but provides evidence for a more distant relationship between the two of them. Why do I say this? He does have the DYS 391 = 10 mutation that

⁵ Fife, Margaret Ewing, *Ewing in Early America*, 2nd Edition edited by James R. McMichael and published September 2003 by Family History Publishers for Clan Ewing, page 186. Copies are available through a link on the Clan Ewing website, <http://www.clanewing.org>.

characterizes this branch, and implies that all six men have a common male ancestor not shared by the other Ewings in this family. JN is a known descendant of Nathaniel, and DG and WR are descendants of his half-brothers. But EG does not share the two step mutation (CDYa = 35) that JN, DG and WR all share. This argues that the three of them share a common ancestor that he does not share. JN has two other mutations that EG does not have (CDYb = 37 and DYS 439 = 12). One of these is shared by DG (CDYb = 37). Finally, EG has two mutations not shared by JN, DG or WR (CDYb = 39 and GATA H4 = 10). There is just no way we can reasonably squeeze EG under the common male ancestor of JN, DG and WR. While we think there is a common male ancestor that subsumes them all, it is certainly not Nathaniel, and must be rather an ancestor of Nathaniel.

John Ewing of Carnshanaugh

We have five project participants who are known to be descendants of John Ewing of Carnshanaugh. The genetics of this five-member branch is not as tidy as one might wish; we have proposed this as a branch because we have well worked out genealogies on five of the members. These are Clan Ewing Chancellor George William Ewing (GW), his 4th cousin, Roger Lewis Ewing (RL), Wallace Kelley Ewing (WK), Benjamin Edison Ewing (BE) and Frank Elzia Ewing (FE). GW and RL are 6th great-grandsons of John Ewing of Carnshanaugh [Fife, Chapter 11] through his son William and grandson John Ewing (1754-1832) [Fife, Chapter 11, p 72] and his third wife, Alice Caswell.⁶ WK and BE are 6th great-grandsons of John Ewing of Carnshanaugh through his son "Pocahontas" James Ewing [Chapter 11, p 84] and grandson "Swago Bill" Ewing and Mary McNeill [Fife, Chapter 12]. FE is a 6th great-grandson of John Ewing of Carnshanaugh through his son "Pocahontas" James and grandson "Indian John" Ewing and Ann Smith. Wouldn't it be swell if all five of these project participants shared a unique marker that we could use to define group membership? Sadly, they don't. It may be that John Ewing of Carnshanaugh's haplotype is identical with the Ewing modal haplotype, in which case all the mutations that show up in his descendants would have occurred in generations subsequent to John of Carnshanaugh. The three descendants of "Pocahontas" James Ewing (1721-1801) and Sarah Mayes do share a unique mutation, though, YCA IIb = 22, which can be used as a marker for this sub-branch. This means that if we get a new project participant who has YCA IIb = 22, we will suspect he is descended from Pocahontas James.

It happens that if we are sure of the conventional genealogic facts here, we can figure out exactly when and in whom this mutation took place. It occurred in John of Carnshanaugh as he was making the specific spermatozoon that fertilized an egg in Janet McElvaney, which became Pocahontas James, not to put too fine a point on it. How can we know this? Well, Pocahontas James and Sarah Mayes had two sons: William "Swago Bill" Ewing (1749-1814) and John "Indian John" Ewing (b. ca. 1747). WK and BE are 4th great-grandsons of Swago

⁶ Fife seems not to have information on the descendants of this grandson of John of Carnshanaugh. I have relied on the work of Clan Ewing member Daryl DeHarb.

Bill. FE is a 4th great-grandson of Indian John. All three of these men, WK, BE and FE, share the mutation YCA-IIb = 22 and no other project participant has this. Furthermore, we have two project participants who are descended from another son of John of Carnshanaugh, William Ewing (d. 1781) through his son, John Ewing (1754-1832) and Alice Caswell. They are GW and RL. They do not have this mutation. So we see that all the descendants of one of John of Carnshanaugh's sons have the YCA-IIb = 22 mutation, and none of the descendants of his other son have it. If he had the mutation, all of his sons would have had it. All descendants of both sons of Pocahontas James have the mutation; therefore he must have had the mutation as well. So, John of Carnshanaugh didn't have the mutation and Pocahontas James did. Mutations occur when sperm is being formed, so in this case the mutation of interest must have occurred as John of Carnshanaugh was making sperm to sire Pocahontas James. Q.E.D. and pretty nifty, no?⁷

Now then, have a look at GW and RL, 4th great-grandsons of John Ewing (1754-1832) and Alice Caswell. They share a different mutation, DYS 576 = 19. We could make the argument, as we did above, that this mutation must have occurred either as John of Carnshanaugh was preparing to sire William (d.1781), or as William was preparing to sire John (1754-1832). The problem is that this mutation also appears in a couple of other project participants, who are not known to be descended from John (1754-1832). They are Robert Alan Ewing (RA), and me (DN). It happens that I am descended from John of Carnshanaugh through Pocahontas James and his second wife, Sarah Edwards, but this is in one of my maternal lines so has nothing to do with my Y-DNA. My Y-DNA comes from James of Inch, who may have been a cousin or brother of John of Carnshanaugh, but we don't have good evidence about this. In any case, it is plain that my branch took off before the mutation occurred that shows up in George and Roger (GW and RL). Robert Alan Ewing's line is not worked out back to the immigrant. He has hit a "brick wall" at Robert Ewing (1799-1857), married Mary Dawson. It is possible that Robert Ewing (1799-1857) is the son or grandson of George and Roger's ancestor John Ewing (1754-1832); indeed, if I were RA, I would carefully check to see if this might be so. But it is also possible that he is more closely related to my line, or is in yet a third line where this mutation occurred independently. It happens that DYS 576 is a "rapidly

⁷Q.E.D. stands for "*quod erat demonstrandum*," which is a Latin phrase meaning "which was to be proven" that we used to write at the bottom of our geometry proofs in Jr. High School. I remembered this and I just wanted to show off a little. I need to leave a caveat, though. We have project participants descended from only two of John of Carnshanaugh's five known sons so far. It is at least theoretically possible that John of Carnshanaugh did carry YCA-IIb = 22, and that a mutation occurred in his son William or grandson John back to YCA-IIb = 23, the Ewing modal value for this locus. This would require us to hypothesize that there was a mutation in some ancestor prior to John of Carnshanaugh where the modal YCA-IIb = 23 mutated to 22, then "back mutated" to 23 in John's son William or grandson John. That is possible, but not likely. We could "prove" that the mutation occurred rather in John of Carnshanaugh as he was preparing to sire Pocahontas James if we could find a descendant of one of John of Carnshanaugh's other sons, Alexander, John Jr., or Samuel, and find that he also carried the modal value of YCA-IIb = 23.

mutating” marker, which makes us somewhat less surprised to see independent mutations in more than one line. We don’t want to make too much of the distinction between “rapidly” and “slowly” mutating markers, though. Notice that George (GW) and his fourth cousin Roger (RL) differ from one another at a “slowly” mutating marker, DYS 460. That could have occurred in any one of five sperm making events. The odds were certainly against that happening, but it did.⁸

Two paragraphs ago, I began by saying “...if we are sure of the conventional genealogic facts here...” We must recognize that these conclusions about YCA IIb = 22 being a marker and DYS 576 = 19 not being a marker for sub-branches of the family of John of Carnshanaugh depend heavily on the accuracy of the conventional genealogic evidence submitted by five project participants. In fact, conventional evidence for the connection of Pocahontas James Ewing and John of Carnshanaugh is rather tenuous. It is very clear that YCA IIb = 22 is a marker for descendants of Pocahontas James, but as we accumulate additional DNA data, it may emerge that this marker supports the descent of Pocahontas James from a different immigrant, and/or that DYS 576 = 19 will turn out to be a marker for the descendants of the father or grandfather of John Ewing of Carnshanaugh.

James Ewing (c1720/5-1776)

Stanley Clement Ewing (SC) and David Charles Ewing (DC) are father and son and trace their lineage back to James Ewing (d. 1776, m. Mary Shellenbarger) [Fife, Chapter 37]. SC’s haplotype is a single two-step mutation away from the Ewing modal haplotype.⁹ William Charles Ewing (WC), the brother of *Journal of Clan Ewing* editor Jill Spitler and a relative of Clan Ewing members Eleanor Swineford, Betty Whitmer and Barb McGuiness, is also thought to be descended from this James Ewing, but though the DNA data don’t rule out a close relationship between SC and WC, they do not strongly support it. WC does not have DYS 439 = 11, but rather 12, only one step from the modal 13. He also differs from the modal haplotype (and from SC) at two additional loci: DYS 437 = 14 and DYS 576 = 17. On purely genetic grounds, we would estimate the MRCA of WC and SC at 10 generations, but they may be no more closely related than with one another than they are with the other members of the 17-member family. We will need data on more members of this branch to answer this question. And if we get some new project participants who are known on conventional genealogic grounds to be descended from William Ewing (1728-1790) [Fife

⁸ I should also point out that Robert Alan has a unique mutation within this branch of the family, DYS 390 = 24, that might make one try to group him with the two-member family consisting of JM and DS, but the numerous other differences between him and them rules that out.

⁹ David Charles Ewing had only a 12-marker profile done. Of course, all 12 markers matched his father; and, if he had had 37 markers checked, they all almost certainly also would have matched. I have left DC out of the results tables because the number of markers tested impacts the TMRCA calculation, and this would have resulted in some unsightly and misleading purple blotches in the middle of my nice yellow family group. I should also comment that TD had only 25 markers tested, but if he had the remaining 12 done and they all matched the modal values, he would move into the largest family, though just barely.

Chapter 9], we may be able to determine if there is merit to Fife's suggestion¹⁰ that this James Ewing is related to that line.

The Remaining Differences

You will notice several other differences sprinkled here and there in the 17-member family, such as DYS 449 = 30 in Francis Ivan Ewing (FI) and DYS 607 = 15 in Wallace Kelley Ewing (WK). All we can say about these at the present time is that they distinguish the man who carries them and will be passed on to his male descendants. As we get more DNA data, we may find new project participants who have these same mutations, and we can begin to discuss whether they are markers for another branch or sub-branch of the family. It bears commenting upon that FI, who is at genetic distance one from the modal haplotype and is thus squarely in the middle of the 17-member family, is descended from Joseph Ewing (b. ca 1787 in Ireland, m. Elizabeth Gilbert, d. 1848 in Ohio), who was born in Ireland nearly 60 years after many of the Ewing ancestors in this same family immigrated to this country. This makes me think that if we can get Ewing men in Ireland and Scotland to join our project, we may be able to get some leads on where the common ancestor of this family lived.

Conclusion

We are beginning to get some provocative results in the DNA project. As you will have noticed, the most interesting results we have obtained so far are in branches of the family where we have several participants descended from immigrant ancestors known or suspected to be closely related. In some of these families we have been able to identify marker profiles that will allow future participants to get a good idea of which line they should explore to surmount brick walls. Meanwhile, we are trying to find connections between immigrant families that will help us focus research in Ireland and Scotland to find our common ancestors. What we need in order to move the project forward is the participation of more representatives of known immigrant ancestors. We are especially anxious to have the participation of men who might be descendants of the father of the legendary "six stalwart brothers,"¹¹ who may have included John Ewing of Carnshanaugh [Fife Chapter 11], Robert Ewing the father of Alexander [Fife Chapter 23], Finley Ewing the father of Thomas [Fife Chapter 6], James Ewing of Inch [Fife Chapter 41], William? the father of Nathaniel [Fife Chapter 24] and his half-brothers Joshua, Samuel, William, James and George [Fife Chapters 25, 26, 27, 28 & 29 respectively],¹² and who knows who may have been the sixth? Jim McMichael guesses there must have been an Alexander, and reminds us not to forget the cousins of the "six stalwart brothers," whoever they may have been. With enough DNA project participants and some good conventional genealogy sleuthing, we may get this family tied up after all.

¹⁰ Fife, page 331 in Chapter 37.

¹¹ See James McMichael's article, "One Last Item" on p 28 of the November 1998 issue of the *Journal of Clan Ewing*. This is posted on our website, www.clanewing.org.

¹² And their cousins, Charles and Robert—see Fife, page 21.

To Join or Get More Information

If you are ready to join the project, go to

<http://www.familytreedna.com/public/ewing>

and then click on "Join this group" at the top of the blue section on the left of the page. You can also see a table of our most current results there if you will scroll down to the bottom of the page. A more easily readable set of results tables is also maintained on the website of Clan Ewing. There are also links on the FamilyTreeDNA website to articles and FAQs. If you want to ask me questions, e-mail me at:

davidewing93 at gmail.com.

or call me at 505-764-8704 in the evening.

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Albuquerque, NM

DNA Results Comparison																																					
ID	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	G	Y	Y	D	D	D	D	C	C	D	D				
	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	C	C	Y	Y	Y	Y	D	D	D	D					
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modal	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12
JMc	13	24	14	11	11	15	12	12	13	13	13	29	18	9	9	11	11	25	15	19	29	15	15	15	15	11	11	19	23	16	14	19	18	36	36	12	12
Js	13	23	14	10	11	14	12	12	12	13	14	30																									
JM	13	24	15	11	11	15	12	12	12	12	13	28	18	9	10	11	11	25	15	19	29	15	15	17	17	11	12	19	23	16	14	18	17	36	38	12	11
DS	13	24	15	11	12	15	12	12	12	12	13	28	17	9	10	11	11	25	15	19	29	15	15	17	18	11	12	19	23	16	14	18	17	36	38	12	12
TD	13	25	14	11	11	13	12	12	12	12	13	14	29	18	9	10	10	11	25	15	18	30	15	16	16	17											
EG	13	25	15	10	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	10	19	23	18	16	18	17	37	39	11	12
EN	13	25	15	10	11	13	12	12	12	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	17	17	37	38	11	12
DG	13	25	15	10	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	17	16	18	17	35	37	11	12
JN	13	25	15	10	11	13	12	12	12	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	35	37	11	12
WR	13	25	15	10	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	35	38	11	12
RC	13	25	15	10	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12
WC	13	25	15	11	11	13	12	12	12	13	14	29	17	9	10	11	11	25	14	18	31	15	16	16	17	11	11	19	23	18	16	17	17	37	38	11	12
SC	13	25	15	11	11	13	12	12	11	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12
FI	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	30	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12
FE	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	10	19	22	18	16	18	17	37	38	11	12
WK	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	22	18	15	18	17	37	38	11	12
BE	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	22	18	16	18	17	37	37	11	12
DN	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	19	17	37	38	11	12
GW	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	19	17	37	38	11	12
RA	13	24	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	19	17	37	38	11	12
RL	13	25	15	11	11	13	12	12	12	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	10	11	19	23	18	16	19	17	37	38	11	12
Distance from reference:																		Zero		One		Two		Three+													

Time to Most Recent Common Ancestor (Years)																						
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modal	37	1600	2425	1375	1250	725	250	250	300	300	175	100	250	100	100	175	175	175	100	100	175	250
JMc	1600	37	2425	875	950	1750	1850	1850	1725	1850	1725	1725	1850	1725	1600	1850	1725	1725	1475	1475	1375	1725
Js	2425	2425	12	3025	3775	1475	1925	1475	1925	1475	1925	1925	1925	2425	2425	2425	2425	2425	2425	2425	2425	1925
JM	1375	875	3025	37	300	1550	1600	1475	1600	1475	1475	1475	1475	1375	1375	1475	1475	1600	1475	1475	1375	1475
DS	1250	950	3775	300	37	1950	1475	1375	1475	1375	1375	1375	1375	1250	1250	1375	1375	1475	1375	1375	1250	1375
TD	725	1750	1475	1550	1950	25	875	725	875	725	875	875	725	725	575	725	725	725	725	725	875	575
EG	250	1850	1925	1600	1475	875	37	300	300	300	250	175	450	300	300	250	375	300	300	300	375	450
EN	250	1850	1475	1475	1375	725	300	37	375	250	250	175	175	250	300	375	375	375	250	250	300	250
DG	300	1725	1925	1600	1475	875	300	375	37	175	175	250	525	375	375	450	450	300	375	375	450	525
JN	300	1850	1475	1475	1375	725	300	250	175	37	175	250	375	300	375	450	450	300	375	375	450	375
WR	175	1725	1925	1475	1375	875	250	250	175	175	37	100	375	250	250	300	300	300	250	250	300	375
RC	100	1725	1925	1475	1375	875	175	175	250	250	100	37	300	175	175	250	250	250	175	175	250	300
WC	250	1850	1925	1475	1375	725	450	175	525	375	375	300	37	250	300	375	375	375	250	250	300	250
SC	100	1725	2425	1375	1250	725	300	250	375	300	250	175	250	37	175	250	250	250	175	175	250	250
FI	100	1600	2425	1375	1250	575	300	300	375	375	250	175	300	175	37	250	250	250	175	175	250	300
FE	175	1850	2425	1475	1375	725	250	375	450	450	300	250	375	250	250	37	175	175	250	250	300	375
WK	175	1725	2425	1475	1375	725	375	375	450	450	300	250	375	250	250	175	37	175	250	250	300	375
BE	175	1725	2425	1600	1475	725	300	375	300	300	300	250	375	250	250	175	175	37	250	250	300	375
DN	100	1475	2425	1475	1375	725	300	250	375	375	250	175	250	175	175	250	250	250	37	50	100	175
GW	100	1475	2425	1475	1375	725	300	250	375	375	250	175	250	175	175	250	250	250	50	37	100	175
RA	175	1375	2425	1375	1250	875	375	300	450	450	300	250	300	250	250	300	300	300	100	100	37	250
RL	250	1725	1925	1475	1375	575	450	250	525	375	375	300	250	250	300	375	375	375	175	175	250	37

0-225 Years 250-475 Years 500-725 Years 750-975 Years

- Infinite allele mutation model is used
- Average mutation rate varies: 0.0040 to 0.0054, from FTDNA derived rates
- Values on the diagonal indicate number of markers tested
- Probability is 50% that the TMRCA is no longer than indicated
- Average generation: 25 years