Meek DNA Project
Group B Ancestral Signature

The purpose of this paper is to explore the method and logic used by the author in establishing the Y-DNA ancestral signature for the Meek DNA Project Group B as well as the various subgroups and branches. This is possible due to the number of test results and genealogies available for analysis. However, more data is needed to increase the level of confidence for some conclusions. Some of the conclusions presented here may change as more data becomes available.

Background

There are two types of Y-DNA tests. First is a STR[1] marker test, such as the 37-marker test from Family Tree DNA. This test looks at the patrilineal linage back through genealogical time frames and beyond. These are useful for surname studies and will be discussed later. The other component is the haplogroup[2] or SNP[3] test. SNPs also looks at the patrilineal line and compliments STR marker tests. With overlapping time frames SNPs can also look further back in time. However, in some cases it can show family structure not revealed by STR makers. Some haplogroups can be predicted by examining the STR haplotype[4] but can only be confirmed by a SNP test. Generally speaking, the modal haplotype[5] for many major haplogroups is known. Meek Project Group B is in the "R1b"[6] haplogroup. Specifically, a branch headed by the SNP R-L151[7]. Twelve kits in Group B, representing each of the subgroups, have tested positive for the SNP marker R-BY25608. This is in the S1194 branch of R-L151. The path is R-P310>L151> S1194>CTS4528>S14328>A8469>ZS5789>BY13029>S16939>BY25610>**BY25608**.

The first man to carry the BY25608 SNP was a direct patrilineal ancestor of the men in Group B. At least one of his descendants was named Meek and had the same basic STR signature discussed below. More importantly, SNP testing adds information on how the subgroups are connected to each other and descend from the Group B common ancestor. While confirmation needs to be obtained, it appears SNP testing will confirm some of the conclusions from STR testing discussed below. SNP testing will not however replace STR testing. For more information on Meek Group B haplogroups and SNP testing see "SNP Structure of Meek Group B".

Analysis of STR markers involves a process of looking at the pattern of marker values for a group of related people or a group of people thought to be related. The **ancestral signature[8]** is a deduced haplotype for a group or subgroup. It is determined by calculating the statistical mode for each marker and taking into consideration individual or subgroup differences. Therefore, it is not a modal haplotype. The level of confidence of such calculations is dependent on genealogies, the

[1] STR=Short tandem repeat
[2] Haplogroup: A group of similar haplotypes that share a common ancestor with a SNP mutation. (ISOGG glossary)
[3] SNP= Single nucleotide polymorphism
[4] Haplotype: The term for the set of numbers that consists of your Y-chromosome or mitochondrial DNA results. Haplotypes are also known as genetic signatures. (ISOGG glossary)
[5] A modal haplotype is the most commonly occurring haplotype (a set of STR marker values) derived from the DNA test results of a specific group of people. The modal haplotype does not necessarily correspond with the ancestral haplotype - the haplotype of the most recent common ancestor. (ISOGG glossary)- Most recent common ancestor (MRCA): The most recent ancestor from whom a group of individuals share descent. (ISOGG glossary)
[6] R1b is a misnomer generally refers to the haplogroup R-M269 and its subclades.
[7] R-L151 has four branches, P312, U106, S1194 and A8053.
[8] Ancestral haplotype: The haplotype of a MRCA deduced by comparing descendants' haplotypes and eliminating mutations. (ISOGG glossary)

number of test results involved and their distribution within the different branches of a group of related people.

Defining markers are a sub-set of markers, taken from the 111-marker STR ancestral signature, whose values, taken as a group, are unique in the general population of men in the same haplogroup. The set of defining markers for Group B is those markers that deviate from L151 modal values. Several of the Group B values for these markers are infrequently observed. Subgroups also have defining markers indicated by the deviations from the ancestral signature or higher level subgroup.

Key parts of the Group B ancestral signature appear to be quite old. Each of the defining markers mutated at different times during the process. It is probably impossible to date these changes. However, some of them can be seen to have mutated very early based on other surname groups that branched off before the BY25608 SNP mutation. As time moved towards the present additional markers changed their values. The markers values, as they exist today, when taken together as a set of markers, became the unique Meek Group B signature. This culminated before the time of the Group B common ancestor. Table 2 shows the defining markers and marker values for Group B. In this chart the colored marker names are the subgroup markers.

Table 2	DYS439	DYS389	DYS392	DYS458	DYS447	DYS464a	DYS464b	GATA H4	DYS576	DYS570	CDY	DYS442	DYS438
L151	12	13-29	13	17	25	15	15	11	18	17	37-38	12	12
Group B	13	13-28	12	15	26	14	14	12	19	18	36-37	10	13
Con't	DYS534	DYS710	DYS556	DYS533	DYS575	DYS461		DYS572					
L151	15	36	11	12	10	12		11					
Group B	16	36	11	11	11	13		11					

Meek project Group B has a fairly large number of defining markers. There are ten defining markers in the 37-marker panel. There is one additional defining marker in the 67-marker panel. Finally, there are three additional defining markers in the 111-marker panel. While that is a total of fourteen defining markers, many of these markers may not always be reliable. There are an addition six markers used to define subgroups five of which could have been used as defining markers for the ancestral signature. Any two men in the R-M269 predicted haplogroup who have the same values in most of the Group B defining markers likely share a common Meek(s) ancestor. If their surname is Meek(s), Thomas or Roberts, or variations thereof, it is almost certain that they share a common ancestor named Meek who lived during genealogical time frames.

It has long been observed that some men with different surnames have Y-DNA signatures close to that of the Group B signature. Some of these may have a break in their surname line (NPE) and descend from a man named Meek. Some may connect to the Meek line before the use of surnames. Some may have no genetic connection at all. Experience to date has shown that genealogically significant connections with the Meek surname will usually have DYS447=26 rather than 25.

Subgroup Structure of Group B

Even in the early days of the Meek Project (17 years ago) it was apparent that there were two distinct branches within Group B. They were eventually named subgroups B1b and B3b. However, members of each branch would receive the same list of matches as members of other branch, albeit at different genetic distances. Genetic distance alone did not always show a new member without

a connecting genealogy which branch of Group B he belonged to. It was still necessary to look at the pattern of marker values to determine which matches the new member should focus on.

As the membership of Group B grew there appeared to be other subgroups as well as branches within subgroups. In some cases genealogy assisted in defining branches but in others they have been determined solely on the basis of genetics. A relatively large number of unique marker values allows for the ability to include or exclude a member from Group B. But changes in a relatively small number of markers defined the major subgroups and subordinate subgroups.

While SNP testing has largely confirmed the existence of the STR based subgroups of BY25608, it has also increased our understanding of how the subgroups were connected. This is particularly true of subgroups B1, B2, and B4. Two levels of common ancestors have been added. The haplogroup YP1080, a descendant of the Group B common ancestor, includes subgroup B4 (FT182745) and a second branch, FT303176. This haplogroup includes the common ancestors for subgroup B2 (BY172868) and B1. This also explain some of the STR mutations that define the subgroups. At some point around the time of YP1080 there was a STR mutation DYS576=20 This is true because members subgroups B1, B2 and B4 have that mutation. Somewhat later, there was STR mutation, DYS556=12, around the time of FT303176. We know this because members of subgroups B1 and B2 carry that mutation. Lower-level subgroups based solely on STR mutations may not always turn out to be correct.

Table 3	DYS576	DYS556	CDY	DYS710	DYS570	DYS439
L151	18	11	37-38	?	17	12
Group B	19	11	36-37	36	18	13
YP1080	20	11	36-37	36	18	13
FT182745 SG B4	20	11	36-37	36	18	13
FT303176	20	12	36-37	36	18	13
BY172868 SG B2	20	12	36-37	36	18	13
Subgroup B1	20	12	37-37	37	18	13
Subgroup B1a	20	12	37-37	37	18	13
Subgroup B1b	20	12	37-37	37	17	13
Subgroup B1c	19	12	37-37	37	17	14

Subgroup B1: The ancestral signature for subgroup B1 was established by reviewing over forty 37-marker test results. They included descendants of multiple sons of eight ancestors in the subgroup. In the case of subgroup B1, it is believed that there are three genetic branches. In addition to DYS576=20, which emerged about the time of YP1080, and DYS556=12, which emerged about the time of FT303176, the markers that distinguish subgroup B1 from other subgroups are CDYa=37 and DYS710=37. These mutations emerged after the genetic branch FT303176 and before the common ancestor of subgroup B1. This was determined since most of the members have those values which are not seen, in that combination, in other subgroups. Genetic branch BY172868 (subgroup B2) does not have those values.

Subgroup B1a: This branch continues with the Group B1 signature. The three members of subgroup B1a descend from three ancestors born between 1808 and 1824 in Maryland. The hypothesis is that the Maryland ancestors had a common ancestor who carried DYS570=18 and who lived very near the time that the earliest B1b ancestors from Washington Co., PA lived. Therefore, the common ancestor of the Maryland and S. W. PA families carried DYS570=18. There is minimal proof that the Washington Co., PA Meek families came from Maryland, which has been speculated widely in old genealogies. Three of three members have DYS570=18 while 35 of 41 members of subgroup B1b carry DYS570=17. One or more of the three members with the value 18 may belong in subgroup B1a. This is arguably a weak proof statement. All members of subgroup B1a match the other mutations that identify subgroup B1b.

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One member of this subgroup has completed the Big Y test. His haplogroup, FT303176, is expected and unhelpful. However, he has seven private variants which suggest that additional branches will be found below FT303176. The member is negative for FTC799, the only SNP branch thus far discovered for subgroup B1. Additional SNP testing may resolve the issue and support a separation from subgroup B1b. Until that time, the existence of subgroup B1a is a hypothetical.

The subgroup B1b ancestor Isaac Meek born 1746 carried DYS570=18 based on a single test. Some of the earliest genealogies of the B1 Meek family claim without proof that Isaac Meek came from Anne Arundel Co., MD. This author has been reluctant to move Isaac Meek to the subgroup B1a due to the single test, single marker, and unverified genealogical information. However, if Isaac Meek did in fact carry DYS570=18 and come from Maryland it would support the hypothesis above.

Subgroup B1b: This subgroup started with a descendant of the B1 ancestor who first carried DYS570=17 (26 of 32) in addition to CDYa=37 (27 of 32), DYS710 (6 of 7) and the other marker values brought down from the B1 ancestor. The earliest known ancestors were born in the mid-1700s and moved along separate migration routes. Five or more men went to Washington Co., PA and their descendants moved into Ohio. The other group of three ancestors, including John Roberts, moved through South Carolina to East Tennessee. They moved to Arkansas and eventually Texas. They all appear to have come from a large extended family that may or may not have originated in Anne Arundel Co., Maryland. The one marker difference between subgroups B1a and B1b does not preclude a close connection between the two branches of subgroup B1. One Big Y 500 test shows the haplogroup FT303176 with two private variants. The second member with a Big Y test has a haplogroup of FTC799 with three private variants.

Subgroup B1c: This branch is made up of descendants from multiple sons of Jacob Meek born about 1760 who died in Henry Co., TN in 1824 as well as a couple of men who are thought to have descended from him but have not proven the connection. The results are remarkable because Jacob had two mutations from the subgroup B1b values. They are DYS439=14 and the all-important DYS576=19. As there is no indication genealogically that they had a connection to subgroup B3, DYS576=19 is apparently a back mutation. One member has a haplogroup of FTC799 with one private variant. Jacob was born about the same time as the early B1b ancestors and there is some data to suggest that he came from Washington Co., PA. If true, Jacob likely could not have been a brother or possibly not even a first cousin to the other men who lived in Washington County in the later part of the 1700's due to these two markers that trace back to him. Subgroup B1c appears to descend from the B1b common ancestor but not one of the earliest known ancestors because of Jacob's date of birth and the number of mutations.

The member who descends from Nathaniel Meek and has a Big Y result of FTC799 would not fit in the genealogy of subgroup B1c. In addition, he does not have the two STR mutations that define subgroup B1c. Nathaniel's date of birth is not known but his first known child was born between 1775-1780. It would appear he was a contemporary of Jacob Meek born about 1760. He lived near Jacob in Pulaski Co., KY and witnessed one of his deeds. Still the two mutations that define subgroup B1c can be traced back to Jacob because members descend from two different sons and possibly a third. Based on the above data FTC799 covers more than the descendants of Jacob Meek

(subgroup B1c). But there is insufficient evidence to determine if this haplogroup covers all members of subgroup B1b.

Subgroup B2 (BY172868): There are two members in this subgroup. Both members have a haplogroup of BY172868 with seven and four private variants. One member has an uncertain genealogy. An ancestral signature based on two tests is uncertain. They mismatch on DYS449 and both CDY markers. That would leave them very close to the Group B ancestral signature with an uncertain value at CDY. It was originally listed as a separate subgroup because the earliest known ancestor was born about 1680 and lived in New York City rather than Maryland. Edward Meeks, born 10 May 1680, may have been one of the earliest members of the Group B Meek family to come to the United States.

Subgroup B4 (FT182745: This is the second half of YP1080. Three Big Y tests provide a confirmed haplogroup of FT182745. In addition, the line splits with two members positive for FT405497. This subgroup is based on four 111-marker tests and six additional 37-marker tests with very few STR mutations. They descend from one or more men who came to the United States and settled in Virginia and North Carolina in the 1700s. Most descend from Benjamin Thomas born about 1756 who lived in Anson Co., NC. The ancestral signature is a near match to the ancestral signature of the common ancestor of Group B. The exception is DYS576=20. Because it is one of several subgroups using the Meek(s) surname it is more likely than not that the B4 common ancestor descended from a man named Meek(s).

Non-YP1080 subgroups: The three genetic branches FT88084, FT50483 and the undefined subgroup B6 were formerly included in subgroup B3. STR markers gave a hint to some structure which was noted in the previous subgroups B3a, B3b1 and B3b2. Fortunately, Big Y tests became available and greatly enhanced our understanding of how the three subgroups actually connected to each other. This in turn refined our understanding of the Group B ancestral signature. All three subgroups descended independently from the common ancestor and BY25608.

Table 4	DYS576	DYS389	CDYa	CDYb	DYS570	DYS572	DYS710	DYS556
L151	18	13-29	37	38	17	11	?	11
Group B	19	13-28	36	37	18	11	36	11
SG B3	19	14-29	36	38	18	11	36	11
SG B5	19	14-29	36	38	18	11	36	11
SG B6	19	13-28	36	37	18	10	36	11

Subgroup B3 (FT88084): This branch is remarkable for DYS389-1=14. Members of this subgroup, in addition to DYS389=14-29, also has CDY=36-38. The former is a single mutation due to the unusual nature of DYS389. Any insertion or deletion from DYS389i is also reflected in DYS389ii. However, the opposite is not true. There are 15 members, two of which have a Big Y test. The haplogroup is FT88084, a descendant of the Group B common ancestor and BY25608.

This subgroup includes descendants of John Meeks born about 1710 and who lived in Pitt Co., NC. Unfortunately, connections to his supposed sons are not well documented. Five members have DYS570=17 and five members have DYS570=18. Of the former, 3 are descended from Charles Meeks born 1797, son of Francis, son of Francis Meeks born 1747. However, two other sons of Francis born 1747 and one brother, John born 1740 had DYS570=18. The remaining kits were either unconnected or did not have results for that marker. Therefore, the conclusion is that John Meek born 1710 and consequently subgroup B3 had DYS570=18. Those members in this subgroup

with the value 17 can be reasonably sure that this is a mutation that began with Charles Meeks born in 1797. DYS570=17 does not reflect the ancestor's value for that marker.

Subgroup B5 (FT50483): This subgroup includes two members named Meeks and one named Lee with an unknown connection. One man named Meeks and the Lee member have the Big Y test. The haplogroup is FT50483, a descendant of the Group B common ancestor and BY25608. Subgroup B5 also has the unique mutations found in subgroup B3, DYS389=14-29 and CDY=36-38. The significance of this is not fully understood at this time.

Subgroup B6: This branch was originally included in subgroup B3 although it never seemed to fit there or in any other subgroup. The two members match the Group B ancestral signature except for a unique mutation at DYS572. Neither member has been SNP tested. The members involve two descendants of two Baltimore, MD ancestors born 1785 and 1810 who seem more likely to be related to subgroup B1 based on proximity. However, they do not match the marker values associated with YP1080 or subgroup B1.

Summary

Meek Project Group B is made up of more than 70 men who have been identified by thirteen unique matching STR marker mutations. These mutations, along with the remaining markers from the 111 Y-STR marker test is called the ancestral signature. The Big Y test reveal four major branches or haplogroups below the common ancestor and BY25608. One of those branches, YP1080 has multiple levels and subgroups based on SNPs and STR's. The former will usually take precedence over the latter.

Thirteen members took the advanced SNP marker test known as the Big Y test and all of them were positive for the SNP R-BY25608. This marker represents a position on the "R" Haplotree. All "R" haplogroup men who match the STR marker ancestral signature in Table 2 on page 2 will likely be positive for BY25608. The unknown man who is the common ancestor of all men in Group B would have been positive for R-BY25608.

The Big Y test revealed four major subgroups but not the original four subgroups. A previously unknown SNP, YP1080, and common ancestor combined subgroups B1, B2, and B4. Two men in subgroup B3 are positive for FT88084. Two of three men previously in subgroup B3 tested positive for FT50483 which is now in a new subgroup B5. Two men not SNP tested were placed in new subgroup B6 because they do not fit in any subgroup based on STR markers. Including lower-level subgroups there are seven distinct groups based on STR and/or SNP markers. The common ancestors of each major subgroup were unknown men who lived in an unknown time more recent than the Common Ancestor of all Group B and before the earliest known ancestor(s) of their respective subgroups. All seven genetic branch common ancestors were part of an extended family that lived in an unknown place, probably in England.

Genealogically, some groups have multiple earliest known ancestors primarily born in the 1700's. Future SNP testing may reveal as yet undiscovered genetic branch within the BY25608 haplotree which may intersect one or more genealogical trees.

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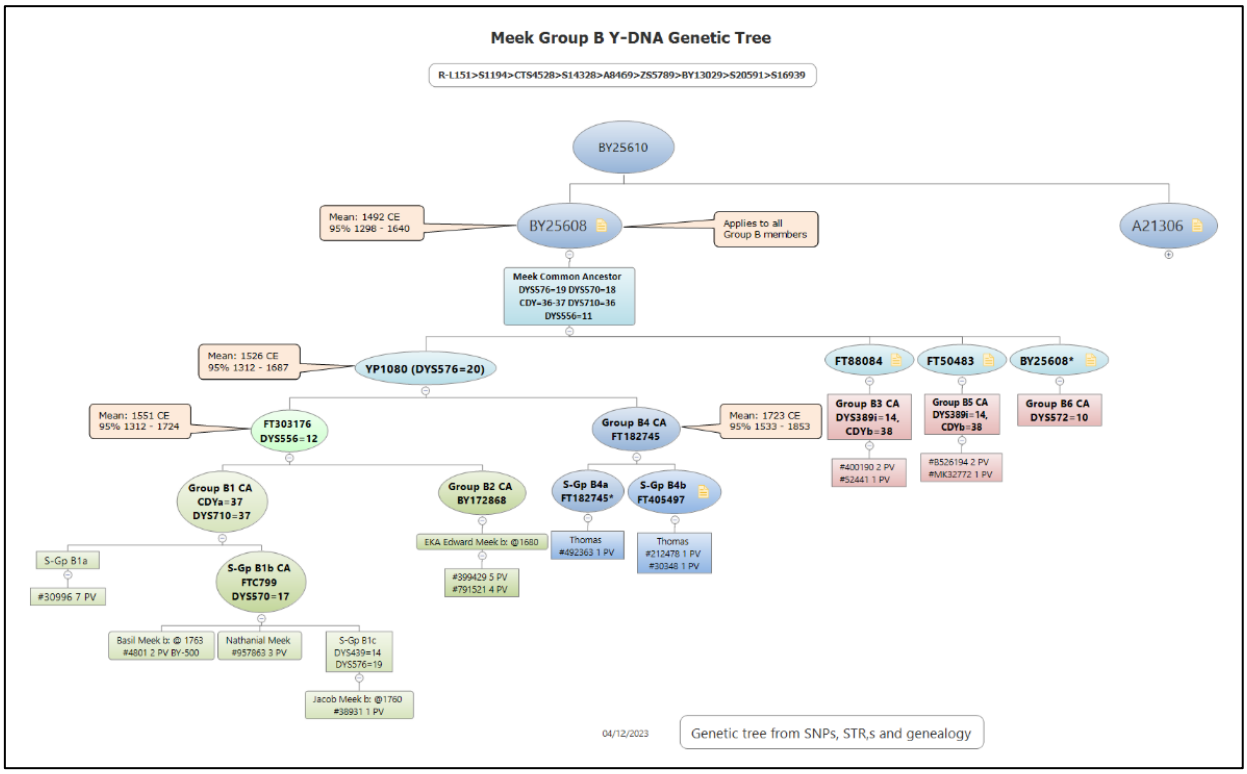
The below tree chart shows the recent haplogroup tree and the STR mutations for the different subgroups. At the center of the chart a rectangle shows the common ancestor of the four major subgroups. Six of the seven subgroups have an identifying SNP marker as well as a unique STR signature.



Group B Ancestral Signature

Additional Tables: 1

Pre BY25608 markers

Table 1	DYS439	DYS389-2	DYS447	DYS464a	DYS464b	DYS570	DYS442	DYS438	DYS461
R1b	12	29	25	15	15	17	12	12	12
Pre Gp B	13	28	25	14	14	18	10	13	13

Additional Tables: 5

Table 5	DYS389	DYS439	DYS576	DYS570	CDYa	CDYb	DYS572	DYS710	DYS556
L151	13-29	12	18	17	37	38	11		
Group B	13-28	13	19	18	36	37	11	36	11
SG B1	13-28	13	20	18	37	37	11	37	12
SG B1a	13-28	13	20	18	37	37	11	37	12
SG B1b	13-28	13	20	17	37	37	11	37	12
SG B1c	13-28	14	19	17	37	37	11	37	12
SG B2	13-28	13	20	18	36	??	11	36	12
SG B4	13-28	13	20	18	36	37	11	36	11
SG B3	14-29	13	19	18	36	38	11	36	11
SG B5	14-29	13	19	18	36	38	11	36	11
SG B6	13-28	13	19	18	36	37	10	36	11

The ancestral signature for each subgroup B1 through B6 uses the defining markers noted above. Each subgroup deviates slightly using a subset of the defining markers as a base. They are DYS576, DYS570, CDY, DYS710 and DYS556 in addition to the markers DYS389, DYS439 and DYS572 for secondary branches. Table 5 shows the mutations from the ancestral signature of all subgroups. Table 6, below, shows the mutations of just the major subgroups.

Group B ancestral signature by major subgroup

Table 6	DYS439	DYS389	DYS392	DYS458	DYS447	DYS464a	DYS464b	GATA H4	DYS576	DYS570	CDY	DYS442	DYS438
L151	12	13-29	13	17	25	15	15	11	18	17	37-38	12	12
Group B	13	13-28	12	15	26	14	14	12	19	18	36-37	10	13
YP1080	13	13-28	12	15	26	14	14	12	20	18	36-37	10	13
SG B1	13	13-28	12	15	26	14	14	12	20	18	37-37	10	13
SG B2	13	13-28	12	15	26	14	14	12	20	18	??	10	13
SG B4	13	13-28	12	15	26	14	14	12	20	18	36-37	10	13
<>YP1080	13	13-28	12	15	26	14	14	12	19	18	36-37	10	13
SG B3	13	14-29	12	15	26	14	14	12	19	18	36-38	10	13
SG B5	13	14-29	12	15	26	14	14	12	19	18	36-38	10	13
SG B6	13	13-28	12	15	26	14	14	12	19	18	36-37	10	13

Table 6	DYS534	DYS710	DYS556	DYS461		DYS572
L151	15	36	11	12		11
Group B	16	36	11	13		11
YP1080	16	36	11	13		11
SG B1	16	37	12	13		11
SG B2	16	36	12	13		11
SG B4	16	36	11	13		11
<>YP1080	16	36	11	13		11
SG B3	16	36	11	13		11
SG B5	16	36	11	13		11
SG B6	16	36	11	13		10