

An experimental computer-generated Y-chromosomal phylogeny, leveraging public Geno 2.0 results and the current ISOGG tree

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Abstract

The author of this report has created software to (i) facilitate the analysis of new Geno 2.0 data, and (ii) automate the preparation of a comprehensive draft Y-chromosomal phylogenetic tree incorporating publicly available Geno 2.0 Y-SNP data. The second item is presented in Section 2.1. Section 2.2 features a phylogenetic tree generated from Full Genomes demo data – a demonstration of this algorithm’s versatility.

Author’s note

Thank you for your interest in this project!

This report was first made public on 16 July 2013. Since then it has gone very mildly viral. This is the fourth version of this report. I would still like to temper some of the excitement directed toward these initial versions of my experimental Y-tree. Please do not overlook the “experimental” nature of this tree. Some subclades proposed by my algorithm are known to be erroneous.

Stated another way, nobody should go out and get their linens embroidered with “M26→L707→YSC0000078” just because of what my experimental tree or predictor said.

The feedback I have received has been positive, encouraging and helpful. I will be the first to admit that further validation of this tree is needed. The computer-generated tree is too vast for one person to validate manually, so I am working on a separate set of tools that will identify – as a last step in the tree-generation process – a (hopefully) short list of inconsistencies in the experimental tree. Each inconsistency will need to be manually investigated in order to determine its cause. One way or another, I think I will be able to improve my algorithm so that the number of inconsistencies is reduced. Those wishing to devote extensive time to manually validating my tree should probably wait until the next release.

These is another class of inconsistencies – a class containing inconsistencies only detectable by haplogroup specialists. The size of this class remains to be seen.

So yes, I have some ideas on how to further refine this process and address some of the outstanding issues. But I will not be able to immediately act on my ideas and release an updated tree. And I have no doubt that further flaws in this tree will surface.

All in all, please regard this experimental phylogeny as informative rather than authoritative. As I wrote in my announcement, it’s not perfect, but it’s a start.

ISOGG volunteers and Y-DNA project administrators: if you are asked to explain differences between this tree and the ISOGG one, you can save yourselves some time by directing people to read [this FAQ item](#).

Chris Morley

1. The need for automation

1.1 Background

Genographic Project 2.0

The second phase of the Genographic Project [1] was announced in July 2012 [2, 3]. One facet of this project is wide-spectrum Y-SNP testing offered at an accessible price. The aggregation of these results will reinforce much of the existing Y-SNP phylogeny, while concurrently leading to the discovery of new branches and the slight repositioning of some existing branches.

The initial round of test results was released in December 2012 [4]. The Genographic Consortium is apparently preparing an updated Y-SNP phylogeny, but to the chagrin of genetic genealogy hobbyists it has not yet been released [5].

Manual analysis of this dataset is time-consuming. The vastness of the data is only one factor; there are several additional challenges to overcome before the data can be compared:

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[†]An earlier version of this report, shaped as a proposal, was released for limited distribution on 5 July 2013.

- the dataset is growing every day;
- the phylogenetic nomenclature is in perpetual flux;
- the publicly available Geno 2.0 Y-SNP data is decentralised;
- many Y-SNPs go by several names.

Even then, after monitoring the above, there are many more challenges at the comparison stage:

- the main source for publicly available Geno 2.0 data (various Family Tree DNA haplogroup project Y-SNP reports, for example, [6]) does not distinguish between negative calls and no-calls;
- some chip-tested SNPs are proving to be globally erratic [7];
- other chip-tested SNPs may be locally erratic (inconsistent results for an SNP may indicate an inadequate choice of primer, or the presence of additional nearby mutation(s) in one or more derived branches);
- some kits have had additional à la carte testing performed for SNPs not offered on the Geno 2.0 chip;
- a few SNPs have in some branches reverted to the ancestral state, potentially resulting in a false-negative call;
- some SNPs are recurrent, and it can be challenging to separate the multiple instances;
- it is not straightforward to determine where newly-discovered SNPs fit in relation to existing SNPs;
- existing phylogenies, against which comparisons are made, may place some SNPs erroneously, complicating the comparison procedure.

The members of the genetic genealogy community – the majority of them part-time volunteers – would therefore benefit greatly from the introduction of a robust tool to automate, standardise and centralise much of this analysis.

Depending on the cause of the “official” Geno 2.0-based phylogenetic tree’s publication delay, the Genographic Consortium may also benefit from the availability of such automation.

In light of the above challenges, this task is more complicated than it would initially appear. This report showcases the results from an initial attempt to tackle this problem.

Full-Y sequencing

Full Y-chromosomal sequencing will see growth over the next few years, soon supplanting chip-based wide-spectrum SNP testing as the test of choice for those seeking to extend the Y-chromosomal phylogenetic tree and determine their own position thereon. This technology will circumvent some of the chip-specific issues, but the corresponding increase in data will accelerate demand for automated analytical tools.

1.2 Prior Technology

Generally, the genetic genealogy volunteer community is quicker than the academic community to act on new phylogenetic discoveries. ISOGG’s Y-tree [8] can therefore be regarded as the most current phylogenetic authority. But as data volume increases, ISOGG’s volunteers will likely need help in order to keep pace with all the new developments. Many of these volunteers maintain separate, decentralised provisional trees for their own branches/haplogroups of interest. The level of detail varies between haplogroups.

The YCC phylogeny has not been updated since 2008 [9]. The Genographic Consortium’s awaited phylogeny is supposed to supersede this.

Thomas Krahn of Family Tree DNA maintains a draft Y tree [10]. It leads the ISOGG tree in some aspects, and lags behind in others. This too could probably benefit from increased automation.

FTDNA forum user Felix has just released *My Y-SNP Tree*, a free tool for comparing Y-SNPs against Thomas Krahn’s draft Y tree [11].

Ethio Helix has roughly classified some of the higher-level novel Geno 2.0 SNPs, using a non-fuzzy set theoretic approach [12].

Public raw Geno 2.0 data is scarce. Itaï Perez is analysing the Y-SNP facet of this raw Geno 2.0 data [13]. This will in particular be useful for external verification of FTDNA’s calling algorithm (applied during the Genographic-to-FTDNA transfer process).

The YFull service has recently classified 1000 Genomes project samples by terminal Y-SNP, using ISOGG tree 8.57 as the basis [14].

1.3 New Technology

Prior to preparing this report, the author developed a Y-SNP-based subclade predictor (now available at <http://ytree.MorleyDNA.com>), with the inputs being a person’s Y-SNP results. It suggests the person’s terminal subclade (or the closest parent subclade tested). This algorithm was able to correctly classify the Full Genomes Y-SNP demo results [15]. It also performed robustly when tested on Geno 2.0 data – either in the form of calls scored from a kit’s raw file, or in the form of calls reported in a public Family Tree DNA project after being transferred from the Genographic project.

The algorithm is most effective when using the ISOGG tree as a basis for classification.

Evidently, the Y-tree clade predictor performs better the more detailed the underlying phylogenetic tree is. And the refinement of a phylogenetic tree is greatly aided by the use of an accurate predictor and other analytical tools. The two pillars bootstrap each other.

To illustrate this, the author has used this Y-tree clade predictor (using the latest ISOGG tree as a basis for comparison) to classify over 1950 sets of publicly accessible Geno 2.0 Y-SNP calls. This information was then used as an input into another algorithm designed by the author – an algorithm developed to automate the construction of a phylogenetic Y-tree, while overcoming the challenges identified above. The technical details of this process will remain proprietary for the time being.

1.4 Data

ISOGG's latest Y-tree was used as a starting point. Off-tree SNPs identified by ISOGG as private or phylogenetically unreliable were not used as inputs. The algorithm used to develop these reports will include these SNPs in the output, if they show up in the available Geno data.

Over 1950 sets of Geno 2.0 positive calls (data transferred from the Genographic Project to Family Tree DNA) were used. These Geno 2.0 results were all collected from publicly accessible haplogroup and surname projects, including the haplogroup projects identified in the ISOGG wiki [16]. Coverage was skewed toward the most heavily-tested haplogroups.

User-provided earliest known ancestor information has been removed from this version of the phylogeny.

1.5 Results

The output of this automated tree-building process is presented in Section 2.1. See Table 1.1 for notation.

1.6 Discussion

Owing to the automated nature of the process, it is straightforward for the author to issue revised computer-generated draft phylogenies, as new information becomes available.

The draft phylogenies resulting from this process will not replace the existing ISOGG tree. But they should help reduce the workload of ISOGG project administrators. It will not make their roles obsolete. Their judgement is still needed to decide which SNPs are worthy of inclusion in the ISOGG tree. Moreover, the algorithm will identify some SNPs with inconsistent information, requiring manual examination in order to place on the tree. The reports developed by the author will serve as a *guideline* for further ISOGG tree expansion; ISOGG will retain editorial control over its Y-tree.

The Genographic Consortium phylogenetic tree – whenever it is published – should be superior to the tree presented here. The Genographic Consortium has a vastly larger and more diverse dataset to work with, and consequently one would expect the resultant paper to contain numerous branches not included here. Additionally, the Genographic Consortium, having access to all the raw data, will know which non-positive calls are negatives and which are in fact no-calls, thereby simplifying the tree construction process. The Genographic Consortium's paper will likely be treated to pre-publication peer review. This will delay the delivery but ensure the quality of the final result. It remains to be seen whether/how/how frequently the Genographic Consortium will update its phylogenetic tree after its initial publication.

Outstanding issues for the experimental phylogeny:

- The *PAGE#* class of SNPs needs to be equated with the *PAGES0000#* class of SNPs.
- The downstream SNP coverage statistics for known backmutations need to be corrected.
- Non-Latin letters (from the user-submitted earliest known ancestor descriptions) typeset as question marks.
- See [this thread](#) for further issues.

1.7 Summary

There is present demand for tools that will automate the production and maintenance of a high-resolution Y-SNP phylogenetic tree. Demand will rise further. This report showcases the results from an initial attempt at tackling this problem.

1.8 References

- [1] Eran Elhaik, Elliott Greenspan, Sean Staats, Thomas Krahn, Chris Tyler-Smith, Yali Xue, *et al.*, *The GenoChip: A New Tool for Genetic Anthropology*. *Genome Biol Evol*. 2013; 5(5): 1021-1031, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3673633/>, 9 May 2013 (accessed 15 July 2013).
- [2] CeCe Moore, *National Geographic and Family Tree DNA Announce Geno 2.0*. Your Genetic Genealogist, <http://www.yourgeneticgenealogist.com/2012/07/national-geographic-and-family-tree-dna.html>, July 25 2012 (accessed 5 July 2013).
- [3] Roberta Estes, *National Geographic – Geno 2.0 Announcement – The Human Story*. DNAeXplained – Genetic Genealogy, <http://dna-explained.com/2012/07/25/national-geographic-gen-2-0-announcement-the-human-story/>, July 25 2012 (accessed 5 July 2013).
- [4] Roberta Estes, *Geno 2.0 Results – First Peek*. DNAeXplained – Genetic Genealogy, <http://dna-explained.com/2012/12/11/geno-2-0-results-first-peek/>, 11 December 2012 (accessed 5 July 2013).
- [5] eng.Molgen.org community, *Geno 2.0 Y-phylogeny*. A Genetic Genealogy Community: Y-DNA, Mt-DNA, Autosomal DNA (Molgen.org English Forums), <http://eng.molgen.org/viewtopic.php?f=4&t=1080>, 24 April 2013 (accessed 5 July 2013).
- [6] Łukasz Łapiński *et al.*, *R1a1a and Subclades Y-DNA Project – Y-DNA SNP*. Family Tree DNA Y-Haplogroup Project, <http://www.familytreedna.com/public/r1a/default.aspx?section=ysnp>, 15 July 2013 (accessed 15 July 2013).
- [7] Itaï Perez, *Re: [DNA] It's been a month, let's start complaining about Geno 2.0 transfer errors*. GENEALOGY-DNA-L Mailing List, <http://archiver.rootsweb.ancestry.com/th/read/GENEALOGY-DNA/2013-01/1358179571>, 14 January 2013 (accessed 5 July 2013).
- [8] International Society of Genetic Genealogy, *Y-DNA Haplogroup Tree 2013, Version: 8.75*. <http://www.isogg.org/tree/>, 6 September 2013 (accessed 7 September 2013).
- [9] The Y Chromosome Consortium, *Ytree (YCC2008)*. <http://ytree.ftdna.com/index.php?name=YCC2008&parent=root>, 2008 (accessed 5 July 2013).
- [10] Family Tree DNA (Thomas Krahn *et. al.*), *Ytree (Draft Phylogeny)*. <http://ytree.ftdna.com/>, 2013 (accessed 5 July 2013).

Symbol Class	Symbol	Description
SNPs	M343	Positions known to ISOGG [8]. If on a branch with available Geno results: then the available Geno 2.0 results are consistent with ISOGG's positioning [8].
	CTS3368	SNPs unplaced in ISOGG's tree – placement has been proposed by the phylogenetic algorithm.
	DF27	SNPs not Geno-tested (or excluded by FTDNA from the list of positive SNPs). Names and placement come from ISOGG's tree [8].
	Y34	SNPs not Geno-tested and not placed on ISOGG's tree [8]. Be careful: some of these SNPs may be widespread and phylogenetically-insignificant mutations which have just not been widely tested; their true positions could be further upstream. Other SNPs may be private.
	L440	Expected by ISOGG to be at this location, but the Geno 2.0 data suggests otherwise. When observed high up in the Y-tree: FTDNA may have the ancestral and derived states backwards, leading to positive results being scored negative, and vice versa.
	CTS2526 ^R	The SNP is recurrent – it has been also placed elsewhere in this tree. Recurrent does not necessarily mean erratic.
	PAGE65 ^b	ISOGG [8] has identified this instance as a back-mutation.
	CTS109 ^F	The novel SNPs upstream of haplogroup R1 have been cross-checked against the Full Genomes demo data (comprised of one kit from R1a and one kit from R1b). Novel SNPs with a superscript F did not test positive in one or both of the Full Genomes demo kits. It remains to be seen which discrepancies were caused by flaws in the Geno 2.0 data and which were caused by flaws in the Full Genomes data. Discrepancies are most abundant at the haplogroup CT level.
Kits	N114522	Kits with Geno 2.0 results. Kit numbers link back to FTDNA project SNP reports; follow the link to see the kit's positive calls obtained from Geno testing, and the positive and negative results obtained from à la carte SNP testing. Surnames and user-provided descriptions of the earliest-known patrilineal ancestor have not been included in this version of the report.
	234391	Kits without Geno 2.0 results, only à la carte or deep clade SNP results.
	*	A kit with this superscript may belong to one of the non-Geno-tested clades immediately downstream. À la carte SNP testing of the non-Geno-tested clade's (or clades') defining SNP(s) will be necessary to definitively place this kit.
Clades	A1	A clade featuring Geno-tested SNPs.
	A0a	A clade that does <i>not</i> feature Geno-tested SNPs.
	-n	Represents a subclade new to ISOGG's tree, proposed by the author's phylogenetic algorithm. For example, R1b1-1 is proposed to be downstream of R1b1 (and upstream of R1b1a). Some of these new subclades, if terminal, may have already been deemed "private" by ISOGG.
	?	This branch does not feature any Geno-tested kits, and consequently its position in the new phylogeny is unconfirmed.
	△	The position of a subclade with this superscript cannot be fully resolved, because not all sister clades were Geno-tested, and none of the kits in this subclade have had the required non-Geno-tested SNPs tested à la carte.
	A1b1 ⁵	This clade has a footnote. Footnotes usually describe automatically detected discrepancies in the tree.
Coverage statistics	[x/y]	y is the number of kits supposedly downstream of this SNP, and x is the number of these kits that are positive for the SNP. Some non-positive results could in fact be no-calls or back-mutations. If this SNP is situated on a branch untouched by Geno 2.0 testing then the figure (which would be 0/0) is omitted. It is also omitted for SNPs that were not Geno-tested and have no positive-testing downstream kits.

Table 1.1: Notation used in the novel draft Y phylogeny

- [11] Felix, *My Y-SNP Tree*. Genetic Genealogy Tools: Open source software for genetic genealogy, <http://www.y-str.org/tools/my-y-snp-tree/>, 3 July 2013 (accessed 5 July 2013).
- [12] Ethio Helix, *Geno 2.0 YDNA SNP Pathways*. Ethio Helix Blog, <http://ethiohelix.blogspot.com/2013/03/geno-20-ydna-snp-pathways.html>, 24 April 2013 (accessed 5 July 2013).
- [13] Itai Perez, *Geno 2.0 Y-Chromosome Genome Comparison: Extending Y-DNA Haplogroup Knowledge via Collaboration*. <http://itai.perez-free.fr/GenoCompare/>, 5 June 2013 (accessed 5 July 2013).
- [14] YFull Y-Chr Sequence Interpretation Service, *YFull 1000 Genomes (Tree)*. <http://www.yfull.com/tree/>, 12 July 2013 (accessed 15 July 2013).
- [15] Full Genomes Corp., *Demo for product: "Comprehensive Y-Chromosome Sequencing"*. <https://fullgenomes.com/demo>, 2013 (accessed 5 July 2013).
- [16] International Society of Genetic Genealogy, *Y-DNA haplogroup projects*. ISOGG Wiki, http://www.isogg.org/wiki/Y-DNA_haplogroup_projects, 26 June 2013 (accessed 5 July 2013).

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

2. Experimental computer-generated Y-SNP phylogenies

2.1 Experimental Y tree (automated, using Geno 2.0 results)

Notice

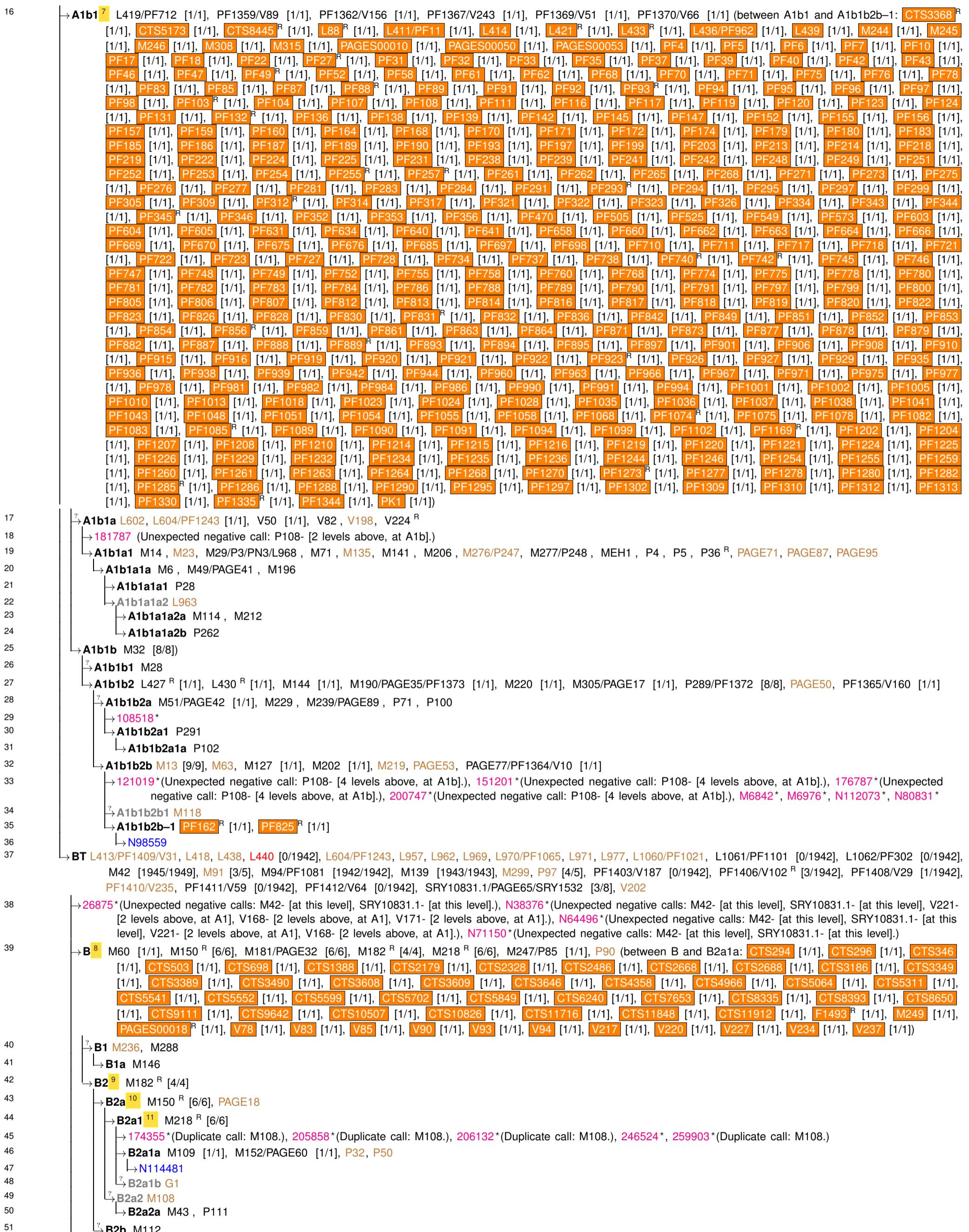
This phylogeny uses ISOGG Y-DNA Haplogroup Tree version 8.75(6 September 2013) [8] as a starting point.

This is an experimental tree. Please do not base major SNP-purchasing decisions on this, yet. It needs to be looked over by some experts to ensure that there are no systematic errors. ISOGG does not sponsor or endorse this experimental tree.

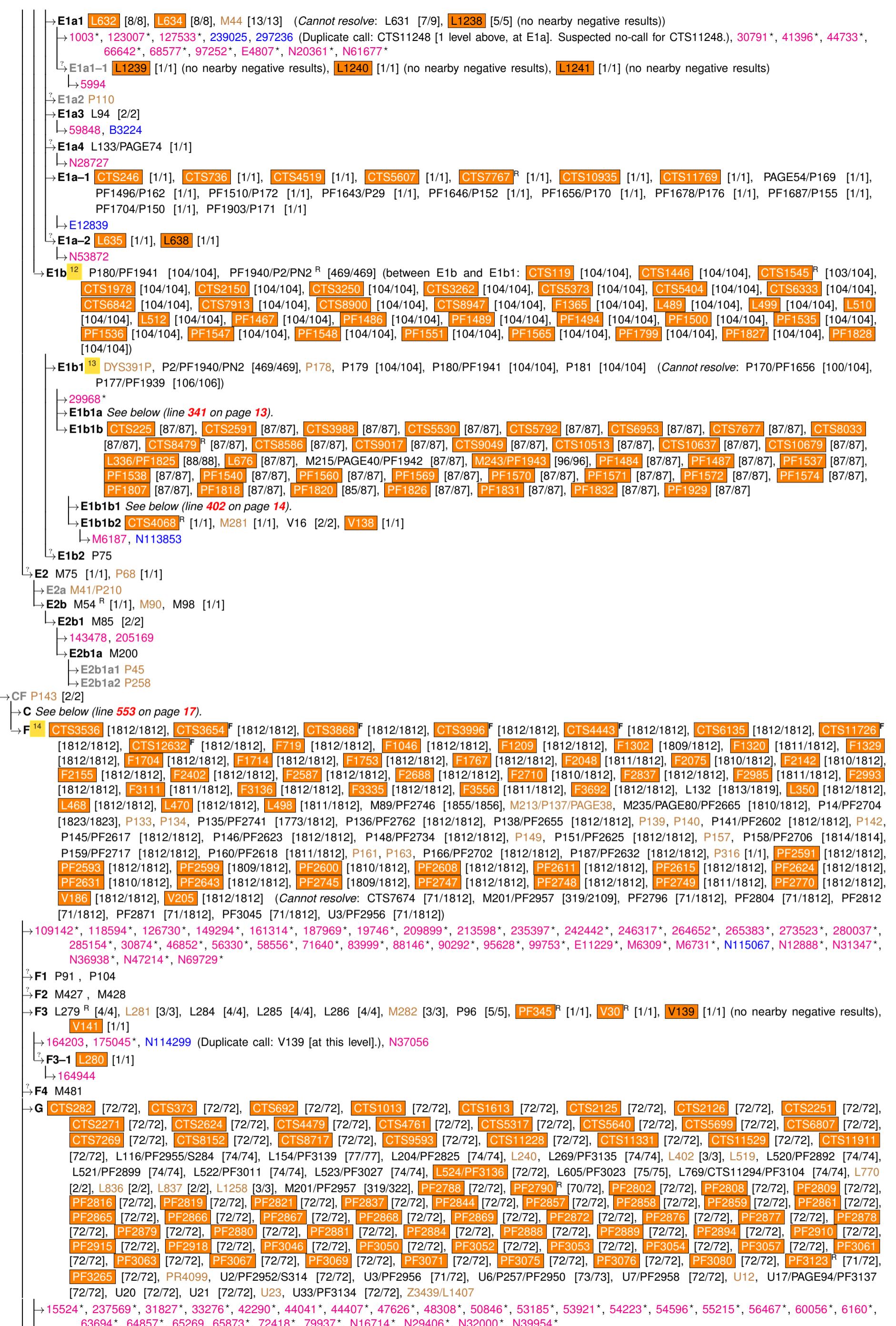
This tree is for personal, non-commercial use. It is to be distributed according to the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported license, *with the additional condition that it may not be used in Y-subclade prediction software without the author's prior consent*.

Trunk

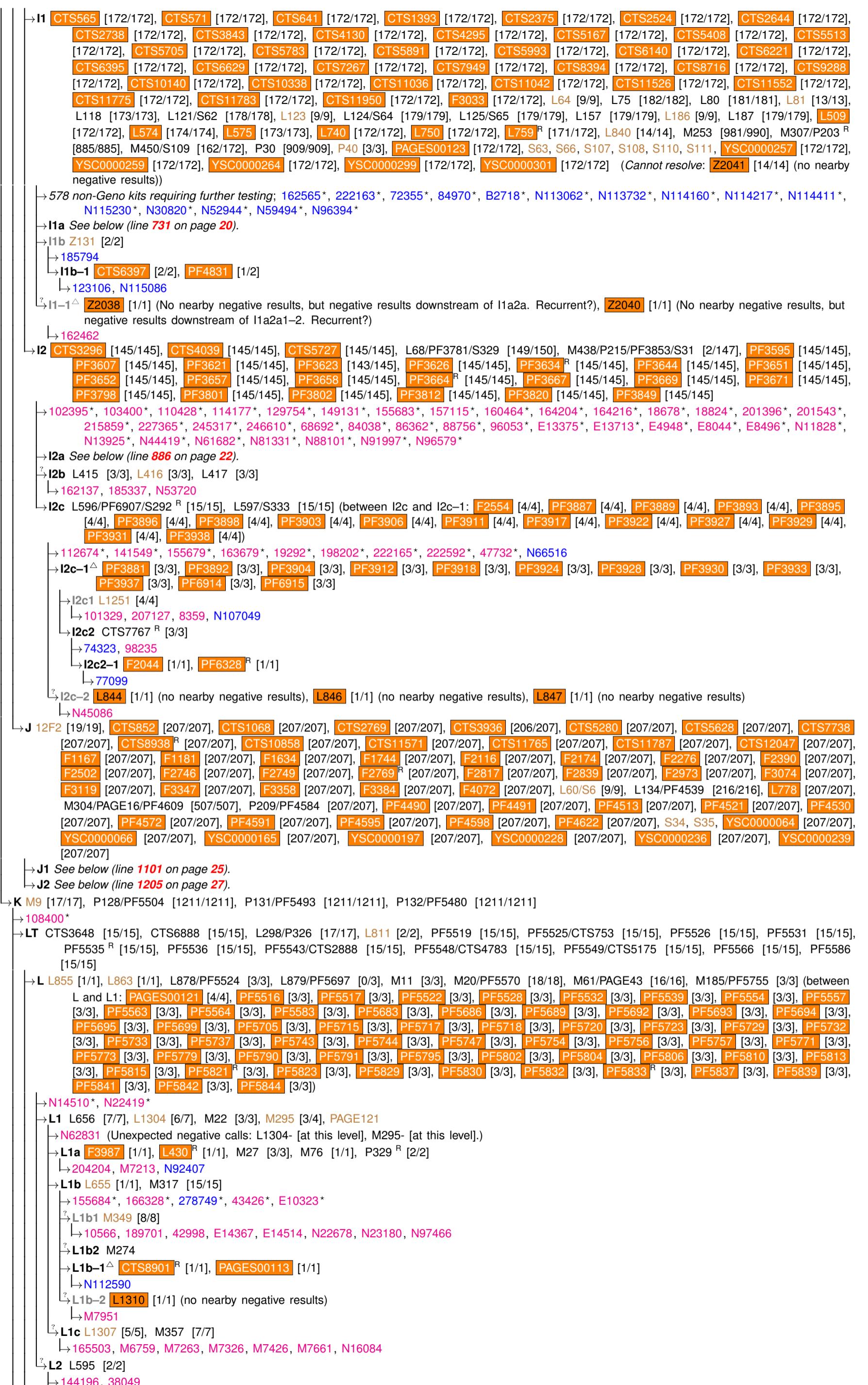


Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.⁷ PF93 also found in nearby clade A1a (line 13 on this page). One set of instances may be erroneous. Further investigation required.⁸ M150 also found in nearby clade B2a (line 43 on this page). M182 also found in nearby clade B2 (line 42 on this page). M218 also found in nearby clade B2a1 (line 44 on this page). One set of instances may be erroneous. Further investigation required.⁹ M182 also found in nearby clade B (line 39 on this page). One set of instances may be erroneous. Further investigation required.¹⁰ M150 also found in nearby clade B (line 39 on this page). One set of instances may be erroneous. Further investigation required.¹¹ M218 also found in nearby clade B (line 39 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.¹² P180 also found in nearby clade E1b1 (line 112 on this page). One set of instances may be erroneous. Further investigation required.¹³ P180 also found in nearby clade E1b (line 111 on this page). One set of instances may be erroneous. Further investigation required.¹⁴ Kit N115067 has 1 positive SNP from the P level (line 313 on page 13). Further investigation is required.

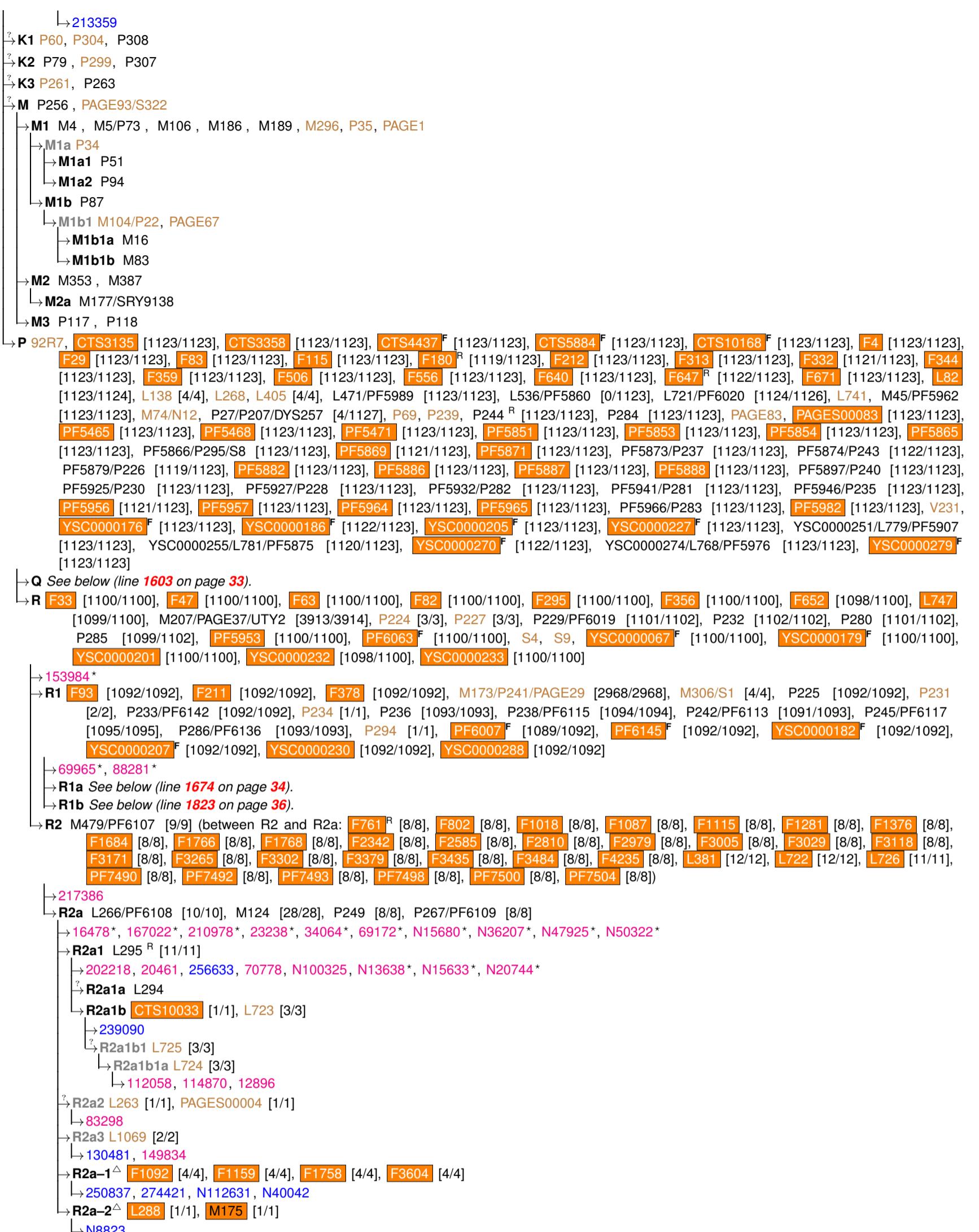
Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.¹⁵ Kit 225438 has 1 positive SNP from the G1a2 level (line 149 on page 10). Further investigation is required.¹⁶ L69 should probably be removed from IJK on the ISOGG page for haplogroup F; it has already been removed from IJK on other ISOGG pages.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.¹⁷ L1322 also found in nearby clade T1a3 (line 282 on this page). One set of instances may be erroneous. Further investigation required.¹⁸ L1322 also found in nearby clade T1a2b-1 (line 280 on this page). One set of instances may be erroneous. Further investigation required.¹⁹ If the classification of kit 213359 is correct, then this would suggest that haplogroup S is closer to macro-haplogroup NO than it is to macro-haplogroup P. Further testing is needed:

- to confirm kit 213359's membership in S-M226;
- to confirm that haplogroup S is indeed derived for F549 and F650;
- to determine the placement of haplogroups K1, K2, K3 and M relative to this potential novel macro-haplogroup.

Positive findings will impact the haplogroup nomenclature system. The author favours the macro-haplogroup names "SON", "NOMS" (French for "names") and "MONKS" –the choice depending on the F549 and F650 statuses of haplogroups K1, K2, K3 and M –over alternatives such as "K(xLT)1" or "(K(xLT))(xM,P)".

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.**E1b1a**

Continued from above (line 114 on page 9)

- 341 E1b1a L222^R [17/18], PN1/P1^R [22/22], V38/TSC0077541 [17/17], V100 [16/17] (between E1b1a and E1b1a1: CTS224 [17/17], CTS1878 [17/17], CTS2075 [17/17], CTS3259 [17/17], CTS3299 [17/17], CTS3344 [17/17], CTS4408 [17/17], CTS5572 [17/17], CTS5629 [17/17], CTS6180 [17/17], CTS6302 [17/17], CTS6319 [17/17], CTS7454 [17/17], CTS8562 [17/17], CTS9768 [17/17], CTS9978 [17/17], CTS11557 [17/17], L501 [17/17])
342 → E1b1a1 CTS3105 [17/17], CTS3989 [17/17], CTS4350 [17/17], CTS4415 [15/17], CTS5539 [17/17], CTS6474 [17/17], CTS7095^R [17/17], CTS7641 [17/17], CTS8068 [17/17], CTS8123 [17/17], CTS8443/TSC0769719 [17/17], CTS8936 [17/17], CTS9188 [17/17], CTS9338 [17/17], CTS10066 [16/17], CTS10638 [17/17], CTS11461/KHS1479188 [17/17], CTS11579 [17/17], CTS11729 [17/17], L488 [17/17], L491 [17/17], L494 [17/17], L608 [17/17], L610 [17/17], M2/DYS271/SY81 [25/27], M291 [17/17], P1/PN1 [22/22], P46 [1/2], P189, P293 [17/17], PAGES00106 [17/17], TSC0424987, V43^R [16/17], V95, Z1101, Z1107, Z1116, Z1120/CTS4245, Z1122/CTS5042 [17/17], Z1123, Z1124, Z1125, Z1127, Z1130, Z1133, Z1135/CTS10806 [17/17]
343 → E1b1a1a²⁰ CTS1847^R [16/16], CTS3576^R [16/16], CTS10659^R [16/16], CTS10914^R [16/16], CTS11732/KHS1381212^R [16/16], CTS12659^R [16/16], L86^R [16/16], L576/TSC0860384, M180/P88^R [16/16], P182^R [16/16] (between E1b1a1a and E1b1a1a1: CTS1001 [16/16], CTS3425 [16/16], CTS4054 [16/16], CTS7282 [16/16], L88^R [16/16], L432^R [16/16], L433^R [16/16], PAGES00066 [16/16])

²⁰ CTS1847, CTS3576, CTS10659, CTS10914, CTS11732, CTS12659, L86, M180 and P182 also found in nearby clade E1b1a1a1 (line 344 on page 14). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

344 | → E1b1a1a1²¹ CTS1847^R [16/16], CTS3576^R [16/16], CTS10659^R [16/16], CTS10914^R [16/16], CTS11732/KHS1381212^R [16/16], CTS12659^R [16/16], L86^R [16/16], M180/P88^R [16/16], P182^R [16/16], PAGE66, Z1111, Z1132

345 | ?→ E1b1a1a1a M58, PAGE27

346 | ?→ E1b1a1a1b M116

347 | ?→ E1b1a1a1c M149

348 | ?→ E1b1a1a1d M155

349 | ?→ E1b1a1a1e M10, M66, M156, M195

350 | → E1b1a1a1f L485^R [9/9]

351 | → 6500

352 | → E1b1a1a1f1 L514 [6/6] (between E1b1a1a1f1 and E1b1a1a1f1a1: CTS905 [6/6], CTS3046 [6/6], CTS5038 [6/6], CTS7773 [6/6], CTS11559 [6/6])

353 | → E1b1a1a1f1a M191/P86 [10/10], U186 [3/6], U247/P253, Z1712/TSC1640819

354 | → B1137 (Unexpected negative call: P9- [12 levels above, at CT].)

355 | → E1b1a1a1f1a1 CTS3822 [5/5], U174/P252 [9/9]

356 | → 109543* (Unexpected negative call: P9- [13 levels above, at CT].), 113226* (Unexpected negative call: P9- [13 levels above, at CT].), 214931* (Unexpected negative call: P9- [13 levels above, at CT].), B2455*, N113227*, N114930*

357 | ?→ E1b1a1a1f1a1a P9

358 | ?→ E1b1a1a1f1a1b P115

359 | ?→ E1b1a1a1f1a1c1 P113

360 | → E1b1a1a1f1a1d CTS3539 [1/1], CTS8639 [1/1], Z1704/CTS8030 [2/2]

361 | → 88172 (Unexpected negative call: P9- [14 levels above, at CT].), N35169

362 | → E1b1a1a1f1a1-1 Z1867^R [1/1]

363 | → 137941 (Unexpected negative call: P9- [14 levels above, at CT].)

364 | ?→ E1b1a1a1f1b L515, L516, L517, M263

365 | → E1b1a1a1f1b1 Z1893

366 | → E1b1a1a1f-1 CTS5961 [1/1], CTS6649 [1/1], CTS9883 [1/1], CTS10560 [1/1]

367 | → N113455

368 | → E1b1a1a1g CTS229 [8/8], U175^R [15/15]

369 | → E1b1a1a1g1 CTS236 [7/7], CTS897 [7/7], CTS3902 [7/7], CTS4110 [7/7], CTS6620 [7/7], F3750^R [7/7], P277 [7/7], P278^R [14/14], U209 [7/7]

370 | → 11280*, 17113* (Duplicate call: P278 [at this level].), 39664*, 7362*

371 | ?→ E1b1a1a1g1b P59

372 | ?→ E1b1a1a1g1c M154

373 | ?→ E1b1a1a1g1d V39

374 | → E1b1a1a1g1-1△ CTS2504 [5/5]

375 | → E1b1a1a1g1a U290 [7/7]

376 | → 48618*

377 | ?→ E1b1a1a1g1a1 U181 [2/2]

378 | → N15560*

379 | → E1b1a1a1g1a1a L97 [1/1]

380 | → 116995

381 | ?→ E1b1a1a1g1a2 Z1725

382 | → E1b1a1a1g1a-1 L649 [1/1], L650 [1/1], L651 [1/1], V221^R [1/1], Z479^R [1/1]

383 | → 200545 (Unexpected negative call: L576- [6 levels above, at E1b1a1a].)

384 | → E1b1a1a1g1a-2△ CTS2184 [1/1], CTS4178 [1/1], CTS7973 [1/1]

385 | → N112889

386 | → E1b1a1a1g1a-3△ CTS421 [1/1]

387 | → B3241

388 | → E1b1a1a1g1a-4△ CTS6613 [1/1]

389 | → 94363

390 | → E1b1a1a1g1-1-1 CTS3243 [1/1], CTS8026 [1/1], CTS8027 [1/1], CTS10652 [1/1], CTS11328 [1/1], Z1721 [1/1]

391 | → 139382 (Duplicate call: P278 [2 levels above, at E1b1a1a1g1].)

392 | → E1b1a1a1g1-2△ F1574^R [1/1], L609 [1/1]

393 | → 12291 (Duplicate call: P278 [1 level above, at E1b1a1a1g1].)

394 | → E1b1a1a1g1-3△ CTS1974 [1/1], CTS3661 [1/1], CTS4015 [1/1], CTS8360 [1/1], CTS8988 [1/1], CTS9954 [1/1]

395 | → N113928

396 | → E1b1a1a1g-1 CTS6143 [1/1]

397 | → N28521

398 | ?→ E1b1a1a1h P268, P269

399 | → E1b1a1-1 PF5659^R [1/1]

400 | → N98448 (Unexpected negative call: P46- [1 level above, at E1b1a1].)

401 | ?→ E1b1a2 M329

E-M35.1

Continued from above (line 116 on page 9)

402 E1b1b1²² CTS890 [86/86], CTS1389 [86/86], CTS2216 [86/86], CTS2474 [86/86], CTS2620 [86/86], CTS3512 [86/86], CTS3637 [86/86], CTS4220 [86/86], CTS4856 [86/86], CTS6298 [86/86], CTS6809 [86/86], CTS6834 [86/86], CTS7154 [86/86], CTS7980 [86/86], CTS8131 [86/86], CTS8945 [86/86], CTS9324 [86/86], CTS9956 [86/86], CTS10184 [86/86], L117/PAGE15/PF1657 [91/91], L538 [87/87], L545 [87/87], L796 [87/87], M35.1 [427/427], PF1454 [85/86], PF1457 [86/86], PF1466 [86/86], PF1471 [86/86], PF1492 [86/86], PF1499 [86/86], PF1531 [86/86], PF1532 [86/86], PF1534 [86/86], PF1542 [86/86], PF1543 [86/86], PF1566 [86/86], PF1575 [86/86], PF1598 [86/86], PF1619 [86/86], PF1755 [86/86], PF1793^R [86/86], PF1801 [86/86], PF1812 [86/86], PF1813 [86/86], PF1830 [86/86], PF1835 [86/86], PF1836 [86/86], PF1871 [86/86], PF1909 [86/86], PF1913 [85/86]

403 | → E1b1b1a V68 [4/4] (between E1b1b1a and E1b1b1a1: CTS2270 [53/53], CTS2661 [53/53], CTS4208 [53/53], CTS7924 [53/53], CTS8899^R [53/53], CTS10323 [53/53], L539^R [66/66], L546 [54/54], PF1956 [53/53], PF2108 [53/53], PF2114 [53/53], PF2115 [53/53], PF2173 [53/53], PF2175 [53/53], PF2178 [53/53], PF2182 [51/53], PF2185 [53/53], PF2188 [53/53])

404 | → N4849

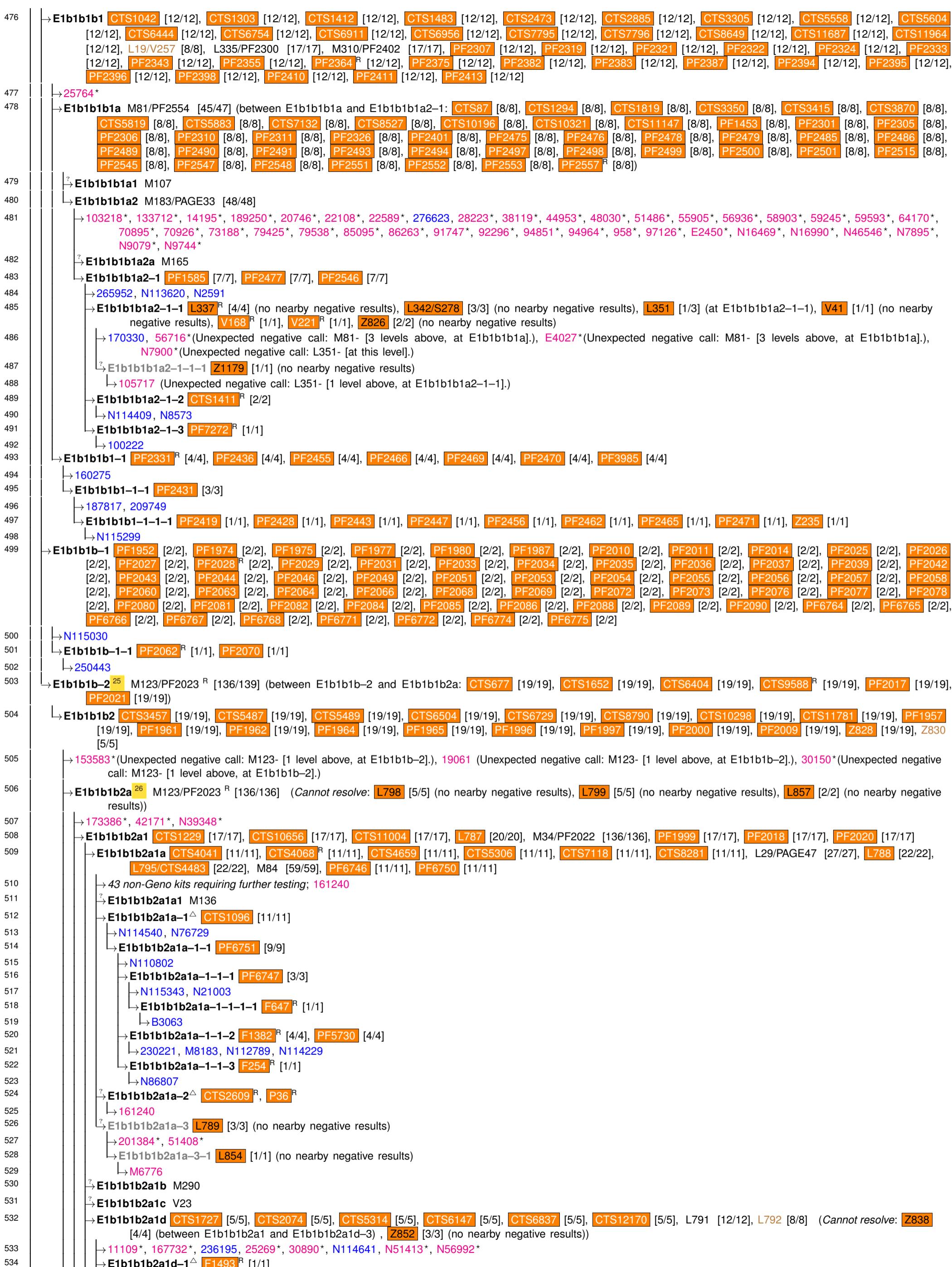
405 | → E1b1b1a1 CTS58 [52/52], CTS675 [52/52], CTS3278 [52/52], CTS5561 [52/52], CTS5697 [51/52], CTS7166 [52/52], CTS10617 [52/52], CTS11082 [52/52], CTS11310 [52/52], F1244 [52/52], L18 [4/4], L541 [54/54], L544 [65/65], L547 [53/53], M78/PF2186 [305/305], PF2098 [52/52], PF2107 [52/52], PF2109 [52/52], PF2110 [52/52], PF2111^R [52/52], PF2112 [50/52], PF2113 [52/52], PF2117 [52/52], PF2118 [52/52], PF2119 [51/52], PF2122 [52/52], PF2124 [52/52], PF2147 [52/52], PF2155/CTS8002^R [52/52], PF2176 [52/52], PF2177^R [52/52], PF2179 [52/52], PF2181 [52/52], PF2202 [52/52]

²¹ CTS1847, CTS3576, CTS10659, CTS10914, CTS11732, CTS12659, L86, M180 and P182 also found in nearby clade E1b1a1a (line 343 on this page). One set of instances may be erroneous. Further investigation required.²² The algorithm behind the 17 July 2013 version of this report did not distinguish between M35.1 and M35.2, leading to errors in that version's phylogeny downstream of E1b1b1.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

406 → 87 non-Geno kits requiring further testing; 57904
 407 → E1b1b1a1a Z1216/V12 [23/23] (between E1b1b1a1a and E1b1b1a1a-1: CTS1833 [5/5], CTS3073 [5/5], CTS3578 [5/5], CTS5254 [5/5], CTS5412 [5/5], CTS7017 [5/5],
 CTS7136 [5/5], CTS9007 [5/5], CTS12019 [5/5])
 408 → 12072*, 24694*, 253799, 26832*, 30634*, 34322*, 38059*, 45555*, 51660*, 56764*, 60037*, 61958*, 63753*, N13879*
 409 ?→ E1b1b1a1a1 M224
 410 ?→ E1b1b1a1a2 V32 [5/5]
 411 └→ 117376, 232189, M5062, N14436, N46664
 412 → E1b1b1a1a-1 CTS693 [4/4], CTS3346 [4/4], CTS3553^R [4/4], CTS4005 [4/4], CTS6244 [4/4], CTS6667 [4/4], CTS8415 [4/4], F3599^R [4/4]
 413 → E1b1b1a1a-1-1△ F2238 [2/2]
 414 → E1b1b1a1a-1-1-1 PF4341^R [1/1]
 415 └→ N9771
 416 → E1b1b1a1a-1-1-2 CTS661^R [1/1], L1272 [1/1] (no nearby negative results)
 417 └→ N80041
 418 → E1b1b1a1a-1-2△ F4010^R [1/1]
 419 └→ M7175
 420 → E1b1b1a1a-1-3 Z1902 [1/1]
 421 └→ 52277
 422 → E1b1b1a1c CTS2548 [6/6], CTS2817 [6/6], CTS5479 [6/6], CTS6434 [6/6], CTS8892 [6/6], L677/CTS9547 [11/11], V22 [33/33]
 423 → 130655*, 31320*, 32460*, 38122*, 40797*, 45231*, 45617*, 48104*, 48842*, 52849*, 54449*, 58684*, 6082*, 61897*, 68731*, 70198*, 7765*, 82419*, N105559, N18123*,
 N21917*, N23469*, N27248*, N29952, N33344*, N37624*, N48458*, N5894*, N73767*, N88713
 424 ?→ E1b1b1a1c1 M148
 425 ?→ E1b1b1a1c2 V19
 426 ?→ E1b1b1a1c3 L674, L675
 427 → E1b1b1a1c-1 CTS6080 [2/2], CTS11457 [2/2]
 428 └→ 256785, N46362
 429 → E1b1b1a1c-2 CTS11145^R [1/1]
 430 └→ N82940
 431 → E1b1b1a1d CTS5168 [1/1], CTS6672 [1/1], CTS7589 [1/1], CTS8686 [1/1], CTS9060 [1/1], CTS9879 [1/1], CTS10414 [1/1], CTS11387 [1/1], CTS11582 [1/1],
 L67/PF2267 [1/1], PF2159 [1/1], PF2253 [1/1], PF2254^R [1/1], PF2255 [1/1], PF2257 [1/1], PF2258 [1/1], PF2259 [1/1], PF2262 [1/1], PF2263 [1/1], PF2272/V65
 [6/6], PF2274 [1/1], PF2276 [1/1], PF2286 [1/1], PF2287 [1/1], PF2290 [1/1], PF2293 [1/1]
 432 → 51746*, E2530*, N112481, N19276*, N30296*
 433 ?→ E1b1b1a1d-1²³ L69/S163 [1/1] (no nearby negative results), L337^R [1/1] (no nearby negative results)
 434 └→ 172234
 435 ?→ E1b1b1a1e M521
 436 └→ E1b1b1a1-1 CTS1773 [40/40], CTS1975 [40/40], CTS3287 [40/40], CTS5291 [40/40], CTS5527 [40/40], CTS7273 [40/40], CTS10912 [40/40], CTS11953 [40/40], L618^R
 [49/49], PF2121 [40/40], PF2215 [40/40], PF2219 [40/40], PF2246 [40/40] (Cannot resolve: P29/PF1643 [40/40], P150/PF1704 [40/40], P152/PF1646 [40/40],
 P155/PF1687 [40/40], P162/PF1496 [40/40], P169/PAGE54 [40/40], P171/PF1903 [40/40], P172/PF1510 [40/40], P176/PF1678 [40/40], Z1919 [2/2], Z1920 [3/3])
 437 └→ 202724, 220004, N15407
 438 └→ E1b1b1a1b L142 [32/32], L542/PF2220 [55/55], PF2210/V36 [140/140], PF2211/V13 [157/158] (between E1b1b1a1b and E1b1b1a1b-1: CTS1273 [39/39], CTS2374
 [39/39], CTS5371 [39/39], CTS5856 [39/39], CTS5935 [39/39], CTS6472 [39/39], CTS8061 [39/39], CTS9761 [39/39], PAGES00102 [42/42], PF2213 [39/39],
 PF2214 [39/39]) (Cannot resolve: L992 [9/9] (no nearby negative results), L1020 [2/9] (between E1b1b1a1b and E1b1b1a1b-1-7), L1024 [4/4] (between E1b1b1a1-1
 and E1b1b1a1b-1), PF2211/V13 [157/158] (no nearby negative results), PF2217 [37/39] (no nearby negative results), Z1896 [7/7] (between E1b1b1a1-1 and
 E1b1b1a1b-1))
 439 → 111 non-Geno kits requiring further testing; 208098*, N113244*
 440 ?→ E1b1b1a1b1 V27
 441 ?→ E1b1b1a1b2 P65
 442 ?→ E1b1b1a1b5 M35.2 [1/1]
 443 └→ 56091
 444 ?→ E1b1b1a1b7 L250, L251, L252
 445 ?→ E1b1b1a1b8 L540 [2/2]
 446 └→ 199446, N45041
 447 → E1b1b1a1b-1 PF2248 [37/37]
 448 → 12583*, 138702, 167532*, 169937, 201114, 210744*, 250067*, 257611*, N112372*, N113378*, N113671*, N16800, N19135*, N44130*, N86317, N89801*
 449 → E1b1b1a1b3 L17 [4/4]
 450 └→ 109889, 167154, 40329, N49571
 451 → E1b1b1a1b4 L143/DYS643-NULL [2/2]
 452 └→ 22762, 259807
 453 → E1b1b1a1b6 L241 [4/4]
 454 └→ 39430, 7263, N113872 (Duplicate call: PF2217. Suspected no-call for PF2217.), N49450
 455 → E1b1b1a1b-1-1△ CTS9320 [10/10]
 456 → 249674, 94142, N112923, N113984, N115194, N3913, N81878
 457 → E1b1b1a1b-1-1-1 U175^R [1/1]
 458 └→ N80425
 459 → E1b1b1a1b-1-1-2 PF7506^R [1/1]
 460 └→ N9122
 461 → E1b1b1a1b-1-1-3 L759^R [1/1]
 462 └→ N45310
 463 → E1b1b1a1b-1-2△ CTS1489^R [1/1]
 464 └→ 152763
 465 → E1b1b1a1b-1-3²⁴ CTS11991^R [1/1] (no nearby negative results), L337^R [1/1] (no nearby negative results), PF1587 [1/1] (no nearby negative results), PF1917 [1/1],
 PF1919 [1/1], PF1920 [1/1] (no nearby negative results), PF1921 [1/1], PF1923 [1/1], PF1924 [1/1], PF6009^R [1/1] (no nearby negative results)
 466 └→ 186136
 467 → E1b1b1a1b-1-4△ CTS10889^R [1/1]
 468 └→ N11517
 469 → E1b1b1a1b-1-5△ L930 [1/1] (no nearby negative results)
 470 └→ 169748
 471 → E1b1b1a1b-1-6△ Z867 [1/1] (no nearby negative results)
 472 └→ 211910
 473 → E1b1b1a1b-1-7△ L1019 [2/2]
 474 └→ 109163, 89943 (Duplicate call: Z1896. Presumed Z1896+.)
 475 → E1b1b1b Z827/CTS1243 [39/39] (Cannot resolve: CTS8182 [20/33], PF2002 [18/33])

²³ L337 also found in nearby clade E1b1b1a1b-1-3 (line 465 on this page). One set of instances may be erroneous. Further investigation required.²⁴ L337 also found in nearby clade E1b1b1a1d-1 (line 433 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.²⁵ M123 also found in nearby clade E1b1b1b2a (line 506 on this page). One set of instances may be erroneous. Further investigation required.²⁶ M123 also found in nearby clade E1b1b1b-2 (line 503 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

535 | └→ **N95105**
536 | └→ **E1b1b1b2a1d-2**△ **F180**^R [1/1], **PF27**^R [1/1]
537 | └→ **152409**
538 | └→ **E1b1b1b2a1d-3** **Z853** [2/2] (no nearby negative results)
539 | └→ **82291**
540 | ?└→ **E1b1b1b2a1d-3-1** **Z841** [1/1] (no nearby negative results), **Z851** [1/1] (no nearby negative results)
541 | └→ **206360**
542 | └→ **E1b1b1b2a1-1** PF5621/CTS4201 [1/1], **PF6755** [1/1]
543 | └→ **N65401**
544 | └→ **E1b1b1b2a-1** **F666** [1/1], **L539**^R [1/1], **PF3247**^R [1/1]
545 | └→ **N18270**
546 | └→ **E1b1b1b2a-2** **F42**^R [1/1], **PF4428** [1/1]
547 | └→ **N114331**
548 ?└→ **E1b1b1b2b** M293
549 | └→ **E1b1b1b2b1** P72
550 ?└→ **E1b1b1b2c** V42
551 ?└→ **E1b1b1c** V6
552 ?└→ **E1b1b1d** V92

C

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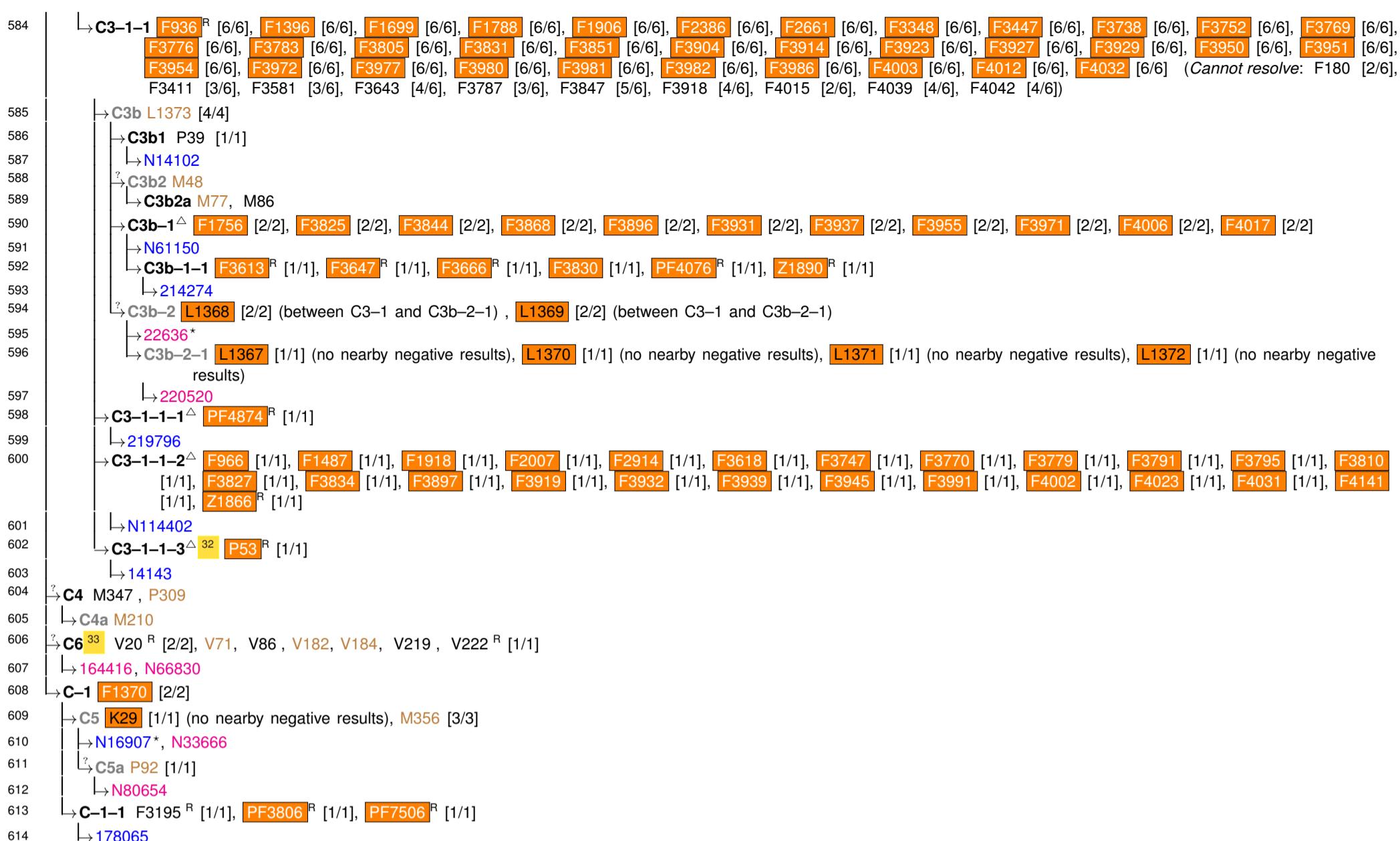
²⁷ P255 and P260 also found in nearby clade C3e1 (line 575 on this page). One set of instances may be erroneous. Further investigation required.

²⁸ P₂₅₅ and P₂₆₀ also found in nearby clade C3e1 (line 575 on this page). One set of instances may be erroneous. Further investigation required.

²⁹ V53 also found in nearby clade C5-1-1-3 (line 602 on page 18). One set of instances may be erroneous. Further investigation required.

³⁰ V222 also found in nearby clade C6 (line **606** on page **16**). One set of instances may be erroneous. Further investigation required.

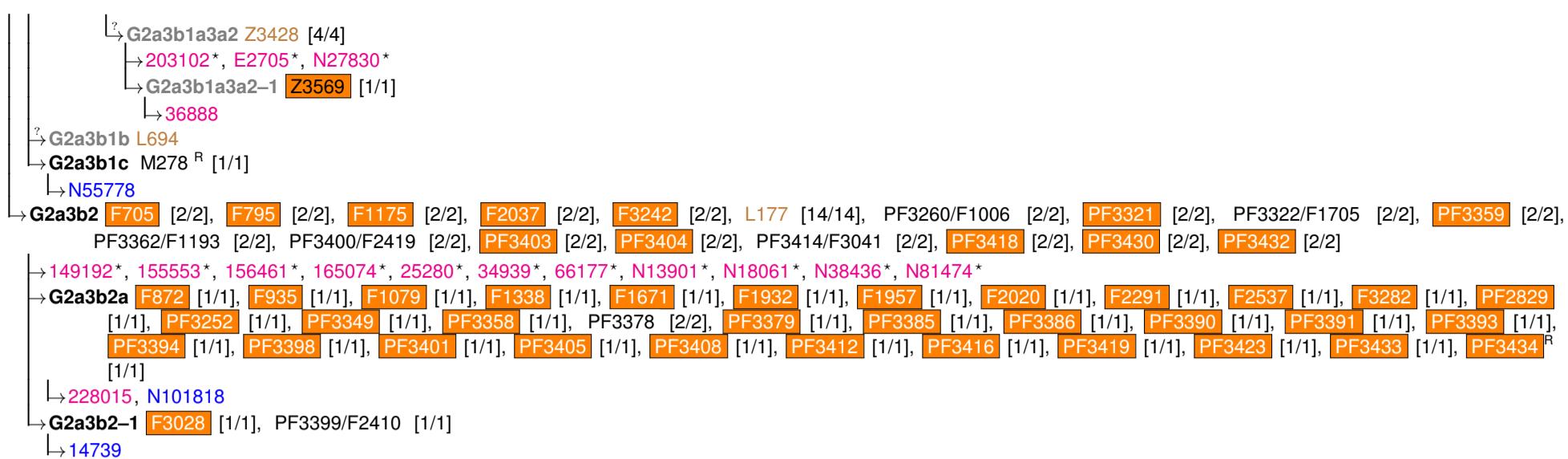
³¹ P255 and P260 also found in nearby clade C (line 553 on this page). One set of instances may be erroneous. Further investigation required.

**G2a**

Continued from above (line 163 on page 10)

³² P53 also found in nearby clade C3c (line 565 on page 17). One set of instances may be erroneous. Further investigation required.³³ V20 also found in nearby clade C3c-1 (line 566 on page 17). V222 also found in nearby clade C3c-1-1 (line 568 on page 17). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.³⁴ U1 also found in nearby clade G2a3b1a1a1-1 (line 673 on this page). One set of instances may be erroneous. Further investigation required.³⁵ U1 also found in nearby clade G2a3b1a1 (line 667 on this page). One set of instances may be erroneous. Further investigation required.³⁶ L1266 also found in nearby clade G2a3b1a1b (line 685 on this page). One set of instances may be erroneous. Further investigation required.³⁷ L1266 also found in nearby clade G2a3b1a1a1-2 (line 677 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.**I1a**

Continued from above (line 192 on page 11)



Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

789 → I1a1-2³⁸ L341^R [1/1] (no nearby negative results), L347^R [1/1]
 790 → 80366
 791 → I1a2³⁹ Z58/S244^R [116/169]
 792 → I1a2a Z59/S246 [116/116] (Cannot resolve: Z2038 [7/8] (between I1a2a and I1a2a2) , Z2040 [6/8])
 793 → 115489*, 116063*, 204482, 34795*, 6946*, 8867*, 99068*, E14592*, N11115*, N41413*
 794 → I1a2a2 Z382 [13/13] (Cannot resolve: L41/PF3787 [2/4], Z2037 [5/5] (between I1a2a and I1a2a))
 795 → 109153, 12479 (Unexpected negative call: P305- [13 levels above, at A1].), 126235, 177965, 185549, 209568, 47918, 54701, 70702, 84232, N48216, N51023, N5994
 796 → I1a2a-1[△] CTS8647 [53/54]
 797 → N112475, N6262
 798 → I1a2a1 Z60/S337 [88/89], Z61/S439 [9/9], Z62 [20/62] (Cannot resolve: L345 [3/3] (no nearby negative results))
 799 → I1a2a1-1 Z2539/CTS7362 [6/15] (Cannot resolve: CTS9352 [8/13], CTS9477 [8/13], Z62 [7/16])
 800 → 248559*, 259249*, 2807*, N17209*
 801 → I1a2a1b L1301 [13/13], Z73 [19/19] (between I1a2a1b and I1a2a1b-1: CTS743 [6/6], CTS1679 [6/6])
 802 → 119663, 211404, 243841, 249759*, 29024, N113313, N38072, N4142, N42696*
 803 → I1a2a1b-1 L41/PF3787^R [1/1], L1302 [10/10]
 804 → 121192, 154151 (Unexpected negative call: M91- [15 levels above, at BT].), 181820, 186200, 192971, 197789, 252396, N15620, N38671, N56200
 805 → I1a2a1c L573 [4/4]
 806 → 170291, 236837, 256129, 34733 (Unexpected negative call: L69- [10 levels above, at IJK].)
 807 → I1a2a1d L1248 [4/4]
 808 → 221283, 73056*
 809 → I1a2a1d1 L803 [3/3]
 810 → I1a2a1d1-1[△] L802 [1/1]
 811 → 64529
 812 ?→ I1a2a1d1-2 L1247 [2/2]
 813 → 16435, 75654
 814 → I1a2a1-1-1[△] PF3158 [1/1]
 815 → N35383
 816 → I1a2a1-2
 817 → 237019*, 238231, N112818, N114524, N29579, N49922*, N52850*
 818 → I1a2a1a Z140 [62/63], Z141 [48/50]
 819 → 105913*, 139871*, 1462, 150814*, 151651*, 172172*, 193611*, 197085*, 204984*, 226640*, 25496, 271837, 30435*, 56528, 57430*, 59689*, 79332*, 84275*, 93513*, 94611*, E12965*, N112436, N115018, N54667, N55400*, N62366
 820 → I1a2a1a2 F2642 [16/16]
 821 → 102847, 139862, 175791*(Unexpected negative call: L69- [11 levels above, at IJK].), 181482, 181577*, 19860*(Unexpected negative call: L69- [11 levels above, at IJK].), 222101*, 224491, 78646, 93343*, 9578, N112931, N81756, N92778*
 822 → I1a2a1a2-1 F2735^R [1/1]
 823 → 863
 824 → I1a2a1a2-2 PF6897^R [1/1]
 825 → 55063
 826 → I1a2a1a-1[△] YSC0000261 [15/16]
 827 → N112352*, N114863*, N63563*
 828 → I1a2a1a1 Z2535 [13/13]
 829 → N25881*
 830 → I1a2a1a1a L338 [22/23]
 831 → 146679*, 171239*, 210933*, 229688*, 25338*, 26508*, 29243, 32492, 38134*, 38985*, 39164*, 66263*, 95313, 98334*, B2385*, N19891, N37277, N50707*
 832 → I1a2a1a1a-1 L41/PF3787^R [3/3]
 833 → 118064, N68011*
 834 → I1a2a1a1a-1-1 Z382 [1/1], Z2037 [1/1] (between I1a2a and I1a2a)
 835 → 43947 (Unexpected negative call: Z60- [7 levels above, at I1a2a1].)
 836 → I1a2a1a1a-2 P268 [1/1]
 837 → N31467
 838 → I1a2a1a1a-3 PF1793^R [1/1]
 839 ?→ I1a2a1a1a-4 L340^R [1/1], L343^R [1/1], V218^R [1/1] (no nearby negative results)
 840 → 122567
 841 ?→ I1a2a1a1b Z2538/CTS10937 [5/5]
 842 → 117095*
 843 → I1a2a1a1b-1 Z2536 [4/4] (between I1a2a1a and I1a2a1b-1-1)
 844 → 185952*(Unexpected negative call: L69- [14 levels above, at IJK].)
 845 → I1a2a1a1b-1-1 Z2537 [3/3]
 846 → 11072, 120458, 202438
 847 → I1a2a1a-2[△] Z454^R [1/1]
 848 → N111030
 849 → I1a2a1a-3 L348^R [1/1]
 850 → 148528 (Duplicate call: L157 [8 levels above, at I1].)
 851 ?→ I1a2a1a-4[△] L592 [1/1]
 852 → 23492 (Unexpected negative call: L69- [11 levels above, at IJK].)
 853 → I1a2a1-2[△] L247^R [1/1]
 854 → B3499
 855 ?→ I1a2a1-2-2 Z2894 [2/2] (no nearby negative results)
 856 → 181479, 247759
 857 → I1a2a-1-1 F3916 [2/2]
 858 → 285716, N114305
 859 → I1a2a-2[△] PF856^R [1/1]
 860 → 237311
 861 ?→ I1a2a-3[△]⁴⁰ L341^R [1/1] (no nearby negative results)
 862 → 42736
 863 → I1a2b Z138/S296 [40/40], Z139 [36/36] (Cannot resolve: L211 [2/21] (no nearby negative results), Z2540 [14/14] (between I1a2 and I1a2b1-1))
 864 → 152077*, 195628*, 249295*, 268137*, 52010*, 72690*, 742*, 94810*, N113262*, N113969*, N114766*, N18619*, N41751*, N69770*(Unexpected negative call: Z58- [1 level above, at I1a2].)

³⁸ L341 also found in nearby clade I1a2a-3 (line 862 on page 21). One set of instances may be erroneous. Further investigation required.³⁹ Z58 also found in nearby clade I1a2b1-1 (line 868 on page 22). One set of instances may be erroneous. Further investigation required.⁴⁰ L341 also found in nearby clade I1a1-2 (line 789 on this page). One set of instances may be erroneous. Further investigation required.

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866 → I1a2b1 Z2541 [9/17]
 867 |→ N112406
 868 |→ I1a2b1-1⁴¹ Z58/S244^R [29/29]
 869 | → 101902*, 128312*, 144176 (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), 151617, 186577, 219867*, 22666*, 27308*, 30384* (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), 40638* (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), 5561*, 6550*, 7001*, 7121, 8319*, 85047 (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), 85669* (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), 923*, B2520*, E14854, E2377*, N2940*, N32687* (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), N38648*, N47000*, N5004 (Unexpected negative call: Z2541- [1 level above, at I1a2b1].), N7250* (Unexpected negative call: Z2541- [1 level above, at I1a2b1].)
 870 | ?→ I1a2b1-1-1 L343^R [2/2]
 871 | → 16855*
 872 | → I1a2b1-1-1-1 L340^R [1/1]
 873 | → 143803
 874 |→ I1a2b-1[△] PF2364^R [1/1]
 875 | → 287017
 876 |→ I1a2b-2[△] F3754^R [1/1]
 877 | → N114804
 878 → I1a3 Z63/S243 [38/38]
 879 → 112268, 148532, 173757, 187422, 201061, 211045*, 223698, 263284, 270328, 280240, 48539*, 50559*, 56147*, 6715, 88190, 92519*, 99247, 99448, B1493, N10705, N112685, N113540, N11902*, N15874, N16531, N27671*, N34614*, N35444, N3626, N65497, N80204
 880 → I1a3a CTS7416 [1/1], L1237 [7/7]
 881 | → 167703, 16934, 211835, 49061, 7186, 84393, N42570
 882 → I1a-1 L343^R [1/1]
 883 | → 75432
 884 → I1a-2 PF49^R [1/1]
 885 | → B1566

I2a

Continued from above (line 201 on page 11)

886 I2a L460/PF3647/S238 [146/146], PF3573 [141/141], PF3876 [141/141]
 887 → I2a1⁴² CTS410 [63/63], CTS5044 [63/63], P37^R [188/188], PF3606^R [63/63], PF3638 [63/63], PF3966 [63/63], PF4058 [63/63] (Cannot resolve: CTS595 [23/63], L1286 [2/3], L1287 [2/2] (no nearby negative results), PF3945 [62/63] (no nearby negative results))
 888 → 45 non-Geno kits requiring further testing; 15183 (Duplicate call: P37 [at this level].), H1010
 889 → I2a1a⁴³ CTS1049 [18/18], CTS1272 [18/18], CTS3353 [18/18], CTS5932 [18/18], CTS6027 [18/18], CTS7373 [18/18], CTS7671 [18/18], CTS10400 [18/18], CTS11143 [18/18], CTS11548 [18/18], L158/PF4073/S433 [26/26], L159/S169 [14/14], M26/PF4056 [52/52], PF3576 [18/18], PF3577 [18/18], PF3584 [18/18], PF3609 [18/18], PF3865 [18/18], PF3875 [18/18], PF3962 [18/18], PF3963 [18/18], PF3965 [18/18], PF3968 [18/18], PF3969 [18/18], PF3971 [18/18], PF3972 [18/18], PF3973 [18/18], PF3975 [18/18], PF3977 [18/18], PF3978 [18/18], PF3980 [18/18], PF3988^R [18/18], PF4046 [18/18], PF4047 [18/18], PF4048 [18/18], PF4050 [18/18], PF4061 [18/18], PF4069 [18/18], PF4075 [18/18], PF4076^R [18/18], PF4079 [18/18], PF4080 [18/18], PF4098 [18/18] (Cannot resolve: CTS1132 [17/18], CTS1448 [17/18], CTS8968 [17/18], CTS10546 [17/18], CTS11766 [17/18], CTS12060 [17/18], L672/S327 [3/5] (inconsistent results: mixed calls in I2a1a, I2a1a-1), L1300 [3/3] (no nearby negative results), PF3587 [17/18] (no nearby negative results), PF3610 [17/18] (no nearby negative results), PF3614 [17/18] (no nearby negative results), PF3818 [17/18] (no nearby negative results), PF3848 [17/18] (no nearby negative results), PF3863 [17/18] (no nearby negative results), PF3947 [17/18] (no nearby negative results), PF3981 [17/18] (no nearby negative results), PF3983 [17/18] (no nearby negative results), PF3984 [17/18] (no nearby negative results), PF3985 [17/18] (no nearby negative results), PF3992 [17/18] (no nearby negative results), PF3999 [17/18] (no nearby negative results), PF4000 [16/18] (no nearby negative results), PF4043 [17/18] (no nearby negative results), PF4049 [17/18] (no nearby negative results), PF4074 [17/18] (no nearby negative results), Z2050 [4/4] (no nearby negative results), Z2051 [3/3] (no nearby negative results), Z2052 [2/2] (no nearby negative results))
 890 → 10685*, 107380*, 16655*, 17693 (Unexpected negative call: L69- [6 levels above, at IJK]. Duplicate call: P37 [1 level above, at I2a1].), 222612, 23992*, 28581*, 31374*, 32344*, 34710*, 34886*, 47343*, 57662*, 64187*, 68445*, 75521*, 78352*, 92494*, E9029*, N112565, N115849, N17075*, N24943*, N5775*
 891 → I2a1a1 CTS2111 [11/11], CTS6406 [11/11], CTS7201 [11/11], CTS8038 [11/11], CTS9062 [11/11], CTS11229 [11/11], CTS11972 [11/11], L160/PF4013^R [27/27], PF4053 [11/11], PF4060 [11/11], PF4086 [11/11], PF4089 [11/11], PF4096 [11/11]
 892 → 105953*, 109346*, 22499*, 41616*, 60691*, 87577*, N14320*, N14521*, N40127*, N4350*, N49620*
 893 → I2a1a1-1[△] PF4088 [9/9]
 894 → B3288, E15593
 895 → I2a1a1-1-1[△] CTS11338 [6/6], Z105 [6/6], Z120 [6/6]
 896 → I2a1a1-1-1-1 PF4189 [3/3]
 897 | → 80598 (Duplicate call: P37 [5 levels above, at I2a1].)
 898 | → I2a1a1-1-1-1-1 PF4190 [2/2], PF4193 [2/2], PF4195 [2/2]
 899 | → I2a1a1-1-1-1-1-1 PF4213 [1/1], PF4218 [1/1], PF4220 [1/1], PF4221 [1/1], PF7067 [1/1]
 900 | → N115309 (Duplicate call: PF4000. Suspected no-call for PF4000.)
 901 | → I2a1a1-1-1-1-1-2 PF4293 [1/1], PF4294 [1/1], PF4350 [1/1], PF4390 [1/1], PF4391 [1/1], PF4393 [1/1], PF4394 [1/1], PF4395 [1/1], PF4396 [1/1], PF4398 [1/1]
 902 | → 183699 (Duplicate call: P37 [7 levels above, at I2a1].)
 903 | → I2a1a1-1-1-2 CTS787 [3/3], CTS5139 [3/3], Z98 [3/3], Z99 [3/3], Z102 [3/3], Z106/S294 [7/7], Z109 [3/3], Z111 [3/3], Z112^R [3/3], Z113 [3/3], Z114 [3/3], Z115 [3/3], Z118 [5/5], Z119 [3/3], Z124 [3/3], Z125^R [3/3], Z127 [3/3], Z130 [3/3]
 904 | → 107259*, 176558, 237859*, 96401*, N13841 (Duplicate call: P37 [5 levels above, at I2a1].), N20700*
 905 | → I2a1a1-1-1-2-1 V218^R [1/1] (no nearby negative results), Z126 [1/1]
 906 | → 40308 (Duplicate call: P37 [6 levels above, at I2a1].)
 907 | → I2a1a1-1-2 L1299 [1/1]
 908 | → 110417 (Duplicate call: P37 [4 levels above, at I2a1].)
 909 | → I2a1a1-2[△] F1295 [2/2]
 910 | → I2a1a1-2-1 F1636^R [1/1]
 911 | → N45061 (Duplicate call: P37 [4 levels above, at I2a1].)
 912 | → I2a1a1-2-2 PF6950 [1/1]
 913 | → N9918 (Duplicate call: P37 [4 levels above, at I2a1].)
 914 | ?→ I2a1a1-3⁴⁴ L673 [1/1] (between I2a1 and I2a1a)
 915 | → N16683
 916 | → I2a1a-1⁴⁵ F1915^R [1/1], L247^R [1/1], L277 [1/1], L673 [2/2] (between I2a1 and I2a1a), YSC0000078^R [1/1]
 917 | → 115555, 145095 (Duplicate call: P37 [2 levels above, at I2a1].)

⁴¹ Z58 also found in nearby clade I1a2 (line 791 on page 21). One set of instances may be erroneous. Further investigation required.

⁴² Kit H1010 has 1 positive SNP from the I2a1-1-1 level (line 966 on page 23). Further investigation is required.

⁴³ Results for M707 have been discarded.

⁴⁴ L673 also found in nearby clade I2a1a-1 (line 916 on this page). One set of instances may be erroneous. Further investigation required.

⁴⁵ L673 also found in nearby clade I2a1a1-3 (line 914 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.⁴⁶ M267 also found in nearby clade I2a1b3a-2-2 (line 951 on this page). One set of instances may be erroneous. Further investigation required.⁴⁷ M267 also found in nearby clade I2a1b3a-2-1-1 (line 947 on this page). One set of instances may be erroneous. Further investigation required.

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↳ I2a2a1a1a-4⁴⁸ L1316^R [1/1] (no nearby negative results)
 ↳ 115825
 ↳ I2a2a1a1b L1193 [7/7]
 ↳ 177544, 33688, 38767, 58341, 61893, N11848, N25557
 ↳ I2a2a1a-1△ L1194 [1/1]
 ↳ N34090
 → I2a2a1b L1229 [21/21] (Cannot resolve: Z2083 [2/2] (between I2a2a-1 and I2a2a1b1-4), Z2089 [2/2] (between I2a2a-1 and I2a2a1b2), Z2091 [2/2] (no nearby negative results), Z2093 [2/2] (between I2a2a1 and I2a2a1b1-4), Z2094 [3/3] (no nearby negative results), Z2095 [2/2] (no nearby negative results), Z2100 [3/3] (between I2a2a1 and I2a2a1b1-1), Z2101 [6/8])
 → 183375*, 213861, 27192*, 4962*, 85751*, E2498*
 → I2a2a1b1 Z2054 [13/13] (Cannot resolve: Z2055 [2/2] (between I2a2a1 and I2a2a1b1-4), Z2077 [2/2], Z2080 [2/2])
 → 11383*, 202943, 70989*, N20018*
 → I2a2a1b1a L812/S391 [6/6]
 ↳ 150778*, 169607*, 274551, 35315*, N112800
 ↳ I2a2a1b1a-1 Z2072 [1/1]
 ↳ N9738
 ↳ I2a2a1b1-1△⁴⁹ L1316^R [1/1] (no nearby negative results)
 ↳ 229001
 ↳ I2a2a1b1-2△ Z2064 [1/1], Z2066 [1/1], Z2067 [1/1]
 ↳ N62030
 ↳ I2a2a1b1-3△ Z2086 [1/1], Z2087 [1/1], Z2088 [1/1]
 ↳ 219446
 ↳ I2a2a1b1-4△ L1409 [1/1] (no nearby negative results), Z2062 [1/1]
 ↳ 214599
 ↳ I2a2a1b1-5△ Z2075 [1/1]
 ↳ N2001
 ↳ I2a2a1b1-6△ Z2058 [1/1]
 ↳ 56652
 ↳ I2a2a1b2 L1230 [1/1], Z2084 [1/1], Z2085 [1/1]
 ↳ 48274
 ↳ I2a2a1b-1△ Z2059 [1/1], Z2061 [1/1], Z2069 [1/1], Z2074 [1/1], Z2081 [1/1]
 ↳ 95338
 ↳ I2a2a1b-2△ Z2070 [1/1]
 ↳ 137173
 → I2a2a1c CTS10057 [43/43], CTS10100 [43/43], Z162 [40/40], Z175 [40/40], Z181 [40/40], Z184 [40/40]
 → I2a2a1c1 L701 [8/8], L702 [10/10], PF6894^R [7/7], PF6897^R [7/7]
 → N113686*
 → I2a2a1c1a P78 [17/17] (Cannot resolve: L484 [10/10], L1443 [4/4])
 ↳ 159305, 173294, 194914, 283436, 32065, 44994, 46684, 54860, 72493, 74964, 95511, E12252, E1968, N42139, N52149, N62607, N86836
 → I2a2a1c1-1△ PF6896 [2/2], PF6899 [2/2], PF6902 [2/2]
 → I2a2a1c1b L699 [5/5], L703 [5/5]
 → 24276*, 95786, N42109
 → I2a2a1c1b1 L704 [2/2]
 → 201343
 → I2a2a1c1b1-1 L1226 [1/1]
 → 83425
 → I2a2a1c1-1-1 L700 [1/1]
 → N114142
 → I2a2a1c2 Z161 [66/66] (Cannot resolve: L1316 [14/14] (no nearby negative results), L1409 [9/9] (no nearby negative results))
 → 31781*, 46492*, N113589*, N23983*
 ↳ I2a2a1c2b L147^R [5/5], L623 [4/4]
 → 206275, 21888, 41141, 45401, 82024
 → I2a2a1c2-1△ CTS2392 [33/33], CTS4348 [33/33], CTS6136 [33/33], CTS7682 [33/33], CTS7934 [33/33], Z163 [33/33], Z164 [33/33], Z165 [33/33], Z168 [33/33], Z170 [33/33], Z174 [33/33], Z178 [33/33], Z179 [33/33], Z183 [38/38], Z188 [33/33]
 → I2a2a1c2a L801/S390 [67/67], Z172 [32/33], Z176 [32/33], Z177 [32/33] (Cannot resolve: L1272 [2/15] (no nearby negative results))
 → 19048*, 20326*, 59046*, 71102*, 80927*, 88410*, 97078*, N3505*, N45391*, N76807*
 → I2a2a1c2a1 CTS1977 [19/19]
 → 157321, 19416, 219697, 235511, 274431, 71560, 78983, 94261*, B1933, N114664, N16652*, N5605
 ↳ I2a2a1c2a1a P95 [2/2]
 → 122753, 12502
 → I2a2a1c2a1b CTS1858 [4/4]
 → 186923, 55254, N113005, N17176
 → I2a2a1c2a1-1 L1201 [1/1]
 → 65183
 → I2a2a1c2a2 CTS6433 [37/37] (Cannot resolve: L1409 [7/7] (no nearby negative results), V218 [8/8] (no nearby negative results), Z76 [25/25] (between I2a2a1c2 and I2a2a1c2a), Z185 [15/27] (between I2a2a1c2a2 and I2a2a1c2a2-1))
 → 102637, 124358*, 128255*(Unexpected negative call: L68- [10 levels above, at I2].), 148361*, 201831*, 205736*, 216400, 227692*, 28482*, 30789, 31269, 34519*, 76513*, 77830, N20850*, N52116*, N95564*
 → I2a2a1c2a2-1 Z171 [17/17], Z185 [15/16]
 → 206081
 → I2a2a1c2a2-1-1 Z166 [13/13], Z180 [11/11], Z187 [11/11]
 → 286151*, N113749*, N43604*, N96585*
 → I2a2a1c2a2a Z78 [25/25]
 → 123792, 14954*, 64043 (Unexpected negative call: Z185- [2 levels above, at I2a2a1c2a2-1].)
 → I2a2a1c2a2a1 L1198 [23/23]
 → 143455*, 144628*, 193789*, 217765*, 4381*, 53771*, 5559, 64997*, 72066*, N18172*, N20719*, N22636*, N3171*
 → I2a2a1c2a2a1a Z190 [7/7]
 → 181226, 216330, 22066, 6060, 89679
 → I2a2a1c2a2a1a1 Z79/S434 [5/5]
 → 105444, 165030, 173448, 17681, N113880
 → I2a2a1c2a2a1-1 F3195^R [1/1]
 → 127052 (Duplicate call: L147.)
 → I2a2a1c2a2a1-2 P195^R [1/1]
 → 177954

⁴⁸ L1316 also found in nearby clade I2a2a1b1-1 (line 1002 on page 24). One set of instances may be erroneous. Further investigation required.

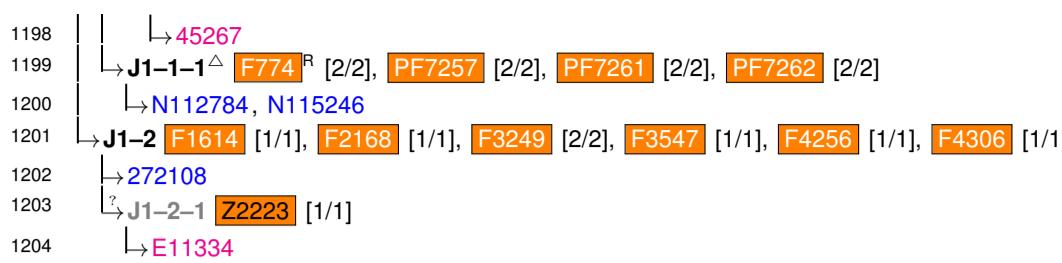
L1316 also found in nearby clade l2a2a1a1a-4 (line 988 on this page). One set of instances may be erroneous. Further investigation required.

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Continued from above (line 216 on page 11)

⁵⁰ V218 also found in nearby clade l2a2a2 (line 1089 on this page). One set of instances may be erroneous. Further investigation required.⁵¹ V218 also found in nearby clade l2a2a-1-1 (line 1087 on this page). One set of instances may be erroneous. Further investigation required.⁵² Kit 154480 has 1 positive SNP from the J1a-1 level (line 1120 on this page). Further investigation is required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.⁵³ Kit 193308 has 1 positive SNP from the J1a2b2-1-1-1 level (line 1156 on this page). Further investigation is required.⁵⁴ Kit M5020 has 1 SNP proposed by this tree to be at the J1a2b2-1-1-1 level (line 1156 on this page), but this kit lacks positive results for any ISOGG-recognised SNPs at this level.⁵⁵ Z643 also found in nearby clade J1a2b2-1-1-2-1 (line 1172 on this page). One set of instances may be erroneous. Further investigation required.⁵⁶ YSC0000076 also found in nearby clade J1a2b2-1-1-1 (line 1156 on this page). One set of instances may be erroneous. Further investigation required.⁵⁷ YSC0000076 also found in nearby clade J1a2b2a-3-1 (line 1150 on this page). One set of instances may be erroneous. Further investigation required.⁵⁸ Z643 also found in nearby clade J1a2b2-1-1-2-1 (line 1172 on this page). One set of instances may be erroneous. Further investigation required.⁵⁹ Z643 also found in nearby clade J1a2b2a-3 (line 1148 on this page). Z643 also found in nearby clade J1a2b2-1-1-4 (line 1164 on this page). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.**J2**

Continued from above (line 217 on page 11)

⁶⁰ Kit 122074 has 1 positive SNP from the J2a1-1-1-1-2 level (line 1315 on page 28). Further investigation is required.⁶¹ Kit 65789 has 1 positive SNP from the J2a1h2-3-2 level (line 1294 on page 28). Further investigation is required.⁶² L530 and L531 also found in nearby clade J2a1h2-2-1-3 (line 1259 on page 28). One set of instances may be erroneous. Further investigation required.⁶³ L530 and L531 also found in nearby clade J2a1h2-2-1-3 (line 1259 on page 28). One set of instances may be erroneous. Further investigation required.⁶⁴ Z273 also found in nearby clade J2a1h2-2-1-2-2 (line 1257 on page 28). One set of instances may be erroneous. Further investigation required.

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1257   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1258   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1259   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1260   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1261   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1262   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1263   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1264   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1265   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1266   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1267   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1268   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1269   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1270   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1271   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1272   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1273   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1274   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1275   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1276   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1277   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1278   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1279   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1280   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1281   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1282   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1283   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1284   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1285   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1286   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1287   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1288   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1289   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1290   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1291   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1292   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1293   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1294   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1295   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1296   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1297   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1298   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1299   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1300   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1301   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1302   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1303   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1304   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1305   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1306   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1307   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1308   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1309   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1310   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1311   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1312   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1313   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1314   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1315   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1316   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1317   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1318   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1319   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1320   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1321   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1322   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1323   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1324   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1325   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1326   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1327   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1328   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

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⁶⁵ Z273 also found in nearby clade J2a1h2–1–2–1–3 (line 1238 on this page). One set of instances may be erroneous. Further investigation required.

⁶⁶ L530 and L531 also found in nearby clade J2a1h2–1–2 (line 1227 on page 27). L530 and L531 also found in nearby clade J2a1h2d (line 1228 on page 27). One set of instances may be erroneous. Further investigation required.

⁶⁷ Kit N114556 has 1 positive SNP from the J2a1h2–3–1–1 level (line 1290 on this page). Further investigation is required.

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1401 | └→ 167433
 1402 | → J2b2 M241 [67/67] (between J2b2 and J2b2a-1: Z575 [12/12], Z586 [12/12], Z591 [12/12], Z593 [12/12], Z598 [12/12], Z599 [12/12], Z605 [12/12], Z610 [12/12], Z611 [12/12], Z620 [12/12], Z827 [12/12])
 1403 | → 10229*, 144714, 19597*, 22306*, 22609*, 26402*, 37164*, 39545*, 40921*, 48172*, 48518*, 50395*, 53787*, 57693*, 57880*, 64030*, 76347*, 77755*, 80011*, 9312*, 98135*, N112927, N21950*, N22392*, N23099*, N28421*, N32008*, N3325*, N3507*, N59555*
 1404 | → J2b2a L283 [37/37] (between J2b2a and J2b2a-1: CTS5382 [11/11], CTS5649 [11/11], Z576 [11/11], Z582 [11/11], Z584 [11/11], Z585 [11/11], Z587 [11/11], Z588 [11/11], Z589 [11/11], Z590 [11/11], Z594 [11/11], Z597 [11/11], Z607 [11/11], Z612 [11/11], Z615 [11/11], Z616 [11/11], Z617 [11/11], Z622 [11/11], Z628 [11/11])
 1405 | → 13462*, 202510*, 207846*, 217786*, 2446*, 5866*, 66138*, 69318*, 75983*, N49023*, N60270*
 1406 | → J2b2a-1 Z592 [9/11] (Cannot resolve: Z603 [8/11])
 1407 | → J2b2a-1-1 Z632 [6/9], Z634 [6/9], Z636 [6/9], Z1048 [9/13], Z1295 [6/9] (between J2b2a-1-1 and J2b2a1a1: Z638 [8/10])
 1408 | └→ J2b2a1 Z1296 [18/18] (between J2b2a-1-1 and J2b2a1a1: Z1043^R [10/14])
 1409 | → 107257, 182650*
 1410 | → J2b2a1a1 Z1297 [22/25], Z1298 [15/23]
 1411 | → 151029, 204181*, 245553*, 52986
 1412 | → J2b2a1a1-1 Z603 [7/7]
 1413 | → 4974, N112973, N113184, N113248 (Duplicate call: Z592 [5 levels above, at J2b2a-1]. Suspected no-call for Z592.), N114092, N42743
 1414 | → J2b2a1a1-1-1 PF3664^R [1/1]
 1415 | → N112484
 1416 | → J2b2a1a1-2 F3867^R [1/1]
 1417 | → N112782
 1418 | → J2b2a1a1-3 Z574^R [1/1]
 1419 | → 181776 (Unexpected negative calls: Z1043- [3 levels above, at J2b2a1], Z1048- [4 levels above, at J2b2a-1-1].)
 1420 | → J2b2a-1-2 CTS6190 [2/2]
 1421 | → N6065
 1422 | → J2b2a-1-2-1 L427^R [1/1]
 1423 | → N115288
 1424 | ?→ J2-1 L363 [1/1]
 1425 | → 62933
 1426 | ?→ J2-1 L363 [1/1]
 1427 | → 62933

N

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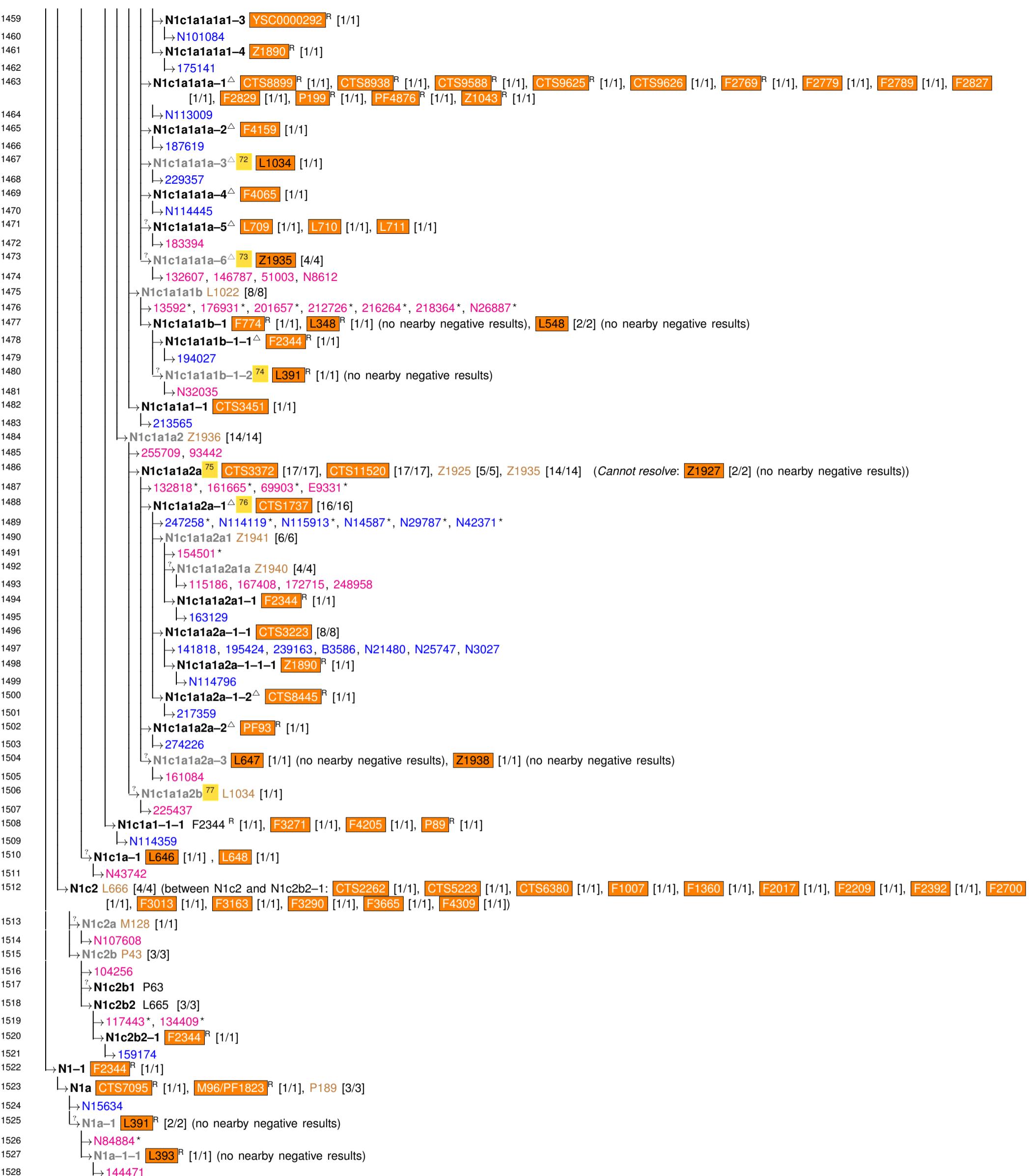
1428 N M231/PAGE91 [114/114] (between N and N1: CTS568 [56/56], CTS813 [56/56], CTS1653 [56/56], CTS2652 [56/56], CTS2947 [56/56], CTS3734 [56/56], CTS7433 [56/56], CTS8687 [56/56], CTS8893 [56/56], CTS10117 [56/56], F769 [53/56], F1052 [56/56], F1053 [56/56], F1061 [53/56], F1068 [56/56], F1257 [56/56], F1357 [56/56], F1359 [56/56], F1529 [56/56], F1715 [56/56], F1815 [56/56], F1951 [56/56], F2080 [56/56], F2088 [56/56], F2201 [56/56], F2509 [56/56], F2571 [56/56], F2692 [56/56], F2783 [55/56], F2919 [55/56], F2968 [56/56], F2981 [56/56], F2999 [56/56], F3108 [56/56], F3123 [56/56], F3227 [56/56], F3235 [56/56], F3299 [56/56], F3308 [56/56], F3426 [56/56], F3518 [56/56], F3641 [56/56], F3693 [56/56], F3694 [56/56], L394 [58/58], L667 [59/59], L734 [56/56], M232 [56/56])
 1429 | └→ N1 LLY22G [87/87]
 1430 | → N25315*, N33923*
 1431 | ?→ N1b L732 [2/2]
 1432 | → N1b1 L731 [1/1], L733 [1/1]
 1433 | → 217892
 1434 | → N1b-1⁶⁸ PAGES00056^R [1/1]
 1435 | → 224763
 1436 | → N1c⁶⁹ CTS5221 [55/55], CTS10907 [55/55], CTS11448 [55/55], CTS11710 [55/55], F963 [52/55], F1206 [55/55], F1427 [55/55], F1941 [55/55], F2049 [55/55], F2130 [55/55], F2156 [55/55], F2420 [55/55], F2552 [55/55], F2567 [55/55], F2598 [55/55], F3002 [55/55], F3094 [55/55], F3117 [55/55], F3312^R [55/55], F3436^R [55/55], F3485 [55/55], F3606 [55/55], L729 [16/16], L735 [55/55], PAGES00056^R [55/55]
 1437 | → N1c1 M46/PAGE70/TAT^R [1/54], P105 [39/39] (between N1c1 and N1c1a1-1: CTS439 [54/54], CTS622 [54/54], CTS10889^R [54/54], CTS11941 [54/54], F2049 [54/54], F3331 [54/54], F3354 [54/54], F3823 [54/54], L395 [56/56], L549 [59/59])
 1438 | └→ N1c1a M178 [150/152], P298 [53/54]
 1439 | → N1c1a1 L708 [67/68], L839 [12/12] (between N1c1a1 and N1c1a1-1: CTS1678 [53/54], CTS5631 [53/54], CTS6069 [53/54], CTS6336 [53/54], CTS6991 [53/54], CTS7404^R [53/54], CTS8346 [53/54], CTS10064 [53/54], F3573 [53/54], F4115 [53/54], F4218 [53/54], F4325 [53/54]) (Cannot resolve: CTS3103 [52/54], CTS4286 [52/54], CTS6967 [52/54], CTS7728 [51/54], CTS10082 [18/54], CTS10336 [52/54], CTS11612 [52/54], F4342 [52/54])
 1440 | → 120897*, 176781*, 193863*, N59644*
 1441 | → N1c1a1-1 F2996 [48/54]
 1442 | → N1c1a1a⁷⁰ L392^R [4/56], Z1973/L1026
 1443 | → N1c1a1a1 CTS10760 [33/36], VL29/CTS2929 [9/42]
 1444 | → 239158*, 268822*
 1445 | → N1c1a1a1a CTS8428 [26/34], L550/S431 [44/53], M46/PAGE70/TAT^R [1/34] (Cannot resolve: CTS9976 [5/34], L548 [8/8] (no nearby negative results), L647 [2/2] (no nearby negative results), L1022 [3/7] (between N1c1a1a1 and N1c1a1a1b-1-1))
 1446 | → 57 non-Geno kits requiring further testing; 147834, 19260*, 223703, 236032, 265510*, 270283*, 73958 (Unexpected negative call: L550- [at this level].), N107657*, N112969*, N113075*, N113506*, N56160*, N73880*, N83100*, N86056, N90103
 1447 | → N1c1a1a1a1 L1025 [23/23]
 1448 | → 103536*, 106620*, 145475*, 146476*, 149374, 149750, 150343*, 162926*, 193848, 205859, 53688*, 71583*, 87871*, E13080, N11423*, N58382*, N6569*, N9344*
 1449 | → N1c1a1a1a1a L149 [6/6], L551 [7/7]
 1450 | → 133144, 152916, 172770, 202123, 229569, E2635, N114750
 1451 | → N1c1a1a1a1b L591 [3/3]
 1452 | → 145128, 149454, 164888
 1453 | ?→ N1c1a1a1a1c L1027 [1/1]
 1454 | → 89280
 1455 | → N1c1a1a1a1-1⁷¹ L391^R [2/2] (no nearby negative results), L392^R [2/2], L393^R [2/2] (no nearby negative results), PF1406/V102^R [1/1]
 1456 | → 113355, 185414
 1457 | → N1c1a1a1a1-2[△] PF5535^R [1/1]
 1458 | → N95810

⁶⁸ PAGES00056 also found in nearby clade N1c (line 1436 on this page). One set of instances may be erroneous. Further investigation required.

⁶⁹ PAGES00056 also found in nearby clade N1b-1 (line 1434 on this page). One set of instances may be erroneous. Further investigation required.

⁷⁰ L392 also found in nearby clade N1c1a1a1a1-1 (line 1455 on this page). One set of instances may be erroneous. Further investigation required.

⁷¹ L392 also found in nearby clade N1c1a1a (line 1442 on this page). L391 also found in nearby clade N1c1a1a1b-1-2 (line 1480 on page 31). One set of instances may be erroneous. Further investigation required.

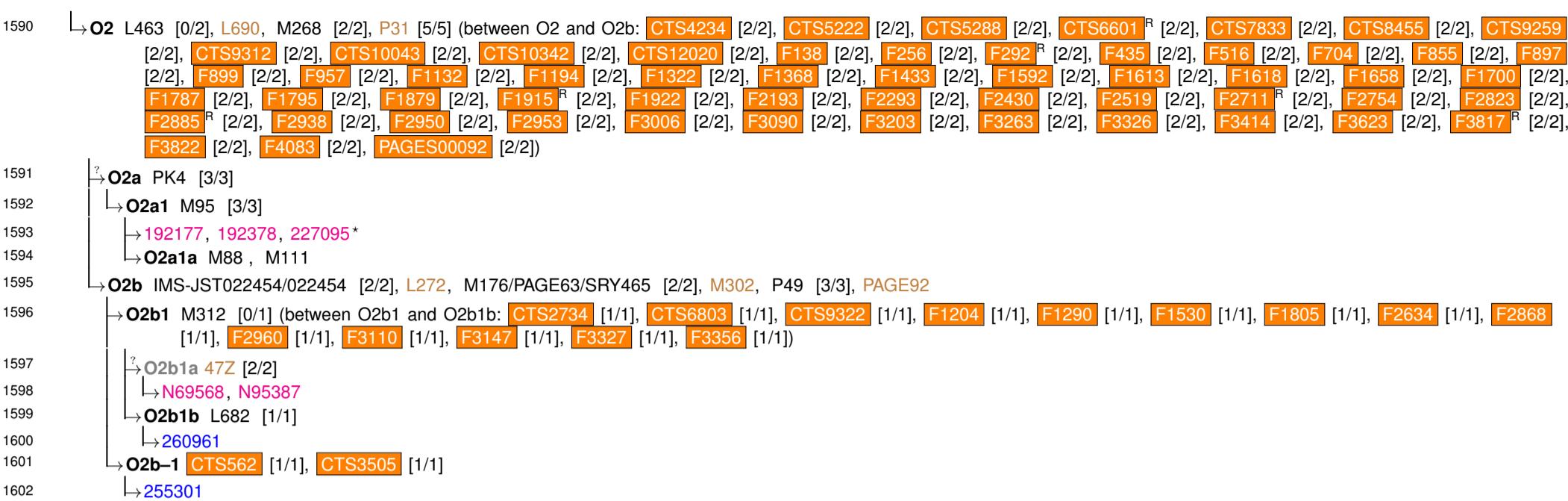
Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.

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1529 O CTS2340 [16/16], CTS3771 [16/16], CTS7942 [16/16], CTS8746^R [16/16], F171 [16/16], F175 [16/16], F182 [16/16], F282 [16/16], F355 [16/16], F380 [16/16], F478 [16/16], F494 [16/16], F537 [16/16], F540 [16/16], F546 [16/16], F600 [16/16], F614 [16/16], F668 [16/16], L101^R [15/16], M175 [18/18], P186 [16/16], P191 [16/16], P196 [16/16]

⁷² L1034 also found in nearby clade N1c1a1a2b (line 1506 on this page). One set of instances may be erroneous. Further investigation required.⁷³ Z1935 also found in nearby clade N1c1a1a2a (line 1486 on this page). One set of instances may be erroneous. Further investigation required.⁷⁴ L391 also found in nearby clade N1c1a1a1a-1 (line 1455 on page 30). One set of instances may be erroneous. Further investigation required.⁷⁵ Z1935 also found in nearby clade N1c1a1a1a-6 (line 1473 on this page). One set of instances may be erroneous. Further investigation required.⁷⁶ These kits have one or more positive SNPs known or proposed to be at the N1c1a1a2a1-1 level (line 1494 on this page): 247258 (1), N114119 (1), N14587 (1) and N42371 (1). Further investigation is required.⁷⁷ L1034 also found in nearby clade N1c1a1a1a-3 (line 1467 on this page). One set of instances may be erroneous. Further investigation required.

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**Q**

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- └─ 242869
- ? Q1a2-2 L932 [1/1] (no nearby negative results)
- └─ 49663
- └─ Q1b L275 [12/12], L314 [11/11], L606 [4/4], L612 [9/9] (between Q1b and Q1b1: F108^R [7/7], F803 [7/7], F815 [7/7], F1082 [7/7], F1126 [7/7], F1169 [7/7], F1205 [7/7], F1213 [7/7], F1337 [7/7], F1349 [7/7], F1528 [7/7], F1537 [7/7], F1594 [7/7], F1734 [7/7], F1780 [7/7], F1836 [7/7], F1839 [7/7], F1858 [7/7], F1875 [7/7], F1974 [7/7], F2023 [7/7], F2145 [7/7], F2230 [7/7], F2250 [7/7], F2313 [7/7], F2343 [7/7], F2440 [7/7], F2628 [7/7], F2657 [7/7], F2777 [7/7], F2851 [7/7], F2877 [7/7], F2894 [7/7], F2934 [7/7], F3084 [7/7], F3121 [7/7], F3193 [7/7], F3207 [7/7], F3389 [7/7], F3621 [7/7], F3680 [7/7])
- └─ 26360
- └─ Q1b1 L214 [11/11], L215/PAGE82/S325 [11/11], M378/PAGE100 [15/15]
- └─ 53682*
- └─ Q1b1a L245 [14/14]
- └─ 117351, 172625*, 173902*, 196332*, 208674*, 237760 (Duplicate call: P36 [3 levels above, at Q1].), 45731*, 50021*, M6760*, N63269*
- └─ Q1b1a1 L74^R [1/1] (no nearby negative results), L76^R [1/1] (no nearby negative results), L88^R [1/1], L272 [1/1]
- └─ 95307 (Duplicate call: P36 [4 levels above, at Q1].)
- └─ Q1b1a-1 F1748 [3/3]
- └─ 148637 (Duplicate call: P36 [4 levels above, at Q1].), E5340, N114044
- └─ Q1b1-1 L327 [1/1], PF5268^R [1/1]
- └─ 13254 (Duplicate call: P36 [3 levels above, at Q1].)

R1a

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1674 R1a CTS2907^R [156/156], CTS5164 [156/156], CTS8008 [156/156], CTS8851 [156/156], CTS9596 [156/156], CTS10627 [156/156], CTS11734 [156/156], F886 [156/156], F928^R [156/156], F1088 [156/156], F1769 [156/156], F2948 [156/156], F3364 [156/156], F3466 [156/156], F3570 [156/156], F3650 [152/156], L457/PF6191 [163/163], M420/L146/PF6229 [1/157], M449/L145/PF6175 [160/160], M511/L63/PF6203 [159/159], M513/L62/PF6200 [159/159], PF6215 [156/156]

1675 → 208954*

1676 → R1a1 M448/L122/PF6237 [185/185], M459/PF6235 [155/155], M516/L120, SRY10831.2/PAGE65/SRY1532^b [264/287] (between R1a1 and R1a1a1: CTS1619 [155/155], CTS3548 [155/155], CTS11411 [155/155], CTS11720 [155/155], F947 [155/155], F989 [155/155], F1050 [155/155], F1808 [155/155], F2215 [155/155], F2234 [155/155], F2684 [155/155], F2901 [155/155], F2957 [155/155], F3159 [155/155], F3185 [155/155], F3194 [155/155], F3337 [155/155], F3398 [155/155], F3551 [155/155], F4099 [155/155], PAGES00007 [156/156], PF6151 [155/155], PF6159 [155/155], PF6165 [155/155], PF6167 [155/155], PF6169 [155/155], PF6170 [155/155], PF6210 [155/155], PF6211 [155/155], PF6214 [155/155], PF6216 [155/155], PF6218 [155/155], PF7530 [155/155], PF7540 [155/155], PF7542 [155/155])

1677 → 155776, 73115*

1678 → R1a1a L168^R [163/163], L449 [13/13], M17 [191/191], M198/PF6238 [468/477], M512/PF6239 [155/155], M514 [1/1], M515

1679 └─ 171 non-Geno kits requiring further testing; N4203

1680 → R1a1a1 M417 [247/247], PAGE7 (Cannot resolve: CTS4385 [10/160], F3197 [153/155], F3644 [151/155])

1681 → 12624*, 259861, 65486*, 7295*, 73596*, 74896*, 75144*, 97870*, 99825*, E2587*, N18167*, N20835*, N4544*, N97469*

1682 → R1a1a1a L664/CTS7083/S298 [30/30]

1683 → 103641*, 106186, 129135, 131656*, 14769*, 177070*, 177896*, 210992, 228797, 228839, 26698*, 268077, 285021, 43111* (Unexpected negative call: SRY10831.2- [3 levels above, at R1a1]. Duplicate call: SRY10831.2 [3 levels above, at R1a1].), 54319*, 61821*, 66304, 6646*, 94990*, N23374*, N45073, N58810, N63702

1684 → R1a1a1a-1 F3647^R [2/2]

1685 → R1a1a1a-1-1 PF4076^R [1/1]

1686 └─ 177925

1687 → R1a1a1a-1-2 F3666^R [1/1], PF3123^R [1/1]

1688 └─ N112542

1689 → R1a1a1a-2 PF1273^R [1/1]

1690 └─ 232223

1691 → R1a1a1a-3 F131^R [1/1]

1692 └─ N17090

1693 → R1a1a1a-4 Z411^R [1/1]

1694 └─ 2374

1695 → R1a1a1a-5 F871^R [1/1]

1696 └─ N17700

1697 → R1a1a1a-6 F3682 [1/1]

1698 └─ N115143

1699 → R1a1a1b CTS5508 [136/136], CTS9754 [136/136], F3044 [136/136], PF6158 [136/136], PF6162 [136/136], Z645/S224, Z647/S441

1700 → R1a1a1b1 Z283/PF6217/S339 [126/127]

1701 → N50360

1702 → R1a1a1b1a Z282/S198 [119/119]

1703 → 104058*, 160159*, 166219, 182305*, 184708*, 235339*, 276357*, 44591*, 67981*, N101164*, N112606*, N114073*, N114353*, N115057*, N24773*

1704 → R1a1a1b1a1 M458/PF6241 [55/55], PF6155 [25/25], PF6161 [25/25], PF7521 [25/25]

1705 → 31257* (Unexpected negative call: SRY10831.2- [6 levels above, at R1a1]. Duplicate call: SRY10831.2 [6 levels above, at R1a1].), 46336*, 51291*, 85735*, 97050*, E2165*, N18946*, N21632*, N91823*

1706 → R1a1a1b1a1a L260/S222 [20/20]

1707 → 100432, 116518, 12044 (Unexpected negative call: SRY10831.2- [7 levels above, at R1a1]. Duplicate call: SRY10831.2 [7 levels above, at R1a1].), 125922, 182124, 22620 (Unexpected negative call: SRY10831.2- [7 levels above, at R1a1]. Duplicate call: SRY10831.2 [7 levels above, at R1a1].), 26734, 26769 (Unexpected negative call: SRY10831.2- [7 levels above, at R1a1]. Duplicate call: SRY10831.2 [7 levels above, at R1a1].), 270528, 31553 (Unexpected negative call: SRY10831.2- [7 levels above, at R1a1]. Duplicate call: SRY10831.2 [7 levels above, at R1a1].), 4623 (Unexpected negative call: SRY10831.2- [7 levels above, at R1a1]. Duplicate call: SRY10831.2 [7 levels above, at R1a1].), 53667, 79325, 85265, N10710, N108807, N30169, N3662, N60407, N77026

1708 → R1a1a1b1a1b CTS11962 [17/17]

1709 → 258906*, 284069*, 28429*, 40543*, N113970*, N115033*, N115074*, N115466*, N115772*

1710 → R1a1a1b1a1b1 L1029 [20/20]

1711 → 104772*, 116853*, 13191, 149610, 169127*, 170948*, 208920, 28992*, 5693*, 64924* (Unexpected negative call: L69- [15 levels above, at IJK].), 81980*, 97621*, N17829*, N21930*, N42486*, N4952*, N54385*, N75772

1712 → R1a1a1b1a1b1-1 CTS1366^R [1/1], CTS7141 [1/1], F672^R [1/1], Z1146/L797/PF2016^R [1/1]

1713 └─ N25798

1714 → R1a1a1b1a1b1-2 L388^R [1/1]

1715 └─ 176662

1716 → R1a1a1b1a1b1-1△ PF7600 [1/1]

1717 └─ N114137

1718 → R1a1a1b1a2 Z91/S204, Z280/S466 [89/89]

1719 → 142452, 57872*, 71994*, 83222*, 99643*, B1494, N18269*, N38097*, N49064*

1720 → R1a1a1b1a2a CTS456 [7/7], Z92/S205 [17/17], Z660/S344 [7/7], Z661/S446 [7/7]

1721 → 119581*, 147016*, 152881*, 152901*, 154400*, 175656*, 188231*, 188911, 217691*, 220225*, 91543*, B3619, N114882, N25399*

1722 → R1a1a1b1a2a-1△ CTS4314^R [1/1]

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1805
 1806 |→ R1a1a1b2a2a Z2123 [9/9]
 1807 | |→ 13091, 160543, 209969, 2914 (Unexpected negative call: SRY10831.1- [18 levels above, at BT.], 67603, M7030, M7180, N3798, N77532
 1808 |→ R1a1a1b2a2b Z2122 [11/11]
 1809 |→ 158380*, 179005*, 202698*, 221090*
 1810 |→ R1a1a1b2a2b1 F1345 [8/8], F2997 [6/6]
 1811 |→ 158657*
 1812 |→ R1a1a1b2a2b1a CTS6 [9/9] (between R1a1a1b2a2b1a and R1a1a1b2a2b1a-1: CTS3412 [7/7], CTS3605 [7/7], CTS8448 [5/5])
 1813 | |→ 114167*, 1155, 196865*, 266609*, 39003*, 6422, N114654, N16087
 1814 | |→ R1a1a1b2a2b1a-1 F3613^R [1/1], PF4341^R [1/1]
 1815 | |→ N113205
 1816 | |→ R1a1a1b2a2b1-1 F2935 [1/1]
 1817 | |→ 50283
 1818 | |→ R1a1a1b2a2b2 Y57 [2/2]
 1819 | |→ 223765, B1139
 1820 | ?→ R1a1a1b2a2b-1 PS7^R [1/1] (no nearby negative results)
 1821 |→ R1a-1 Z1866^R [1/1]
 1822 |→ N114240

R1b

Continued from above (line 320 on page 13)

1823 R1b⁷⁸ L278^R [935/936], M343/PF6242 [3398/3486], M415/PF6251^R [936/936] (between R1b and R1b1: CTS2134 [936/936], PF5466 [936/936], PF6246 [936/936], PF6250 [936/936], PF6270 [935/936], PF6272 [936/936], YSC0000075 [936/936])
 1824 |→ R1b1⁷⁹ L278^R [935/936], L506 [930/936], M415/PF6251^R [936/936], P25^F [2802/2802] (Cannot resolve: CTS3063 [935/936], CTS4244 [935/936], L754 [935/936], L761 [935/936], L774 [934/936], M343/PF6242 [3398/3486], PF6249 [935/936], PF6263 [935/936], PF6271 [935/936], YSC0000224 [935/936])
 1825 |→ 17563*, 34520*, 35767*, 46843*, 57176*, 57207*, 66198*, 67723*, N19380*, N4337*, N49650*
 1826 ?→ R1b1b M335
 1827 |→ R1b1c⁸⁰ PF6279/V88 [6/6] (between R1b1c and R1b1c-1: PF6281 [3/3], PF6287 [3/3], PF6289 [3/3], PF6290 [3/3], PF6292 [3/3], PF6293 [3/3], PF6295 [3/3], PF6304 [2/3], PF6305 [3/3], PF6307 [3/3], PF6310 [3/3], PF6324 [3/3], PF6327 [2/3], PF6328^R [3/3], PF6329 [3/3], PF6330 [3/3], PF6332 [3/3], PF6333 [3/3], PF6338 [3/3], PF6339 [3/3], PF6340 [3/3], PF6343 [3/3], PF6344 [3/3], PF6376 [3/3])
 1828 |→ 150747, 28424*, 40065 (Duplicate call: PF6327 [at this level]. Confirmed no-calls for PF6304 and PF6327.), 6307*, N37469*
 1829 ?→ R1b1c1 M18
 1830 ?→ R1b1c2 V35
 1831 ?→ R1b1c3 V69
 1832 |→ R1b1c-1 F1389 [1/1]
 1833 |→ N9149
 1834 |→ R1b1-1[△] L388^R [932/932], L389 [932/932]
 1835 |→ N16605
 1836 |→ R1b1a L320 [6/6] (between R1b1a and R1b1a2a: CTS623 [929/929], CTS2664 [929/929], CTS3575 [929/929], CTS5577 [927/929], CTS7400 [929/929], CTS7659 [929/929], CTS8591 [929/929], CTS8665 [929/929], CTS8728 [929/929], CTS10834 [929/929], CTS11468 [929/929], CTS11985 [929/929], CTS12478 [929/929], F1794 [928/929], L407 [928/929], L482 [928/929], L483 [929/929], L500 [929/929], L502 [929/929], L585 [929/929], L752 [929/929], L773 [929/929], PF6265 [929/929], PF6409 [929/929], PF6411 [929/929], PF6424 [929/929], PF6425 [929/929], PF6430 [929/929], PF6432 [929/929], PF6434 [929/929], PF6438 [924/929], PF6443 [929/929], PF6463 [928/929], PF6494 [929/929], PF6495 [929/929], PF6498 [929/929], PF6500 [929/929], PF6506^R [929/929], PF6507 [929/929], PF6509 [929/929], PF6524 [929/929], YSC0000072 [929/929], YSC0000166 [929/929], YSC0000194 [929/929], YSC0000203 [929/929], YSC0000213 [929/929], YSC0000219 [929/929], YSC0000225 [929/929], YSC0000269 [929/929], YSC0000294 [929/929])
 1837 ?→ R1b1a1 M73 [5/5], M478
 1838 |→ 100149*, 39685*, 67866*
 1839 |→ R1b1a1-1 PF6398/P297
 1840 |→ 249267, N75601
 1841 |→ R1b1a2 L265/PF6431 [929/929], M269 [3149/3149], M520, PF6399/S10, PF6485/S3, S13, S17
 1842 |→ 891 non-Geno kits requiring further testing; 101029, 2146, 46835, 65964, 66862, 999, N23148, N4522
 1843 |→ R1b1a2a L23/PF6534/S141 [1727/1732], L49/S349 [684/685]
 1844 |→ R1b1a2a-1 L478 [918/924], PF6404 [923/924]
 1845 |→ 26483*, N112959*, N113118*, N114022*, N18690*, N53795*, N79525*, N81217*, N9475*
 1846 |→ R1b1a2a1 M412/L51/PF6536/S167 [1/904]
 1847 |→ 105470*, 109760*, 111988*, 134706*, 143613*, 148406*, 185134*, 236058*, 41519*, 46468*, 49624*, 50168*, 52781*, 67450*, 80593*, 97317*, E2689*, E4861*, E5620*, N5273*, N60919*
 1848 |→ R1b1a2a1a L11/PF6539/S127 [1161/1161], L52/PF6541 [925/926], L151/PF6542 [916/916], P310/PF6546/S129 [1742/1745], P311/S128 [831/831], YSC0000082^F [899/899], YSC0000191 [899/899] (Cannot resolve: CTS6519 [5/899], CTS7141 [7/899], U106/M405/S21 [794/2882], YSC0000239 [3/899], Z225/S225 [14/929], Z229/S359 [12/913])
 1849 |→ 45 non-Geno kits requiring further testing; 109950*, 144416*, 160165*, 202807*, 221617*, 244207*, 246984*, 272429*, 281393*, 293407*, 90725*, B3027*, B3590*, B3630*, N108633*, N112350*, N112469*, N112880*, N112890*, N112979*, N113270*, N113291*, N113298*, N113369*, N113677*, N114363*, N114735*, N115011*, N29401*, N45113*, N89856*, N91624*, N93389*
 1850 |→ R1b1a2a1a1 See below (line 1926 on page 37).
 1851 |→ R1b1a2a1a2 P312/S116 [1616/1618] (Cannot resolve: Z2245 [5/8] (between R1b1a2a1a2 and R1b1a2a1a2d), Z2247 [5/7] (between R1b1a2a1a2 and R1b1a2a1a2d))
 1852 |→ 247 non-Geno kits requiring further testing; 104079, 134765*, 180710*, 191094*, 197578*, 26157*, 266463*, 27064*, 272715*, 277935*, 49328*, B3275*, N10903*, N24210*, N47555*, N94556*
 1853 |→ R1b1a2a1a2a See below (line 2113 on page 40).
 1854 |→ R1b1a2a1a2b See below (line 2212 on page 41).
 1855 |→ R1b1a2a1a2c See below (line 2322 on page 43).
 1856 ?→ R1b1a2a1a2d L238/S182 [5/5]
 1857 |→ 159829, 166369, 29135, 98393, N68759
 1858 |→ R1b1a2a1a2e DF19/S232 [32/32] (Cannot resolve: DF88 [4/4] (no nearby negative results))
 1859 |→ 148046*, 155152*, 173353*, 182243*, 196999, 228727*, 236298*, 254359*, 8585*, N114031, N114233*, N114374*, N115286*, N11543*, N15110*, N1857*, N43634, N46732*, N6609*, N74432*, N86827*
 1860 |→ R1b1a2a1a2e1 L644 [6/6]
 1861 |→ 181628*, 249457, 27045, 87210*, E4870*
 1862 |→ R1b1a2a1a2e1-1 L1063 [1/1] (no nearby negative results)

⁷⁸ L278 and M415 also found in nearby clade R1b1 (line 1824 on this page). One set of instances may be erroneous. Further investigation required.

⁷⁹ L278 and M415 also found in nearby clade R1b (line 1823 on this page). One set of instances may be erroneous. Further investigation required.

⁸⁰ See [here](#) and [here](#) for discussion on kit 40065's no-calls.

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1863 | | | | ↳ 86044
 1864 | | | | → R1b1a2a1a2e2 Z302/S233 [3/3]
 1865 | | | | ↳ 166103, 180696, B1536
 1866 | | | | → ? R1b1a2a1a2e3 L1199 [1/1], L1200 [1/1]
 1867 | | | | ↳ 112728
 1868 | | | | → R1b1a2a1a2e-1⁸¹ L1068^R [1/1] (no nearby negative results)
 1869 | | | | ↳ 93184
 1870 | | | | → R1b1a2a1a2-1[△] CTS7550^R [2/2], PF1085^R [2/2]
 1871 | | | | ↳ 123629, N115443
 1872 | | | | → R1b1a2a1a2-2⁸² CTS1841^R [1/1], PF4874^R [1/1]
 1873 | | | | ↳ N114442
 1874 | | | | → R1b1a2a1a2-3[△] CTS4528 [8/8]
 1875 | | | | → 16296 (Unexpected negative call: P312- [1 level above, at R1b1a2a1a2].), 248663, B3433, N112805, N24160 (Unexpected negative call: P312- [1 level above, at R1b1a2a1a2].), N4846
 1876 | | | | → R1b1a2a1a2-3-1 CTS2813 [1/1]
 1877 | | | | ↳ N115452
 1878 | | | | → R1b1a2a1a2-3-2 V43^R [1/1]
 1879 | | | | ↳ N113842
 1880 | | | | → R1b1a2a1a-1[△] PAGES00052^R [2/2]
 1881 | | | | ↳ 33281
 1882 | | | | → R1b1a2a1a-1-1 P65 [1/1] (no nearby negative results)
 1883 | | | | ↳ N114745
 1884 | | | | → R1b1a2a1a-2[△] F3571 [1/1]
 1885 | | | | ↳ 248180
 1886 | | | | → R1b1a2a1a-3[△] F2792^R [1/1]
 1887 | | | | ↳ B1522
 1888 | | | | → R1b1a2a1a-4 CTS1195 [1/1], CTS7354 [1/1], CTS10694 [1/1]
 1889 | | | | ↳ 211617
 1890 | | | | → R1b1a2a1a-5⁸³ CTS8340^R [1/1], F974^R [1/1], F1255 [1/1], F3436^R [1/1], L582^R [1/1], L618^R [1/1], PF1795^R [1/1], PF2177^R [1/1], PF3606^R [1/1], Z1146/L797/PF2016^R [1/1]
 1891 | | | | ↳ 273775
 1892 | | | | → R1b1a2a1a-6[△] CTS4287 [1/1], CTS6983 [1/1], PF2790^R [1/1]
 1893 | | | | ↳ N114196
 1894 | | | | → R1b1a2a1a-7[△] F664^R [1/1], F1899 [1/1], L560^R [1/1], PF312^R [1/1], PF6654 [1/1], V233^R [1/1]
 1895 | | | | ↳ N114451
 1896 | | | | → R1b1a2a1a-8[△] CTS9244 [1/1]
 1897 | | | | ↳ 227955
 1898 | | | | → R1b1a2a1-1 CTS6889 [4/4], PF7589 [4/4]
 1899 | | | | ↳ 22103, 231206, 250621, 252171
 1900 | | | | → R1b1a2a2 Z2103/CTS1078 [19/19], Z2105 [28/28]
 1901 | | | | → 127630*, 134236*, 140135*, 14386*, 145692*, 159888*, 164229*, 16910*, 185782*, 257842*, 47778*, 64409*, 82745*, 84950*, 99230*, E12439*, N23635*, N66406*
 1902 | | | | → R1b1a2a2a CTS1848 [1/3], L584 [9/9], PF3449 [1/3], PF7580 [3/3]
 1903 | | | | ↳ 152974, 166322, 166323, 182984, 235098, 45475, 87265, 92187, N10795, N113044, N93831
 1904 | | | | → R1b1a2a2b L277 [6/6], L479 [1/1] (no nearby negative results)
 1905 | | | | ↳ 159189, 177152, 195191, 234905, 95875, N97723
 1906 | | | | → ? R1b1a2a2c L150/PF6274 bR
 1907 | | | | ↳ 108347, N37658
 1908 | | | | → R1b1a2a2-1[△] CTS7763 [1/1], CTS8966 [1/1]
 1909 | | | | ↳ 164226
 1910 | | | | → R1b1a2a-1-1[△] CTS7822 [7/7]
 1911 | | | | ↳ 247019, N115176, N29277
 1912 | | | | → R1b1a2a-1-1-1 CTS9219 [4/4]
 1913 | | | | ↳ 257843, N112689, N114393, N115142
 1914 | | | | → R1b1a2a-2 PF7558 [5/5], PF7562 [5/5], PF7563 [5/5]
 1915 | | | | → 126775 (Unexpected negative calls: L23- [1 level above, at R1b1a2a], L49- [1 level above, at R1b1a2a].), 282121, N114224, N92413
 1916 | | | | → R1b1a2a-2-1 CTS1411^R [1/1]
 1917 | | | | ↳ N57861
 1918 | | | | → ? R1b1a2a-3 L216 [1/1]
 1919 | | | | ↳ 149197
 1920 | | | | → R1b1-1-1 PF4354 [1/1]
 1921 | | | | ↳ N114281
 1922 | | | | → R1b1-1-2 CTS1647 [1/1], CTS5330 [1/1], CTS6189 [1/1], CTS7124 [1/1]
 1923 | | | | ↳ N26020
 1924 | | | | → R1b1-2 F2482 [1/1], F3599^R [1/1], Z486^R [1/1]
 1925 | | | | ↳ 267597

R1b-U106

Continued from above (line 1850 on page 36)

1926 R1b1a2a1a1 M405/S21/U106 [794/823]
 1927 → 220 non-Geno kits requiring further testing; 121519, 181203, 246919, 275916, 284914, N103013, N52462, N59802, N82860
 1928 → R1b1a2a1a1a⁸⁴ L217/S1849 [2/6], Z290^R [4/5]
 1929 → 23545, 23884*, B2976
 1930 → R1b1a2a1a1a-1⁸⁵ Z253/S218^R [1/1]
 1931 | → R1b1a2a1a1a-1-1 PF1557^R [1/1]
 1932 | ↳ N112401
 1933 | → ? R1b1a2a1a1a-2 DF23/S193^R [1/1]

⁸¹ L1068 also found in nearby clade R1b1a2a1a2c1-3 (line 2531 on page 46). One set of instances may be erroneous. Further investigation required.

⁸² PF4874 also found in nearby clade R1b1a2a1a2b1-2 (line 2278 on page 42). One set of instances may be erroneous. Further investigation required.

⁸³ L618 and Z1146 also found in nearby clade R1b1a2a1a1b1-1 (line 1959 on page 38). F3436 also found in nearby clade R1b1a2a1a2a2-1 (line 2192 on page 41). One set of instances may be erroneous. Further investigation required.

⁸⁴ Z290 also found in nearby clade R1b1a2a1a2c (line 2322 on page 43). One set of instances may be erroneous. Further investigation required.

⁸⁵ Z253 also found in nearby clade R1b1a2a1a2c1f (line 2400 on page 44). One set of instances may be erroneous. Further investigation required.

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1934   ↳ 107869*
1935   → R1b1a2a1a1a-386 Z255/S219R [1/1]
1936   ↳ N4697
1937   → R1b1a2a1a1a-487 M529/L21/S145R [1/1]
1938   ↳ N18643
1939   → R1b1a2a1a1b88 Z18/S493 [49/49], Z19R [11/31] (between R1b1a2a1a1b and R1b1a2a1a1b1: Z16/S261 [26/26])
1940   → 102069*, 13322*, 13875*, 18235*, 47939*, 69650*, 7792*, 90062*, 94743*, N35424*, N68706*
1941   → R1b1a2a1a1b1 Z14 [34/37]
1942   → 130720*, 147657*, 187926*, 79346*, E2267*, N113223*, N114368*, N114384*, N115161*, N17100*, N31052*, N44777*, N61825
1943   → R1b1a2a1a1b1a Z372/S375 [11/13] (Cannot resolve: Z15 [2/7] (no nearby negative results))
1944   → 101644*, 122883, 174347, 93598*, E1923*, N113653, N12646*
1945   → R1b1a2a1a1b1a1 L257/S186 [13/13]
1946   → 150571*, 171373*, 37089*, 37126*, 50943*, 55308*, 60941*, 64800*, 70549*, 72658*, 90398*, N113458
1947   → R1b1a2a1a1b1a1-1 CTS11525R [1/1]
1948   ↳ B3023
1949   → R1b1a2a1a1b1a1-1 CTS10855R [1/1]
1950   → 50394
1951   → R1b1a2a1a1b1a-289 Z19R [10/10]
1952   → 243831*, 65496* (Unexpected negative call: Z14- [2 levels above, at R1b1a2a1a1b1].), 68399* (Unexpected negative call: Z14- [2 levels above, at R1b1a2a1a1b1].), N14340, N37019, N65375 (Unexpected negative call: Z372- [1 level above, at R1b1a2a1a1b1a].), N78258*
1953   → R1b1a2a1a1b1a-2-1 L147R [1/1]
1954   ↳ N85364 (Unexpected negative call: Z372- [2 levels above, at R1b1a2a1a1b1a].)
1955   → R1b1a2a1a1b1a-2-2△ F2415 [1/1]
1956   ↳ N85247
1957   ?→ R1b1a2a1a1b1a-2-3△ L325 [1/1]
1958   ↳ E7307 (Unexpected negative call: Z14- [3 levels above, at R1b1a2a1a1b1].)
1959   → R1b1a2a1a1b1-1△90 L618R [1/1], Z454R [1/1], Z1146/L797/PF2016R [1/1]
1960   ↳ N114052
1961   → R1b1a2a1a1b1-2△91 F2125R [1/1]
1962   ↳ N114742
1963   → R1b1a2a1a1b1-3△ CTS904 [1/1], PF257R [1/1]
1964   ↳ N83001
1965   → R1b1a2a1a1b1-4△ CTS2158 [1/1]
1966   ↳ N14534
1967   ?→ R1b1a2a1a1b1-5 L343R [1/1]
1968   ↳ 17432
1969   → R1b1a2a1a1c Z381/S263 [234/234]
1970   → 246302, 251733, 275871, N112664, N113790
1971   → R1b1a2a1a1c1 Z156/S264 [80/80]
1972   → 104866, 111203, 117323*, 137970*, 147853*, 215023*, 33309*, 35043*, 57352*, 57431*, 65132, 80961*, 90791, 93223*, B3197, E2091*, N10078 (Unexpected negative call: L132- [18 levels above, at F].), N10310*, N114168
1973   → R1b1a2a1a1c1a Z305/S376 [24/25], Z306 [54/54], Z307 [50/51] (Cannot resolve: Z304 [4/4] (no nearby negative results))
1974   → 120386*, 175525
1975   → R1b1a2a1a1c1a-1 F2735R [1/1]
1976   ↳ N6918
1977   → R1b1a2a1a1c1a-2 DF96 [3/3] (between R1b1a2a1a1c1a and R1b1a2a1a1c1a2)
1978   → 16 non-Geno kits requiring further testing: 12190*, 179381*, 197037*, 202349*, 222086*, 239336*, 263108*, 284744*, 5010*, 75848*, 75884*, E2541*, H1112*, N112415*, N112502*, N112756*, N112808*, N112833*, N113250*, N113640*, N114348*, N114884*, N115206*, N115247*, N17289*, N35071*, N46336*, N74756*, N80765*, N90804*
1979   → R1b1a2a1a1c1a1 L1/DYS439-NULL/S26 [17/17]
1980   ↳ 1224, 128017, 14179 (Unexpected negative call: L132- [21 levels above, at F].), 160058, 176669 (Unexpected negative call: L132- [21 levels above, at F].), 34685 (Unexpected negative call: L132- [21 levels above, at F].), 55041, 57020, 57059 (Unexpected negative call: L132- [21 levels above, at F].), 65834 (Unexpected negative call: L132- [21 levels above, at F].), 88125, 91619, 91989, N12019, N15675, N17557, N5525
1981   → R1b1a2a1a1c1a2 P89R [1/1], PF4142 [1/1]
1982   ↳ 1196 (Duplicate call: P89 [at this level].)
1983   → R1b1a2a1a1c1a3 L128 [2/2]
1984   ↳ 148146
1985   → R1b1a2a1a1c1a3-1 L127R [1/1]
1986   ↳ 5962 (Duplicate call: L127 [at this level].)
1987   → R1b1a2a1a1c1a-2△ Z243 [1/1]
1988   ↳ 178396
1989   → R1b1a2a1a1c1a-2△ CTS7550R [1/1]
1990   ↳ B2570
1991   → R1b1a2a1a1c1a-2-3△ F1559R [1/1]
1992   ↳ 265623
1993   → R1b1a2a1a1c1-1 CTS11337 [2/2]
1994   ↳ 252157
1995   → R1b1a2a1a1c1-1-1 L247R [1/1]
1996   ↳ N115135
1997   → R1b1a2a1a1c1-2 F3024 [1/1]
1998   ↳ 176334
1999   → R1b1a2a1a1c1-3 F1668R [1/1]
2000   ↳ 230038
2001   → R1b1a2a1a1c1-4 PF3988R [1/1]
2002   ↳ 83604
2003   → R1b1a2a1a1c2 Z301 [13/154] (Cannot resolve: Z301 [13/154])
2004   ↳ 104946, 106361, 42776, 89750, 97148

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⁸⁶ Z255 also found in nearby clade R1b1a2a1a2c1e (line 2392 on page 44). One set of instances may be erroneous. Further investigation required.⁸⁷ M529 also found in nearby clade R1b1a2a1a2c (line 2322 on page 43). One set of instances may be erroneous. Further investigation required.⁸⁸ Z19 also found in nearby clade R1b1a2a1a1b1a-2 (line 1951 on this page). One set of instances may be erroneous. Further investigation required.⁸⁹ Z19 also found in nearby clade R1b1a2a1a1b (line 1939 on this page). One set of instances may be erroneous. Further investigation required.⁹⁰ L618 and Z1146 also found in nearby clade R1b1a2a1a-5 (line 1890 on page 37). One set of instances may be erroneous. Further investigation required.⁹¹ F2125 also found in nearby clade R1b1a2a1a2a2-1 (line 2192 on page 41). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.⁹² L46 also found in nearby clade R1b1a2a1a1c2b1a1a-1 (line 2017 on this page). One set of instances may be erroneous. Further investigation required.

These kits have one or more positive SNPs known or proposed to be at the R1b1a2a1a1c2b1a1a-1 level (line 2017 on this page): 108880 (1), 115986 (1), 122771 (1), 154926 (1), 40224 (1) and N20541 (1). Further investigation is required.

⁹³ These kits have one or more SNPs proposed to be at the R1b1a2a1a1c2b1a1a-1 level (line 2017 on this page), but they all lack positive calls for any ISOOGG-recognised SNPs at this level: 131142 (1), 160420 (1), 52338 (1), 68995 (1) and 6997 (1).⁹⁴ L46 also found in nearby clade R1b1a2a1a1c2b1a1 (line 2013 on this page). One set of instances may be erroneous. Further investigation required.⁹⁵ Z332 also found in nearby clade R1b1a2a1a1c2b2b1a-1 (line 2047 on this page). One set of instances may be erroneous. Further investigation required.⁹⁶ Z332 also found in nearby clade R1b1a2a1a1c2b2b1a1-1 (line 2037 on this page). One set of instances may be erroneous. Further investigation required.

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R1b-DF27

Continued from above (line 1853 on page 36)

2113 R1b1a2a1a2a DF27/S250 [106/107]
2114 → 60 non-Geno kits requiring further testing; 149550*, 163032*, 174606*, 214921*, 232302*, 234361, 252516*, 39078, 56085*, E14895*, N104559*, N107249*, N112478*, N113444*, N34129, N77159*
2115 → R1b1a2a1a2a1 Z195/S227 [67/67], Z196/S355 [69/69]
2116 → 115040*, 155630*, 159531*, 171444*, 24058*, N44347*, N67378*
2117 → R1b1a2a1a2a1b L176/S179 [45/45]
2118 → 104828*, 10487*, 107408*, 108105*, 158502*, 231541*, 35217*, 58265*, 93234*
2119 → R1b1a2a1a2a1b1 Z262 [4/22]
2120 → 174435, 253563, 44638
2121 → R1b1a2a1a2a1b1a⁹⁷ M167/SRY2627 [115/115] (between R1b1a2a1a2a1b1a and R1b1a2a1a2a1b1a-1-1: CTS4716 [18/18], Z199/S234 [18/18], Z200/S361 [18/18], Z204 [18/18])
2122 → R1b1a2a1a2a1b1a-1 Z203 [18/18], Z264 [18/18], Z266 [18/18]
2123 → R1b1a2a1a2a1b1a-1-1 Z202 [17/18]
2124 → N114528, N74352
2125 → R1b1a2a1a2a1b1a-1-1-1 Z205 [15/15]
2126 → N114430, N115641
2127 → R1b1a2a1a2a1b1a-1-1-1-1 CTS8289 [11/11]
2128 → N14866
2129 → R1b1a2a1a2a1b1a-1-1-1-1-1 Z207/S251 [12/12]
2130 → 44804*, 5185
2131 → R1b1a2a1a2a1b1a-1-1-1-1-1 CTS4299 [10/10]
2132 → 23253*, 269922, 62986*, 97633, N112355, N112764, N113329, N113694, N114692
2133 → R1b1a2a1a2a1b1a-1-1-1-1-1-1 PF3634^R [1/1]
2134 → N38675
2135 → R1b1a2a1a2a1b1a-1-1-1-1-2 PF742^R [1/1]
2136 → 154890
2137 → R1b1a2a1a2a1b1a-1-1-1-2 CTS606 [2/2]
2138 → N114875, N30601
2139 → R1b1a2a1a2a1b1a-1-1-2 CTS3221^R [1/1], PF6894^R [1/1]
2140 → N113296
2141 → R1b1a2a1a2a1b1a-2 L628 [1/1]
2142 → N42387
2143 → R1b1a2a1a2a1b-1 Z198 [25/25]
2144 → 113391, 167763*, 209708*, 284636, 41647*, 86995*, N112351, N114597, N115425, N3980*, N75535
2145 → R1b1a2a1a2a1b2 L165/S68 [14/14]
2146 → 165113, 170048, 27859, 3134, 40331, 40551, 46281, 47096, 50928, 64253, 65411, 66014, 99027, N115386
2147 → R1b1a2a1a2a1b3 CTS4188 [6/6]
2148 → 174609, 50004*, N112845

⁹⁷ Z201 results have been discarded. This marker seems to be prone to back-mutations.

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2149 | | | | → R1b1a2a1a2a1b3-1 Z1146/L797/PF2016^R [2/2]
2150 | | | | → R1b1a2a1a2a1b3-1-1 F672^R [1/1]
2151 | | | | ↓ N114201
2152 | | | | → R1b1a2a1a2a1b3-1-2 F756 [1/1], PF1285^R [1/1], PF1359/V89 [1/1], PF3346^R [1/1]
2153 | | | | ↓ N114116
2154 | | | | → R1b1a2a1a2a1b3-2 L88^R [1/1], L421^R [1/1], L433^R [1/1]
2155 | | | | ↓ N113440
2156 | | | | → R1b1a2a1a2a1b-1-1[△] CTS7095^R [1/1], CTS10855^R [1/1]
2157 | | | | ↓ 238203 (Duplicate call: L176 [2 levels above, at R1b1a2a1a2a1b]. Presumed L176+.)
2158 | | | | → R1b1a2a1a2a1b-1-2[△] CTS7079 [1/1], CTS10320 [1/1], PF7510 [1/1]
2159 | | | | ↓ N112596
2160 | | | | ? R1b1a2a1a2a1b-1-3 L147^R [1/1]
2161 | | | | ↓ 171839
2162 | | | | → R1b1a2a1a2a1b-1-4[△] PF4161 [1/1]
2163 | | | | ↓ 272083
2164 | | | | → R1b1a2a1a2a1-1[△] Z274/S229 [30/30]
2165 | | | | ↓ R1b1a2a1a2a1a Z209/S230 [36/36], Z210 [25/25], Z215 [25/25], Z220/S356 [73/73], Z268/S450 [30/30]
2166 | | | | → 35 non-Geno kits requiring further testing; 211471, 23193, 266575, 272381, 289975, N112702, N113462, N115358, N2640
2167 | | | | → R1b1a2a1a2a1a-1 Z295 [16/16]
2168 | | | | → R1b1a2a1a2a1a-1-1 Z270 [10/10]
2169 | | | | ↓ 262674
2170 | | | | → R1b1a2a1a2a1a1 CTS12074 [8/8], Z211/S358 [8/8], Z212 [8/8], Z216 [10/16], Z273^R [8/8], Z278/S181 [22/22]
2171 | | | | ↓ 104747*, 135403*, 157033, 189915, 201229, 27539, 28321 (Duplicate call: L176+.) 289627, 29360, 78029*, 83343, N113324, N58888, N94262
2172 | | | | → R1b1a2a1a2a1a1a Z214/S348 [10/10] (between R1b1a2a1a2a1a1a and R1b1a2a1a2a1a1a-1: Z299 [4/4])
2173 | | | | ↓ 115590*, B1595*, B3990, N103224*, N27160*, N34178*
2174 | | | | → R1b1a2a1a2a1a1a-1 Z279 [3/3]
2175 | | | | ↓ N50965
2176 | | | | → R1b1a2a1a2a1a1a1 M153 [8/8]
2177 | | | | ↓ 159918, 71688, 74765, 76019, 85359, E8053, N113609, N66037
2178 | | | | → R1b1a2a1a2a1a1a1-1 L160/PF4013^R [1/1], U175^R [1/1], Z6/S276^R [1/1]
2179 | | | | ↓ N8661
2180 | | | | → R1b1a2a1a2a1a1a1-1-1 PF5535^R [1/1]
2181 | | | | ↓ N115536
2182 | | | | → R1b1a2a1a2a1a-2 CTS4065 [6/6]
2183 | | | | ↓ 109279 (Confirmed CTS4065+. Presumed Z295+.) 144165, 208146, N112585, N115807
2184 | | | | → R1b1a2a1a2a1a-1-2-1 L484 [5/5]
2185 | | | | ↓ 195834, 217955, 44479, E11737, N58749
2186 | | | | → R1b1a2a1a2a1a-2⁹⁸ CTS11067 [1/1], L617^R [1/1], PAGES00022^R [1/1], PF3236 [1/1], PF3303^R [1/1]
2187 | | | | ↓ N115093
2188 | | | | → R1b1a2a1a2a1c CTS7768 [8/8], DF17/S455 [7/7]
2189 | | | | ↓ 104956, 1188, 221732, 26772, 287394, 89885, B2669, N115270, N1993, N30509, N3432
2190 | | | | → R1b1a2a1a2a2⁹⁹ L617^R [2/2]
2191 | | | | ↓ 5928 (Duplicate call: Z274. Presumed PF3236-, Z210-, Z215-, Z220- and Z274-.)
2192 | | | | → R1b1a2a1a2a2-1¹⁰⁰ CTS11556^R [1/1], F2125^R [1/1], F3436^R [1/1], Z24^R [1/1]
2193 | | | | ↓ N113736 (Unexpected negative call: DF27- [2 levels above, at R1b1a2a1a2a].)
2194 | | | | → R1b1a2a1a2a3 L881 [2/2]
2195 | | | | ↓ 101901, 26020
2196 | | | | → R1b1a2a1a2a-1¹⁰¹ F3867^R [1/1]
2197 | | | | ↓ 110924
2198 | | | | → R1b1a2a1a2a-2 CTS11567 [3/3]
2199 | | | | ↓ 222323, 29108, 46496 (Unexpected negative call: L69- [17 levels above, at IJK].)
2200 | | | | → R1b1a2a1a2a-3[△] CTS9952 [1/1]
2201 | | | | ↓ 227823
2202 | | | | → R1b1a2a1a2a-4[△] L194 [1/1]
2203 | | | | ↓ N2642
2204 | | | | → R1b1a2a1a2a-5[△] L86^R [1/1]
2205 | | | | ↓ 172132 (Duplicate call: L86 [at this level].)
2206 | | | | → R1b1a2a1a2a-6[△] DF83 [2/2]
2207 | | | | ↓ 235308, 4354 (Duplicate call: DF27 [1 level above, at R1b1a2a1a2a]. Presumed DF27+.)
2208 | | | | ? R1b1a2a1a2a-7[△] DF81 [2/2]
2209 | | | | ↓ 16848, E9720
2210 | | | | ? R1b1a2a1a2a-8[△] L1245 [1/1], L1246 [1/1]
2211 | | | | ↓ 125381

R1b-U152

Continued from above (line 1854 on page 36)

2212 R1b1a2a1a2b¹⁰² U152/PF6570/S28 [442/442] (Cannot resolve: L2/S139 [274/426])
2213 | | | | → 79 non-Geno kits requiring further testing; 10814, 130149, 216196, 223929, 255498, 285324, 47686, B1735, N111980, N112368, N113476, N115341, N2620, N42592, N50337
2214 | | | | → R1b1a2a1a2b1 L2/S139 [274/276]
2215 | | | | → 109 non-Geno kits requiring further testing; 125963, 141262, 225559, 233653, 235978, 24268, 284610, 65648, 89034, B1238, B4978, N101983, N113228, N113294, N113299, N114139, N114704, N114738, N115300, N115359, N115394, N115612, N4150, N60267, N90341 (Unexpected negative call: L69- [17 levels above, at IJK].)
2216 | | | | → R1b1a2a1a2b1a Z367/S255 [39/40]

⁹⁸ L617 also found in nearby clade R1b1a2a1a2a2 (line 2190 on this page). One set of instances may be erroneous. Further investigation required.

⁹⁹ L617 also found in nearby clade R1b1a2a1a2a1a-2 (line 2186 on this page). L617 also found in nearby clade R1b1a2a1a2b1-3 (line 2280 on page 42). One set of instances may be erroneous. Further investigation required.

¹⁰⁰ F3436 also found in nearby clade R1b1a2a1a-5 (line 1890 on page 37). F2125 also found in nearby clade R1b1a2a1a1b1-2 (line 1961 on page 38). One set of instances may be erroneous. Further investigation required.

¹⁰¹ F3867 also found in nearby clade R1b1a2a1a2b1c-2 (line 2272 on page 42). One set of instances may be erroneous. Further investigation required.

¹⁰² These kits have one or more positive SNPs known or proposed to be at the R1b1a2a1a2b3b level (line 2304 on page 43): B1735 (2) and N111980 (2). Further investigation is required.

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2217 → N72390*

2218 → R1b1a2a1a2b1a1 L20/S144 [68/68], Z383^R [21/21], Z384/S492 [15/15]

2219 → 52 non-Geno kits requiring further testing; 158733 (Unexpected negative call: L2- [2 levels above, at R1b1a2a1a2b1].), 183312, 223650, N113048, N113862, N114019, N114697, N115145, N72607

2220 → R1b1a2a1a2b1a1-1 PF3346^R [1/1], Z454^R [1/1], Z1146/L797/PF2016^R [1/1]

2221 ↘ 130274

2222 → R1b1a2a1a2b1a1-2 CTS7275 [1/1], L98 [1/1], L303 [1/1], L763 [1/1], PF121 [1/1], YSC0000081 [1/1], YSC0001270/CTS358 [1/1], YSC0001289/CTS8127 [1/1]

2223 ↘ 217453

2224 → R1b1a2a1a2b1a1-3 M228 [1/1]

2225 ↘ N9198 (Duplicate call: M228 [at this level].)

2226 → R1b1a2a1a2b1a1-4 CTS11795^R [1/1]

2227 ↘ 1336

2228 → R1b1a2a1a2b1a1-5 F1948 [1/1]

2229 ↘ N78666

2230 ?→ R1b1a2a1a2b1a1-6¹⁰³ Z258^R [1/1]

2231 ↘ 155835

2232 ?→ R1b1a2a1a2b1a1-7 Z291 [1/1]

2233 ↘ 167970

2234 → R1b1a2a1a2b1a2 Z34/S368 [11/11]

2235 → 11208*, N51030

2236 → R1b1a2a1a2b1a2a Z35 [21/22]

2237 → R1b1a2a1a2b1a2a-1¹⁰⁴ CTS9044 [2/2], Z259 [2/2], Z276^R [3/3]

2238 → 8343*(Unexpected negative call: Z35- [1 level above, at R1b1a2a1a2b1a2a].)

2239 → R1b1a2a1a2b1a2a-1-1¹⁰⁵ L1293 [1/1], Z258^R [1/1]

2240 ↘ 36943

2241 → R1b1a2a1a2b1a2a-1-2 CTS8479^R [1/1]

2242 ↘ H1141

2243 → R1b1a2a1a2b1a2a-2

2244 → 145336*, 162061*, 182569*, 187214*, 19049*, 223432*, 36219*, 46867*, 61922*, 6953*, 85332*, N106789*, N16080*, N26047*, N28931*

2245 ?→ R1b1a2a1a2b1a2a1 Z275 [3/3]

2246 → 25285*, N50869*

2247 → R1b1a2a1a2b1a2a1-1¹⁰⁶ Z276^R [1/1]

2248 ↘ 187876

2249 → R1b1a2a1a2b1a2a-2-1△ F3483 [1/1], PF735 [1/1], PF2111^R [1/1], PF2331^R [1/1], PF3068^R [1/1], PF5589^R [1/1], PF5821^R [1/1], PF7445^R [1/1], Z273^R [1/1], Z465^R [1/1], Z1856^R [1/1]

2250 ↘ N81364

2251 → R1b1a2a1a2b1b L196 [3/3]

2252 ↘ 19736 (Unexpected negative call: L69- [18 levels above, at IJK].), 203938, N52049

2253 → R1b1a2a1a2b1c Z49 [45/45]

2254 → 121740*, 14125*, 156106*, 223609, 240232, 258131, 264772, 43837, 64890*, B3175, N112541, N113031, N113655, N40919*, N55642, N71871*, N81973*, N8637*

2255 → R1b1a2a1a2b1c1 Z142/S211 [18/23] (Cannot resolve: Z142/S211 [18/23])

2256 → 125781, 134736, 1370, 142637*, 145421, 172561*, 184173*, 203575*, 209585*, 249822*, 31971, 6342*, 8642*, E5562*

2257 → R1b1a2a1a2b1c1a L562 [9/9], Z51/S369 [5/5]

2258 → 101133*, 224076*, 233271*, 73381*, N114339

2259 → R1b1a2a1a2b1c1a-1 Z57 [3/3]

2260 → 206005, B3637

2261 → R1b1a2a1a2b1c1a-1-1 Z65 [1/1], Z149 [1/1]

2262 ↘ N113858

2263 → R1b1a2a1a2b1c1a-2 L3/S216 [1/1]

2264 ↘ N1950 (Unexpected negative call: L69- [21 levels above, at IJK].)

2265 → R1b1a2a1a2b1c1-1 L553 [1/1], Z150/S257 [2/2]

2266 → 31300

2267 → R1b1a2a1a2b1c1-1-1¹⁰⁷ CTS7970^R [1/1]

2268 ↘ N28922

2269 → R1b1a2a1a2b1c-1¹⁰⁸ CTS7970^R [1/1]

2270 → R1b1a2a1a2b1c-1-1 CTS8125 [1/1], CTS11381 [1/1]

2271 ↘ 111766

2272 → R1b1a2a1a2b1c-2¹⁰⁹ F3867^R [1/1]

2273 ↘ B2635

2274 → R1b1a2a1a2b1c-3¹¹⁰ P37^R [1/1]

2275 ↘ N112803

2276 → R1b1a2a1a2b1-1△ F4010^R [1/1]

2277 ↘ N37886

2278 → R1b1a2a1a2b1-2¹¹¹ PF4874^R [1/1], PF4955^R [1/1]

2279 ↘ 4818 (Unexpected negative call: L69- [18 levels above, at IJK].)

2280 → R1b1a2a1a2b1-3¹¹² F1237^R [1/1], L617^R [1/1], P329^R [1/1]

2281 ↘ 72457

2282 → R1b1a2a1a2b1-4△ CTS5153^R [1/1]

2283 ↘ N113573

2284 ?→ R1b1a2a1a2b1-5 L408 [1/1], L409 [1/1], L443 [1/1]

2285 ↘ 55257

2286 → R1b1a2a1a2b2 Z36/S206 [41/41]

¹⁰³ Z258 also found in nearby clade R1b1a2a1a2b1a2a-1 (line 2239 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁴ Z276 also found in nearby clade R1b1a2a1a2b1a2a1-1 (line 2247 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁵ Z258 also found in nearby clade R1b1a2a1a2b1a6 (line 2230 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁶ Z276 also found in nearby clade R1b1a2a1a2b1a2a-1 (line 2237 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁷ CTS7970 also found in nearby clade R1b1a2a1a2b1c-1 (line 2269 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁸ CTS7970 also found in nearby clade R1b1a2a1a2b1c1-1 (line 2267 on this page). One set of instances may be erroneous. Further investigation required.¹⁰⁹ F3867 also found in nearby clade R1b1a2a1a2a-1 (line 2196 on page 41). One set of instances may be erroneous. Further investigation required.¹¹⁰ P37 also found in nearby clade R1b1a2a1a2c-5 (line 2555 on page 46). One set of instances may be erroneous. Further investigation required.¹¹¹ PF4874 also found in nearby clade R1b1a2a1a2-2 (line 1872 on page 37). One set of instances may be erroneous. Further investigation required.¹¹² L617 also found in nearby clade R1b1a2a1a2a2 (line 2190 on page 41). One set of instances may be erroneous. Further investigation required.

2287 → 10435*, 128037, 149233*, 150506*, 154877*, 166207*, 181748, 188413*, 199556, 199850*, 206788*, 211272*, 22799, 258314, 293548, 31552*, 42313*, 42389*, 45294*, 50997*, 51926*, 5825*, 85015*, E14528, E5182, N15426*, N21533*, N25073*, N25265*, N26266*, N52629*, N62602*, N64186*, N69385*, N9474*

2288 → R1b1a2a1a2b2-1 L671 [1/1]
↳ 152053

2289 → R1b1a2a1a2b2-2 CTS188 [1/1], CTS4333 [1/1], CTS7958 [1/1]
↳ E10249

2290 → R1b1a2a1a2b2-3 CTS7618 [1/1]
↳ N115303

2291 → R1b1a2a1a2b2-4 CTS1595 [1/1], CTS5531 [1/1], CTS8492 [1/1], Z37 [1/1], Z54 [1/1], Z143 [1/1]
↳ 231111

2292 → R1b1a2a1a2b2-5¹¹³ CTS2687^R [1/1]
↳ N113705

2293 → R1b1a2a1a2b2-6 L198^R [1/1]
↳ N63749

2294 → R1b1a2a1a2b3 Z56/PF6601 [29/32] (Cannot resolve: Z56/PF6601 [29/32])
→ 131695*, 135505*, 150989*, 157027*, 168076*, 177427*, 18393*, 207384*, 21470, 34105, 42240, 48063*, 72611, 75501*, 83685, 94623*, N41275*, N47976*

2295 → R1b1a2a1a2b3a L4/S178 [3/3]
↳ 155510, 338, N26704

2296 → R1b1a2a1a2b3b¹¹⁴ S47 [8/8] (between R1b1a2a1a2b3b and R1b1a2a1a2b3b-1: Z46/S259 [3/3], Z47 [3/3], Z48/S484 [3/3])
→ 174691*, 245795, 53139, E9334, N14983, N23700, N84624

2297 → R1b1a2a1a2b3b-1 L100 [1/1]
↳ 26288

2298 → R1b1a2a1a2b3c Z144 [8/8], Z145/PF6578 [11/11], Z146/PF6584/S483 [11/11] (between R1b1a2a1a2b3c and R1b1a2a1a2b3c-1: Z71 [3/3])
→ 100141*, 113856, 148025*, 37107*, 39222, 40886*, 88899*, E8003*, N103425, N113439

2299 → R1b1a2a1a2b3c-1¹¹⁵ S47 [1/1]
↳ 35655

2300 → R1b1a2a1a2b-1 F1493^R [1/1]
↳ 231195

2301 → R1b1a2a1a2b-2 CTS7193^R [2/2]
↳ 40733, N4715

2302 → R1b1a2a1a2b-3 CTS1821^R [1/1]
↳ N114613

2303 → R1b1a2a1a2b-4 PF4363^R [3/3]
↳ 24162, 28112, B1388

2304 → R1b1a2a1a2b-5 CTS11874 [2/2], PF6652 [2/2], Z192 [2/2], Z194 [2/2]
↳ 180858, N8217

R1b-L21

Continued from above (line 1855 on page 36)

2305 → R1b1a2a1a2c¹¹⁶ L459 [67/68], M529/L21/S145^R [1162/1183], Z290^R [350/357] (Cannot resolve: L346 [2/3] (between R1b1a2a1a2c1 and R1b1a2a1a2c1-5), L356 [2/3] (between R1b1a2a1a2c1 and R1b1a2a1a2c1-5), L564 [3/16] (between R1b1a2a1a2c and R1b1a2a1a2c1-5), Z245 [42/42], Z260 [6/6] (no nearby negative results))
→ 285 non-Geno kits requiring further testing; N103263*, N36461*, N60727*, N80403

2306 → R1b1a2a1a2c1 DF13/CTS241/S521 [379/379] (Cannot resolve: Z260 [4/4] (no nearby negative results), Z2542/CTS8221 [24/24])
→ 104 non-Geno kits requiring further testing; 11143*, 113031*, 116159*, 14197*, 145001*, 171804*, 185703*, 188325*, 188927*, 20180*, 206354*, 224813*, 235406*, 26082*, 270983*, 39420*, 74820*, 79421*, 82258*, B2575*, B3500*, N112654*, N112662*, N113964*, N37694*, N70599*, N98521*

2307 → R1b1a2a1a2c1a DF49/S474 [24/24]
→ 108812*, 117897*, 181809*, 183161*, 192660*, 230120, 230866*, 31795*, 44126*, 47105*, 59601*(Unexpected negative call: L69- [18 levels above, at IJK].), 86522*

2308 → R1b1a2a1a2c1a1 DF23/S193^R [116/117]
→ 119874, 137235, 177202, 18917*, 19920, 39249*, 41836*, 5155*, 63595, 78065*, 79710, 97610, N103463*, N105597*, N10959*, N113168*, N115349*, N115560*, N1871*, N8220*, N92711*

2309 → R1b1a2a1a2c1a1a Z2961 [11/11]
→ 101343, 159039, 259442*, 73834, N108400, N26284

2310 → R1b1a2a1a2c1a1a1 M222/PAGE84/USP9Y+3636 [356/357], Z2955 [6/6], Z2962 [5/5], Z2963 [4/4], Z2964 [5/5], Z2970 [4/4], Z2972 [5/5], Z2973 [4/4], Z2988 [5/5]
→ 275 non-Geno kits requiring further testing; 118913, 145320, 164044, 165907, 17624, 192014, 193494, 196682, 197231, 199859, 2008, 201623, 205699, 215509, 220455, 229234, 229652, 230303, 231979, 246349, 251441, 262388, 263423, 266313, 270957, 274329, 29142, 30771, 47582, 7874, 80603, 82395, 87711, 88905, 8999, B3060, N103465, N104491, N112356, N112471, N112505, N112691, N112723, N113724, N113738, N113849, N113900, N114352, N114534, N114662, N114747, N114844, N115028, N115191, N18064, N2231, N23504, N26529, N4029, N54683, N55831, N5845, N58492, N64222, N7406, N77616, N86819

2311 → R1b1a2a1a2c1a1a1-1 F3952^R [1/1]
→ N10119

2312 → R1b1a2a1a2c1a1a1-2 PF2028^R [2/2]
→ 73633, N112614

2313 → R1b1a2a1a2c1a1a1-3 CTS655 [1/1], CTS11991^R [1/1] (no nearby negative results), L753 [1/1], PF90 [1/1] (no nearby negative results), PF5848 [1/1] (no nearby negative results), PF5856 [1/1] (no nearby negative results), PF5985 [1/1] (no nearby negative results), PF6009^R [1/1] (no nearby negative results), PF6248 [1/1] (no nearby negative results), PF6407 [1/1] (no nearby negative results), PF6413 [1/1] (no nearby negative results), PF6414 [1/1] (no nearby negative results), PF6417 [1/1] (no nearby negative results), PF6428 [1/1] (no nearby negative results), PF6442 [1/1] (no nearby negative results), PF6459 [1/1] (no nearby negative results), PF6525 [1/1] (no nearby negative results), YSC0000083 [1/1], YSC0000167 [1/1] (no nearby negative results), Z2977 [1/1] (no nearby negative results), Z2984 [1/1] (no nearby negative results)
→ 181933

2314 → R1b1a2a1a2c1a1a1-4 PF1169^R [5/5]
→ 16646, 227877, 269091, N115312, N58591

2315 → R1b1a2a1a2c1a1a1-5 F1265 [3/3]
→ 227811, 272418, 39277

2316 → R1b1a2a1a2c1a1a1-6 PF2155/CTS8002^R [1/1]

¹¹³ CTS2687 also found in nearby clade R1b1a2a1a2c1b-3 (line 2372 on page 44). One set of instances may be erroneous. Further investigation required.

¹¹⁴ S47 also found in nearby clade R1b1a2a1a2b3c-1 (line 2310 on this page). One set of instances may be erroneous. Further investigation required.

¹¹⁵ S47 also found in nearby clade R1b1a2a1a2b3b (line 2304 on this page). One set of instances may be erroneous. Further investigation required.

¹¹⁶ Z290 also found in nearby clade R1b1a2a1a1a (line 1928 on page 37). M529 also found in nearby clade R1b1a2a1a1a-4 (line 1937 on page 38). One set of instances may be erroneous. Further investigation required.

Results for David F Reynolds' blacklisted SNPs downstream of R-L21 have been discarded.

Kit 43525 has 1 positive SNP from the R1b1a2a1a2c1-5 level (line 2539 on page 46). Further investigation is required. Kit 89644 has 1 positive SNP from the R1b1a2a1a2c1j1-1 level (line 2491 on page 46). Further investigation is required.

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2345 |   |   ↳ 76350
2346 |   |   → R1b1a2a1a2c1a1a1-7 PF3292R [1/1]
2347 |   |   ↳ 115365
2348 |   |   → R1b1a2a1a2c1a1a1-8 F1400 [1/1]
2349 |   |   ↳ 39109
2350 ?→ R1b1a2a1a2c1a1-1117 L88R [1/1]
2351 |   |   ↳ 129036
2352 ?→ R1b1a2a1a2c1a1-2 L302/S464 [1/1], L319R [1/1]
2353 |   |   ↳ 33932
2354 → R1b1a2a1a2c1b L513/DF1/S215 [95/96], Z249/S279 [37/37]
2355 → 43 non-Geno kits requiring further testing; 151979, 188436, 197401, 210379 (Unexpected negative call: L69- [18 levels above, at IJK].), 215816, 228009 (Unexpected negative call: L69- [18 levels above, at IJK].), 246556, 268319*, 274410*, 290187*, 41466 (Unexpected negative call: L69- [18 levels above, at IJK].), 52669*, 56277, H1601*, N113002*, N113124*, N114028*, N115037*, N1946*, N28178*, N43622*
2356 ?→ R1b1a2a1a2c1b1 P66 [3/3]
2357 |   |   ↳ 184039, 31293, 60586
2358 → R1b1a2a1a2c1b2 L193/S176 [30/30]
2359 |   |   ↳ 130361, 144090, 159822, 167431, 168189, 168205, 175327, 177505, 177897, 179378, 190210, 211338, 213029, 29753, 37870, 38271, 39200, 44265, 46029, 46951, 47786, 55229, 65397, 83065, 90340, 9139, 98112, N19218, N49123, N9932
2360 ?→ R1b1a2a1a2c1b3 L706 [2/2]
2361 |   |   ↳ 219571 (Unexpected negative call: L69- [19 levels above, at IJK].)
2362 |   |   ↳ R1b1a2a1a2c1b3a L705 [7/7]
2363 |   |   ↳ 193851 (Duplicate call: L705 [at this level].), 202969 (Duplicate call: L705 [at this level].), 35532 (Duplicate call: L705 [at this level].), 35601 (Duplicate call: L705 [at this level].), 82655 (Duplicate call: L705 [at this level].), N29541 (Duplicate call: L705 [at this level].), N54638 (Duplicate call: L705 [at this level].)
2364 → R1b1a2a1a2c1b4 CTS3087 [7/7]
2365 |   |   ↳ 131998, 234631, 235940, 4479 (Unexpected negative call: L69- [19 levels above, at IJK].), N112468, N114377, N83227
2366 → R1b1a2a1a2c1b-1 CTS6942 [3/3], CTS11744 [3/3]
2367 |   |   ↳ 58568
2368 |   |   ↳ R1b1a2a1a2c1b-1-1 CTS6621 [2/2]
2369 |   |   ↳ N115079, N84867
2370 → R1b1a2a1a2c1b-2 CTS11795R [1/1]
2371 |   |   ↳ 228772 (Unexpected negative call: L69- [19 levels above, at IJK].)
2372 → R1b1a2a1a2c1b-3118 CTS2687R [1/1]
2373 |   |   ↳ 272519
2374 → R1b1a2a1a2c1b-4△ Z1867R [1/1]
2375 |   |   ↳ N114296
2376 → R1b1a2a1a2c1b-5△ P53R [1/1]
2377 |   |   ↳ N112802
2378 → R1b1a2a1a2c1b-6△ L387 [1/1]
2379 |   |   ↳ N88177
2380 → R1b1a2a1a2c1b-7△ F3817R [1/1]
2381 |   |   ↳ N115945
2382 ?→ R1b1a2a1a2c1b-8△ L577 [1/1]
2383 |   |   ↳ 27274
2384 → R1b1a2a1a2c1c L96 [3/3]
2385 |   |   ↳ 73550, 94156*
2386 → R1b1a2a1a2c1c-1 L168R [1/1]
2387 |   |   ↳ 176268
2388 → R1b1a2a1a2c1d L144/S175 [7/7], L195/S354 [6/6]
2389 |   |   ↳ 130084, 168985*, 55192, 57993*, 83115*, 98399*
2390 ?→ R1b1a2a1a2c1d-1 CTS1751
2391 |   |   ↳ 55192
2392 → R1b1a2a1a2c1e119 Z255/S219R [25/25]
2393 |   |   ↳ 100136, 12757*, 174037*, 203904*, 49867*, N101540, N113095*
2394 → R1b1a2a1a2c1e1 L159/S169 [47/47]
2395 |   |   ↳ 100265, 106868, 120608, 138281, 14738, 148922, 165114, 166226, 169910, 174285, 175090, 182407, 185218, 206460, 262052, 3032, 3055, 31911, 33100, 35733, 38554, 40730, 44088, 48933, 5074, 55943, 66478, 73565, 77772, 82065, 83239, 84037, 84751, 85858, 88224, 90790, 92117, 92891, 95057, 96196, 97041, N11370, N12360, N17860, N2871, N38274, N47848
2396 → R1b1a2a1a2c1e-1△ F111R [1/1], F1636R [1/1]
2397 |   |   ↳ N114085
2398 → R1b1a2a1a2c1e-2△ F3305 [1/1]
2399 |   |   ↳ 249841
2400 → R1b1a2a1a2c1f120 Z253/S218R [114/114]
2401 → 28 non-Geno kits requiring further testing; 169385, 172277*, 219373*, 266497*, 290162*, N112446, N112497*, N112667*, N112731*, N112887, N114096*, N114178*, N114630*, N114887*, N115835*, N20431*, N53331*, N65344*, N69355*, N76424*, N85391
2402 → R1b1a2a1a2c1f1 L554 [3/3]
2403 |   |   ↳ 21435, 23996 (Unexpected negative call: L69- [19 levels above, at IJK].), 278812
2404 → R1b1a2a1a2c1f2 Z2534 [14/14]
2405 |   |   ↳ 115596*, 146819*, 233265, 35981*, 41327* (Unexpected negative call: L69- [19 levels above, at IJK].), 63623*, 81795, N93033*
2406 → R1b1a2a1a2c1f2a L226/S168 [39/39]
2407 |   |   ↳ 10420, 11144, 122577, 123519, 127414, 130351, 163350, 164407, 174394, 183282, 184259, 190465, 190796, 194697, 25505, 27143, 29530, 48596, 50373, 55369, 56031, 57501, 58280, 58423, 61777, 65404, 69433, 72419, 77349, 82328, 93878, N112917, N114237, N13807, N22536, N25784, N54074, N56434, N60944
2408 ?→ R1b1a2a1a2c1f2b L643 [1/1]
2409 |   |   ↳ N1851
2410 → R1b1a2a1a2c1f2c Z2185 [12/12] (Cannot resolve: Z2183 [8/12] (between R1b1a2a1a2c1f2c and R1b1a2a1a2c1f2c1), Z2184 [8/8])
2411 |   |   ↳ 149025*, 161370*, 162176* (Unexpected negative call: L69- [20 levels above, at IJK].), 199889*, N112169, N16295
2412 |   |   ↳ R1b1a2a1a2c1f2c1 L1066/CTS1202 [30/37]

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¹¹⁷ L88 also found in nearby clade R1b1a2a1a2c1f2c-1 (line 2416 on page 45). One set of instances may be erroneous. Further investigation required.¹¹⁸ CTS2687 also found in nearby clade R1b1a2a1a2b2-5 (line 2296 on page 43). One set of instances may be erroneous. Further investigation required.¹¹⁹ Z255 also found in nearby clade R1b1a2a1a1a-3 (line 1935 on page 38). One set of instances may be erroneous. Further investigation required.¹²⁰ Z253 also found in nearby clade R1b1a2a1a1a-1 (line 1930 on page 37). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MorleyDNA.com> for latest.¹²¹ L88 also found in nearby clade R1b1a2a1a2c1a-1 (line 2350 on page 44). One set of instances may be erroneous. Further investigation required.¹²² Z454 also found in nearby clade R1b1a2a1a2c1l-2 (line 2517 on page 46). One set of instances may be erroneous. Further investigation required.

Version: 7 September 2013; see <http://Ytree.MoreleyDNA.com> for latest.

2488 → 109174, 139697, 187172, 24273, 29523, 89888*

2489 → R1b1a2a1a2c1j1 L555/S393 [4/4], L557/S394 [4/4]

2490 → N114612

2491 ?→ R1b1a2a1a2c1j1-1 L561 [3/3]

2492 → 22874, 3874, 65048

2493 ?→ R1b1a2a1a2c1j-1 L583 [1/1]

2494 → 193834

2495 → R1b1a2a1a2c1k L1335/S530 [51/51]

2496 → 19706 (Unexpected negative call: L69- [18 levels above, at IJK].)

2497 → R1b1a2a1a2c1k-1 (between R1b1a2a1a2c1k-1 and R1b1a2a1a2c1k1: CTS6838 [36/36], CTS7030 [35/35])

2498 → 112391*, 113433*, 14006*, 228773*, 36081*, 65511*, 66126*, 84796*, 85335*, 94892*, 95769*, N16473*, N68552*

2499 → R1b1a2a1a2c1k1 L1065/CTS11722 [28/55]

2500 → 18 non-Geno kits requiring further testing; 100137*, 106378*, 107327, 143812, 145698*, 191228*, 241056*, 258447, 28273*, 285203*, 36198 (Unexpected negative call: L69- [20 levels above, at IJK]. Duplicate calls: L159, L176, M64.), 57711*, 95886, B1047*, H1084*, N104752, N104906*, N114709*, N115263*, N115903*, N25121*, N31582*, N36830, N44383, N5620, N5647*, N75305*

2501 → R1b1a2a1a2c1k1a L743 [7/7]

2502 → 166440, 197448, 197929, 227382, 270944, 63127 (Unexpected negative call: L69- [21 levels above, at IJK].), 9548

2503 → R1b1a2a1a2c1k1-1 CTS11556^R [1/1]

2504 → 230483

2505 → R1b1a2a1a2c1k1-2[△] CTS6601^R [1/1]

2506 → 48641

2507 → R1b1a2a1a2c1k1-3[△] PF5236 [1/1]

2508 → 287689

2509 → R1b1a2a1a2c1l¹²³ CTS4466 [32/33]

2510 → 191515*, 196206*, 202776*, 249476, 284952, N115171

2511 → R1b1a2a1a2c1l-1 CTS3974 [10/10], CTS5714 [24/24]

2512 → 108108, 11211*, 115485, 148516, 167276*, 169169, 179653*, 195090, 196882, 21418, 232531*, 31143*, 32013*, 32032*, 36683*, 75606*, 88489*, 8927*, N45540*

2513 → R1b1a2a1a2c1l-1-1[△] L270^R [1/1]

2514 → 154255

2515 → R1b1a2a1a2c1l-1-2 CTS8358 [4/4] (no nearby negative results)

2516 → 210257, 229625, 290447, N59178

2517 → R1b1a2a1a2c1l-2¹²⁴ F2517 [1/2], Z454^R [2/2]

2518 → 214080, 251695

2519 → R1b1a2a1a2c1l-3 L247^R [1/1]

2520 → 121376

2521 → R1b1a2a1a2c1m CTS2457^R [4/4]

2522 → 159823, 159824, 96153, N112842

2523 → R1b1a2a1a2c1-1 Z2542/CTS8221 [18/18] (between R1b1a2a1a2c and R1b1a2a1a2c1)

2524 → 115893*, 16114, 173877 (Unexpected negative call: L69- [18 levels above, at IJK].), 179426*, 186947*, 196841, 198135, 227117*, 26059, 30949, 365*, E5945 (Duplicate call: L159.), N76898*, N8772

2525 → R1b1a2a1a2c1n F110^R [1/1], L147^R [1/1], L679 [1/1]

2526 → 170191

2527 → R1b1a2a1a2c1-1-1[△] CTS3386 [4/4]

2528 → 196841, 251710, N113768, N113851, N114672

2529 → R1b1a2a1a2c1-1-2[△] L580 [1/1]

2530 → 173880

2531 ?→ R1b1a2a1a2c1-1-3¹²⁵ L1068^R [1/1] (no nearby negative results)

2532 → N55408

2533 → R1b1a2a1a2c1-2[△] PF88^R [1/1], PF3434^R [1/1]

2534 → 131334

2535 → R1b1a2a1a2c1-3[△] PF5191^R [1/1]

2536 → 289737

2537 → R1b1a2a1a2c1-4[△] L596/PF6907/S292^R [1/1]

2538 → 24567

2539 ?→ R1b1a2a1a2c1-5[△] L344^R [1/1]

2540 → 9875 (Unexpected negative call: L69- [18 levels above, at IJK].)

2541 → R1b1a2a1a2c2 DF63/S522 [17/17]

2542 → 174395*, 191950, 208171, 229499, 232541, 31903* (Unexpected negative call: L69- [17 levels above, at IJK].), 36886*, 8042*, N11946*, N90495*

2543 → R1b1a2a1a2c2a CTS6919 [6/6]

2544 → 172350, 49976, N110523, N51736, N66966 (Unexpected negative call: L69- [18 levels above, at IJK].), N76446

2545 → R1b1a2a1a2c2-1 F3901 [1/1]

2546 → 14713

2547 → R1b1a2a1a2c-1[△] PF4341^R [1/1]

2548 → 60163

2549 → R1b1a2a1a2c-2[△] Z117 [2/2]

2550 → 23704, N40691

2551 → R1b1a2a1a2c-3[△] CTS2759 [1/1]

2552 → 37201 (Unexpected negative call: L69- [17 levels above, at IJK].)

2553 → R1b1a2a1a2c-4[△] PF7379 [1/1]

2554 → 3204

2555 → R1b1a2a1a2c-5¹²⁶ P37^R [1/1]

2556 → N69669

2557 ?→ R1b1a2a1a2c-6[△] L1333 [1/1]

2558 → 125313

2559 ?→ R1b1a2a1a2c-7[△] L526 [1/1], L1406 [1/1], L1408 [1/1] (no nearby negative results)

2560 → 64047

¹²³ The expert opinion is that CTS5714 and F2517 are prone to no-calls on the Geno 2.0 chip and are for the moment phylogenetically equivalent to CTS4466; see the R1b-L21 project group's discussion.

¹²⁴ Z454 also found in nearby clade R1b1a2a1a2c1g2a-1 (line 2460 on page 45). One set of instances may be erroneous. Further investigation required.

¹²⁵ L1068 also found in nearby clade R1b1a2a1a2e-1 (line 1868 on page 37). One set of instances may be erroneous. Further investigation required.

¹²⁶ P37 also found in nearby clade R1b1a2a1a2b1c-3 (line 2274 on page 42). One set of instances may be erroneous. Further investigation required.

2.2 Experimental Y tree (automated, using Full Genomes demo results)

Notice

This phylogeny uses ISOGG Y-DNA Haplogroup Tree version 8.75(6 September 2013) [8] as a starting point. ISOGG does not sponsor or endorse this experimental tree. Please do not use this tree to make any SNP purchasing decisions.

This tree will become more meaningful as more datasets become available. This is a proof-of-concept tree, to demonstrate that the algorithm used to produce the tree from Section 2.1 can also be applied to the SNP calls from the Full Genomes demo dataset. The quality of these Full Genomes calls remains to be seen. This algorithm does *not* analyse the Full Genomes raw data to discover new SNPs. This algorithm does not yet use Full Genomes calls marked as no-calls or "ambiguous" – it is just not possible to correct for these gaps when there are only two kits in the dataset. The list of SNP aliases used as an input for this algorithm is known to be incomplete, so some mutations are reported twice, under different names. Tree nodes not yet touched by tested kits have been excluded.

This tree is for personal, non-commercial use. It is to be distributed according to the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported license, with the additional condition that it may not be used in Y-subclade prediction software without the author's prior consent.

2561 Root (Y-Adam) (either between Y-chromosomal Adam and R1, or consistently mis-called: CTS358/YSC0001270 [2/2], CTS655 [2/2], CTS1037 [2/2], CTS1108 [2/2], CTS1169 [2/2], CTS1367 [2/2], CTS1468 [2/2], CTS1795 [2/2], CTS1907 [2/2], CTS1932 [2/2], CTS1939 [2/2], CTS2041 [2/2], CTS2097 [2/2], CTS2220 [2/2], CTS2397 [2/2], CTS2426 [2/2], CTS2502 [2/2], CTS2619 [2/2], CTS2626 [2/2], CTS2636 [2/2], CTS2637 [2/2], CTS2638 [2/2], CTS2639 [2/2], CTS2663 [2/2], CTS2680 [2/2], CTS2908 [2/2], CTS2913 [2/2], CTS2988 [2/2], CTS2992 [2/2], CTS3048 [2/2], CTS3067 [2/2], CTS3075 [2/2], CTS3123 [2/2], CTS3175 [2/2], CTS3229 [2/2], CTS3231 [2/2], CTS3316 [2/2], CTS3321 [2/2], CTS3446 [2/2], CTS3509 [2/2], CTS3597 [2/2], CTS3622 [2/2], CTS3649 [2/2], CTS3650 [2/2], CTS3697 [2/2], CTS3736 [2/2], CTS3775 [2/2], CTS3813 [2/2], CTS3818 [2/2], CTS3830 [2/2], CTS3861 [2/2], CTS3944 [2/2], CTS4265 [2/2], CTS4267 [2/2], CTS4557 [2/2], CTS4862 [2/2], CTS4969 [2/2], CTS5264 [2/2], CTS5418 [2/2], CTS5432 [2/2], CTS5673 [2/2], CTS5750 [2/2], CTS5808 [2/2], CTS5838 [2/2], CTS6009 [2/2], CTS6878 [2/2], CTS6948 [2/2], CTS6985 [2/2], CTS7002 [2/2], CTS7244 [2/2], CTS7275 [2/2], CTS7481 [2/2], CTS7876 [2/2], CTS7880 [2/2], CTS7886 [2/2], CTS7981 [2/2], CTS8127/YSC0001289 [2/2], CTS8350 [2/2], CTS8507 [2/2], CTS8508 [2/2], CTS8626 [2/2], CTS8896 [2/2], CTS9162 [2/2], CTS9200 [2/2], CTS9278 [2/2], CTS9495 [2/2], CTS9534 [2/2], CTS9733 [2/2], CTS10213 [2/2], CTS10290 [2/2], CTS10348 [2/2], CTS10976 [2/2], CTS11150 [2/2], CTS11370 [2/2], CTS11819 [2/2], CTS11821 [2/2], CTS12027 [2/2], CTS12028 [2/2], CTS12138 [2/2], CTS12299 [2/2], CTS12364 [2/2], CTS12383 [2/2], CTS12386 [2/2], CTS12387 [2/2], CTS12388 [2/2], CTS12430 [2/2], CTS12444 [2/2], CTS12454 [2/2], CTS12456 [2/2], CTS12457 [2/2], CTS12458 [2/2], CTS12524 [2/2], CTS12648 [2/2], CTS12684 [2/2], F28 [2/2], F91 [2/2], F102 [2/2], F132 [2/2], F154 [2/2], F184 [2/2], F185 [2/2], F245 [2/2], F370 [2/2], F459 [2/2], F521 [2/2], F524 [2/2], F536 [2/2], F653 [2/2], F675 [2/2], F680 [2/2], F686 [2/2], F773 [2/2], F929 [2/2], F1089 [2/2], F1149 [2/2], F1285 [2/2], F1416 [2/2], F1586 [2/2], F1660 [2/2], F1765 [2/2], F1857 [2/2], F2006 [2/2], F2245 [2/2], F2548 [2/2], F2964 [2/2], F3026 [2/2], F3254 [2/2], F3512 [2/2], F3561 [2/2], F3584 [2/2], F3616 [2/2], F3689 [2/2], L58 [2/2], L74 [2/2], L76 [2/2], L88 [0/2], L103 [2/2], L104 [2/2], L105 [2/2], L108 [2/2], L110 [2/2], L111 [2/2], L113 [2/2], L114 [2/2], L115 [2/2], L150/PF6274 [1/2], L248 [2/2], L313 [2/2], L352 [2/2], L364 [2/2], L380 [2/2], L406 [2/2], L469 [2/2], L543 [2/2], L737 [2/2], L760 [2/2], L819 [2/2], L821 [2/2], L851 [2/2], L875 [2/2], L882 [2/2], L929 [2/2], L978 [2/2], L1028 [2/2], L1071 [2/2], L1074 [2/2], L1164 [2/2], L1165 [2/2], L1166 [2/2], L1179 [2/2], L1185 [2/2], L1220 [2/2], L1273 [2/2], L1346 [2/2], L1347 [2/2], L1352 [2/2], M251 [2/2], PAGES00024 [2/2], PAGES00026 [2/2], PAGES00029 [2/2], PAGES00037 [2/2], PAGES00038 [2/2], PAGES00080 [2/2], PAGES00081 [2/2], PF93 [2/2], PF121 [2/2], PF129 [2/2], PF359 [2/2], PF370 [2/2], PF375 [2/2], PF382 [2/2], PF394 [2/2], PF422 [2/2], PF424 [2/2], PF428 [2/2], PF479 [2/2], PF482 [2/2], PF484 [2/2], PF488 [2/2], PF494 [2/2], PF506 [2/2], PF519 [2/2], PF526 [2/2], PF535 [2/2], PF575 [2/2], PF606 [2/2], PF607 [2/2], PF614 [2/2], PF618 [2/2], PF682 [2/2], PF699 [2/2], PF702 [2/2], PF1107 [2/2], PF1156 [2/2], PF1159 [2/2], PF1193 [2/2], PF1197 [2/2], PF1319 [2/2], PF1320 [2/2], PF1342 [2/2], PF1384 [2/2], PF1386 [2/2], PF1389 [2/2], PF1390 [2/2], PF1391 [2/2], PF1401 [2/2], PF1403 [2/2], PF1404 [2/2], PF1405 [2/2], PF1408 [2/2], PF1413 [2/2], PF1414 [2/2], PF1415 [2/2], PF1417 [2/2], PF1418 [2/2], PF1419 [2/2], PF1420 [2/2], PF1426 [2/2], PF1632 [2/2], PF2276 [2/2], PF2587 [2/2], PF2588 [2/2], PF2589 [2/2], PF2590 [2/2], PF2592 [2/2], PF2594 [2/2], PF2595 [2/2], PF2596 [2/2], PF2597 [2/2], PF2598 [2/2], PF2601 [2/2], PF2603 [2/2], PF2604 [2/2], PF2605 [2/2], PF2606 [2/2], PF2607 [2/2], PF2609 [2/2], PF2610 [2/2], PF2612 [2/2], PF2613 [2/2], PF2614 [2/2], PF2616 [2/2], PF2619 [2/2], PF2620 [2/2], PF2621 [2/2], PF2622 [2/2], PF2626 [2/2], PF2627 [2/2], PF2628 [2/2], PF2629 [2/2], PF2630 [2/2], PF2633 [2/2], PF2634 [2/2], PF2635 [2/2], PF2636 [2/2], PF2637 [2/2], PF2638 [2/2], PF2639 [2/2], PF2640 [2/2], PF2641 [2/2], PF2642 [2/2], PF2644 [2/2], PF2645 [2/2], PF2646 [2/2], PF2647 [2/2], PF2648 [2/2], PF2650 [2/2], PF2651 [2/2], PF2652 [2/2], PF2653 [2/2], PF2654 [2/2], PF2656 [2/2], PF2658 [2/2], PF2660 [2/2], PF2663 [2/2], PF2666 [2/2], PF2668 [2/2], PF2670 [2/2], PF2673 [2/2], PF2674 [2/2], PF2679 [2/2], PF2682 [2/2], PF2683 [2/2], PF2684 [2/2], PF2685 [2/2], PF2686 [2/2], PF2687 [2/2], PF2688 [2/2], PF2689 [2/2], PF2690 [2/2], PF2691 [2/2], PF2692 [2/2], PF2693 [2/2], PF2694 [2/2], PF2695 [2/2], PF2696 [2/2], PF2698 [2/2], PF2700 [2/2], PF2701 [2/2], PF2703 [2/2], PF2707 [2/2], PF2708 [2/2], PF2709 [2/2], PF2710 [2/2], PF2712 [2/2], PF2713 [2/2], PF2714 [2/2], PF2716 [2/2], PF2718 [2/2], PF2719 [2/2], PF2720 [2/2], PF2722 [2/2], PF2723 [2/2], PF2727 [2/2], PF2728 [2/2], PF2729 [2/2], PF2730 [2/2], PF2731 [2/2], PF2732 [2/2], PF2733 [2/2], PF2735 [2/2], PF2736 [2/2], PF2737 [2/2], PF2738 [2/2], PF2739 [2/2], PF2740 [2/2], PF2742 [2/2], PF2743 [2/2], PF2744 [2/2], PF2750 [2/2], PF2751 [2/2], PF2752 [2/2], PF2753 [2/2], PF2755 [2/2], PF2756 [2/2], PF2757 [2/2], PF2758 [2/2], PF2761 [2/2], PF2763 [2/2], PF2766 [2/2], PF2767 [2/2], PF2768 [2/2], PF2769 [2/2], PF2770 [2/2], PF2771 [2/2], PF2772 [2/2], PF2774 [2/2], PF3494 [2/2], PF3495 [2/2], PF3496 [2/2], PF3497 [2/2], PF3498 [2/2], PF3500 [2/2], PF3513 [2/2], PF3518 [2/2], PF3538 [2/2], PF3561 [2/2], PF3563 [2/2], PF3680 [2/2], PF5459 [2/2], PF5460 [2/2], PF5461 [2/2], PF5463 [2/2], PF5464 [2/2], PF5469 [2/2], PF5470 [2/2], PF5472 [2/2], PF5473 [2/2], PF5474 [2/2], PF5475 [2/2], PF5476 [2/2], PF5477 [2/2], PF5481 [2/2], PF5482 [2/2], PF5483 [2/2], PF5484 [2/2], PF5485 [2/2], PF5486 [2/2], PF5487 [2/2], PF5488 [2/2], PF5489 [2/2], PF5490 [2/2], PF5491 [2/2], PF5494 [2/2], PF5495 [2/2], PF5497 [2/2], PF5498 [2/2], PF5499 [2/2], PF5500 [2/2], PF5501 [2/2], PF5503 [2/2], PF5505 [2/2], PF5506 [2/2], PF5507 [2/2], PF5509 [2/2], PF5511 [2/2], PF5512 [2/2], PF5513 [2/2], PF5845 [2/2], PF5846 [2/2], PF5848 [2/2], PF5849 [2/2], PF5850 [2/2], PF5852 [2/2], PF5855 [2/2], PF5857 [2/2], PF5858 [2/2], PF5859 [2/2], PF5861 [2/2], PF5862 [2/2], PF5867 [2/2], PF5868 [2/2], PF5869 [2/2], PF5870 [2/2], PF5872 [2/2], PF5876 [2/2], PF5877 [2/2], PF5878 [2/2], PF5880 [2/2], PF5881 [2/2], PF5883 [2/2], PF5885 [2/2], PF5889 [2/2], PF5890 [2/2], PF5892 [2/2], PF5893 [2/2], PF5894 [2/2], PF5895 [2/2], PF5896 [2/2], PF5897 [2/2], PF5905 [2/2], PF5906 [2/2], PF5912 [2/2], PF5913 [2/2], PF5914 [2/2], PF5915 [2/2], PF5916 [2/2], PF5918 [2/2], PF5919 [2/2], PF5920 [2/2], PF5921 [2/2], PF5922 [2/2], PF5924 [2/2], PF5926 [2/2], PF5929 [2/2], PF5930 [2/2], PF5934 [2/2], PF5935 [2/2], PF5937 [2/2], PF5938 [2/2], PF5940 [2/2], PF5944 [2/2], PF5945 [2/2], PF5949 [2/2], PF5950 [2/2], PF5951 [2/2], PF5952 [2/2], PF5954 [2/2], PF5955 [2/2], PF5956 [2/2], PF5957 [2/2], PF5958 [2/2], PF5959 [2/2], PF5960 [2/2], PF5961 [2/2], PF5963 [2/2], PF5967 [2/2], PF5969 [2/2], PF5970 [2/2], PF5971 [2/2], PF5972 [2/2], PF5973 [2/2], PF5975 [2/2], PF5977 [2/2], PF5978 [2/2], PF5980 [2/2], PF5981 [2/2], PF5983 [2/2], PF5984 [2/2], PF5985 [2/2], PF5986 [2/2], PF5987 [2/2], PF5988 [2/2], PF5990 [2/2], PF5991 [2/2], PF5992 [2/2], PF5993 [2/2], PF5994 [2/2], PF5996 [2/2], PF5999 [2/2], PF6002 [2/2], PF6013 [2/2], PF6016 [2/2], PF6033 [2/2], PF6034 [2/2], PF6036 [2/2], PF6037 [2/2], PF6042 [2/2], PF6045 [2/2], PF6047 [2/2], PF6050 [2/2], PF6052 [2/2], PF6053 [2/2], PF6054 [2/2], PF6056 [2/2], PF6057 [2/2], PF6062 [2/2], PF6066 [2/2], PF6069 [2/2], PF6073 [2/2], PF6077 [2/2], PF6087 [2/2], PF6110 [2/2], PF6111 [2/2], PF6112 [2/2], PF6114 [2/2], PF6116 [2/2], PF6118 [2/2], PF6120 [2/2], PF6121 [2/2], PF6123 [2/2], PF6124 [2/2], PF6125 [2/2], PF6126 [2/2], PF6131 [2/2], PF6133 [2/2], PF6141 [2/2], PF6143 [2/2], PF6147 [2/2], PF6274/L150 [1/2], PF6548 [2/2], PF6569 [2/2], RS161492 [2/2], V21 [2/2], V41 [2/2], V54 [2/2], V55 [2/2], V104 [2/2], V216 [2/2], V226 [2/2], Y44 [2/2], Y45 [2/2], Y116 [2/2], Y266 [2/2], Y267 [2/2], Y268 [2/2], Y269 [2/2], Y272 [2/2], Y284 [2/2], Y290 [2/2], Y296 [2/2], Y305 [2/2], Y369 [2/2], Y387 [2/2], Y392 [2/2], Y397 [2/2], Y398 [2/2], Y399 [2/2], Y400 [2/2], Y401 [2/2], Y402 [2/2], Y403 [2/2], Y404 [2/2], Y405 [2/2], Y406 [2/2], Y435 [2/2], Y436 [2/2], Y437 [2/2], Y438 [2/2], Y439 [2/2], Y440 [2/2], Y441 [2/2], Y442 [2/2], Y443 [2/2], Y444 [2/2], Y445 [2/2], Y446 [2/2], Y447 [2/2], Y448 [2/2], Y449 [2/2], Y450 [2/2], Y451 [2/2], Y452 [2/2], Y453 [2/2], Y454 [2/2], Y455 [2/2], Y456 [2/2], Y457 [2/2], Y458 [2/2], Y459 [2/2], Y460 [2/2], Y461 [2/2], Y462 [2/2], Y463 [2/2], Y464 [2/2], Y465 [2/2], Y466 [2/2], Y467 [2/2], Y468 [2/2], Y469 [2/2], Y470 [2/2], Y471 [2/2], Y472 [2/2], Y473 [2/2], Y474 [2/2], Y475 [2/2], Y476 [2/2], Y477 [2/2], Y478 [2/2], Y479 [2/2], Y480 [2/2], Y481 [2/2], Y482 [2/2], Y483 [2/2], Y484 [2/2], Y485 [2/2], Y486 [2/2], Y487 [2/2], Y488 [2/2], Y489 [2/2], Y490 [2/2], Y491 [2/2], Y492 [2/2], Y493 [2/2], Y494 [2/2], Y495 [2/2], Y496 [2/2], Y497 [2/2], Y498 [2/2], Y499 [2/2], Y500 [2/2], Y501 [2/2], Y502 [2/2], Y503 [2/2], Y504 [2/2], Y505 [2/2], Y506 [2/2], Y507 [2/2], Y508 [2/2], Y509 [2/2], Y510 [2/2], Y511 [2/2], Y512 [2/2], Y513 [2/2], Y514 [2/2], Y783 [2/2], YSC0000013 [2/2], YSC0000055 [2/2], YSC0000057 [2/2], YSC0000077 [2/2], YSC0000081 [2/2], YSC0000102 [2/2], YSC0000103 [2/2], YSC0000104 [2/2], YSC0000105 [2/2], YSC0000106 [2/2], YSC0000107 [2/2], YSC0000108 [2/2], YSC0000109 [2/2], YSC0000110 [2/2], YSC0000135 [2/2], YSC0000174 [2/2], YSC0000193 [2/2], YSC0000222 [2/2], YSC0000249 [2/2], YSC0000286 [2/2], YSC0000287 [2/2], YSC0000297 [2/2], YSC0000350 [2/2], YSC0000624 [2/2], YSC0000913 [2/2], YSC0

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- 2565 ↳ **BT** L413/PF1409/V31 [2/2], L418 [2/2], L438 [2/2], L440 [2/2], L604/PF1243 [2/2], L957 [2/2], L962 [2/2], L969 [2/2], L970/PF1065 [2/2], **L971** [0/2], L977 [2/2], L1060/PF1021 [2/2], L1061/PF1101 [2/2], L1062/PF302 [2/2], M42 [2/2], M91 [2/2], M94/PF1081 [2/2], **M139** [0/2], M299 [2/2], P97 [2/2], PAGE65/SRY1532/SRY10831^R [1/2], PF1406/V102 [2/2], PF1407/V29 [2/2], PF1410/V235 [2/2], PF1411/V59 [2/2], PF1412/V64 [2/2], PK1 [2/2], V187 [2/2], V202 [2/2]
- 2566 ↳ **CT** CTS109^F [0/2], CTS125^F [0/2], CTS1996^F [0/2], CTS3431^F [0/2], CTS3662^F [0/2], CTS4364^F [0/2], CTS4368 [2/2], CTS4740^F [0/2], CTS5318^F [0/2], CTS5457^F [0/2], CTS5532^F [0/2], CTS6383^F [0/2], CTS6800^F [0/2], CTS6907^F [0/2], CTS7922^F [0/2], CTS7933^F [0/2], CTS8243^F [0/2], CTS8980^F [0/2], CTS9828^F [0/2], CTS10362^F [0/2], CTS11359^F [0/2], CTS11575^F [0/2], M168/PF1416 [2/2], M294 [2/2], P9 [2/2], PF110^F [0/2], PF192^F [0/2], PF212^F [0/2], PF223^F [0/2], PF234^F [0/2], PF258^F [0/2], PF263^F [0/2], PF272^F [0/2], PF278^F [0/2], PF292^F [0/2], PF316^F [0/2], PF325^F [0/2], PF342^F [0/2], PF500^F [0/2], PF667^F [0/2], PF719^F [0/2], PF725^F [0/2], PF779^F [0/2], PF796^F [0/2], PF803^F [0/2], PF815^F [0/2], PF821^F [0/2], PF840^F [0/2], PF844^F [0/2], PF892^F [0/2], PF937^F [0/2], PF951^F [0/2], PF954^F [0/2], PF970^F [0/2], PF1016^F [0/2], PF1029^F [0/2], PF1031^F [0/2], PF1040^F [0/2], PF1046^F [0/2], PF1061^F [0/2], PF1092^F [0/2], PF1097^F [0/2], PF1203^F [0/2], PF1269^F [0/2], PF1276^F [0/2], V9 [2/2], V52 [2/2], V189 [2/2]
- 2567 ↳ **CF** P143 [2/2]
- 2568 ↳ **F** CTS3536 [2/2], CTS3654^F [0/2], CTS3868^F [0/2], CTS3996^F [0/2], CTS4443^F [0/2], CTS6135 [2/2], CTS11726^F [0/2], CTS12632^F [0/2], F719 [2/2], F1046 [2/2], F1209 [2/2], F1302 [2/2], F1320 [2/2], F1329 [2/2], F1704 [2/2], F1714 [2/2], F1753 [2/2], F1767 [2/2], F2048 [2/2], F2075 [2/2], F2142 [2/2], F2155 [2/2], F2402 [2/2], F2587 [2/2], F2688 [2/2], F2710 [2/2], F2837 [2/2], F2985 [2/2], F2993 [2/2], F3111 [2/2], F3136 [2/2], F3335 [2/2], F3556 [2/2], F3692 [2/2], L132 [1/2], L350 [2/2], L468 [2/2], L470 [2/2], L498 [2/2], M89/PF2746 [2/2], M213/P137/PAGE38 [2/2], M235/PAGE80/PF2665 [2/2], P133 [2/2], P134 [2/2], P139 [2/2], P140 [2/2], P142 [2/2], P149 [2/2], P157 [2/2], P161 [2/2], P163 [2/2], P316 [2/2], PF2591 [2/2], PF2593 [2/2], PF2599 [2/2], PF2600 [2/2], PF2602/P141 [2/2], PF2608 [2/2], PF2611 [2/2], PF2615 [2/2], PF2617/P145 [2/2], PF2618/P160 [2/2], PF2623/P146 [2/2], PF2624 [2/2], PF2625/P151 [2/2], PF2631 [2/2], PF2632/P187 [2/2], PF2643 [2/2], PF2655/P138 [2/2], PF2702/P166 [2/2], PF2704/P14 [2/2], PF2706/P158 [2/2], PF2717/P159 [2/2], PF2734/P148 [2/2], PF2741/P135 [2/2], PF2745 [2/2], PF2747 [2/2], PF2748 [2/2], PF2749 [2/2], PF2762/P136 [2/2], PF2770 [2/2], V186 [2/2], V205 [2/2]
- 2569 ↳ **IJK** L15/M523/PF3492/S137 [2/2], L16/M522/PF3493/S138 [2/2], **L69/S163** [0/2], M522/L16/PF3493/S138 [2/2], M523/L15/PF3492/S137 [2/2]
- 2570 ↳ **K** M9 [2/2], PF5480/P132 [2/2], PF5493/P131 [2/2], PF5504/P128 [2/2]
- 2571 ↳ **K(xLT)** M526/PF5979 [2/2]
- 2572 ↳ **P** 92R7 [0/2], CTS3135 [2/2], CTS3358 [2/2], CTS4437^F [0/2], CTS5884^F [0/2], CTS10168^F [0/2], F4 [2/2], F29 [2/2], F83 [2/2], F115 [2/2], F180 [2/2], F212 [2/2], F313 [2/2], F332 [2/2], F344 [2/2], F359 [2/2], F506 [2/2], F556 [2/2], F640 [2/2], F647 [2/2], F671 [2/2], L82 [2/2], L138 [2/2], L268 [2/2], L405 [2/2], L471/PF5989 [2/2], L536/PF5860 [2/2], L721/PF6020 [2/2], L741 [2/2], L768/PF5976/YSC0000274 [2/2], L779/PF5907/YSC0000251 [2/2], M45/PF5962 [2/2], M74/N12 [2/2], P69 [2/2], P207/P27 [2/2], P226/PF5879 [2/2], P228/PF5927 [2/2], P230/PF5925 [2/2], P235/PF5946 [2/2], P237/PF5873 [2/2], P239 [2/2], P240/PF5897 [2/2], P243/PF5874 [2/2], P244 [2/2], P281/PF5941 [2/2], P282/PF5932 [2/2], P283/PF5966 [2/2], P284 [2/2], P295/PF5866/S8 [2/2], **PAGE83** [0/2], PAGES00083 [2/2], PF5465 [2/2], PF5468 [2/2], PF5471 [2/2], PF5851 [2/2], PF5853 [2/2], PF5854 [2/2], PF5865 [2/2], PF5866/P295/S8 [2/2], PF5869 [2/2], PF5871 [2/2], PF5873/P237 [2/2], PF5874/P243 [2/2], PF5879/P226 [2/2], PF5882 [2/2], PF5886 [2/2], PF5887 [2/2], PF5888 [2/2], PF5897/P240 [2/2], PF5925/P230 [2/2], PF5927/P228 [2/2], PF5932/P282 [2/2], PF5941/P281 [2/2], PF5946/P235 [2/2], PF5956 [2/2], PF5957 [2/2], PF5964 [2/2], PF5965 [2/2], PF5966/P283 [2/2], PF5982 [2/2], V231 [2/2], **YSC0000176**^F [0/2], **YSC0000186**^F [0/2], **YSC0000205**^F [0/2], **YSC0000227**^F [0/2], YSC0000251/L779/PF5907 [2/2], YSC0000255/L781/PF5875 [2/2], **YSC0000270**^F [0/2], YSC0000274/L768/PF5976 [2/2], **YSC0000279**^F [0/2]
- 2573 ↳ **R** F33 [2/2], F47 [2/2], F63 [2/2], F82 [2/2], F295 [2/2], F356 [2/2], F652 [2/2], L747 [2/2], M207/PAGE37/PF6038/UTY2 [2/2], P224 [2/2], P227 [2/2], P232 [2/2], PF5953 [2/2], PF6019/P229 [2/2], PF6059/P285 [2/2], **PF6063**^F [0/2], PF6068/P280 [2/2], **S4** [0/2], **S9** [0/2], **YSC0000067**^F [0/2], **YSC0000179**^F [0/2], YSC0000201 [2/2], YSC0000232 [2/2], YSC0000233 [2/2]
- 2574 ↳ **R1** F93 [2/2], F211 [2/2], F378 [2/2], M173/P241/PAGE29 [2/2], M306/S1 [2/2], P231 [2/2], P234 [2/2], P294 [2/2], **PF6007**^F [0/2], PF6113/P242 [2/2], PF6115/P328 [2/2], PF6117/P245 [2/2], PF6128/P225 [2/2], PF6136/P286 [2/2], PF6137/P236 [2/2], PF6142/P233 [2/2], **PF6145**^F [0/2], **YSC0000182**^F [0/2], **YSC0000207**^F [0/2], YSC0000230 [2/2], YSC0000288 [2/2]

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→R1a CTS2907 [1/1], CTS5164 [1/1], CTS8008 [1/1], CTS8851 [1/1], CTS9596 [1/1], CTS10627 [1/1], CTS11734 [1/1], F886 [1/1], F928 [1/1], F1088 [1/1], F1769 [1/1], F2948 [1/1], F3364 [1/1], F3466 [1/1], F3570 [1/1], F3650 [1/1], L62/M513/PF6200 [1/1], L63/M511/PF6203 [1/1], L145/M449/PF6175 [1/1], L146/M420/PF6229 [1/1], L457/PF6191 [1/1], M420/L146/PF6229 [1/1], M449/L145/PF6175 [1/1], M511/L63/PF6203 [1/1], M513/L62/PF6200 [1/1], PF6175/L145/449 [1/1], PF6191/L457 [1/1], PF6200/L62/M513 [1/1], PF6203/L63/M511 [1/1], PF6215 [1/1], PF6229/L146/M420 [1/1] (between R1a and R1a1a1: CTS46 [1/1], CTS262 [1/1], CTS329 [1/1], CTS501 [1/1], CTS570 [1/1], CTS623 [1/1], CTS836 [1/1], CTS903 [1/1], CTS910 [1/1], CTS944 [1/1], CTS975 [1/1], CTS983 [1/1], CTS1274 [1/1], CTS1277 [1/1], CTS1278 [1/1], CTS1340 [1/1], CTS1415 [1/1], CTS1416 [1/1], CTS1417 [1/1], CTS1419 [1/1], CTS1422 [1/1], CTS1619 [1/1], CTS1924 [1/1], CTS1963 [1/1], CTS2132 [1/1], CTS2443 [1/1], CTS2891 [1/1], CTS3004 [1/1], CTS3161 [1/1], CTS3230 [1/1], CTS3527 [1/1], CTS3534 [1/1], CTS3548 [1/1], CTS3551 [1/1], CTS3848 [1/1], CTS3877 [1/1], CTS3943 [1/1], CTS3984 [1/1], CTS4259 [1/1], CTS4465 [1/1], CTS4509 [1/1], CTS4608 [1/1], CTS4764 [1/1], CTS4768 [1/1], CTS4812 [1/1], CTS4885 [1/1], CTS5069 [1/1], CTS5082 [1/1], CTS5273 [1/1], CTS5287 [1/1], CTS5346 [1/1], CTS5347 [1/1], CTS5423 [1/1], CTS5437 [1/1], CTS5454 [1/1], CTS5508 [1/1], CTS5577 [1/1], CTS5648 [1/1], CTS5936 [1/1], CTS5979 [1/1], CTS6423 [1/1], CTS6544 [1/1], CTS6596 [1/1], CTS6686 [1/1], CTS6918 [1/1], CTS7072 [1/1], CTS7191 [1/1], CTS7278 [1/1], CTS7500 [1/1], CTS7559 [1/1], CTS7572 [1/1], CTS7585 [1/1], CTS7659 [1/1], CTS7690 [1/1], CTS7732 [1/1], CTS8052 [1/1], CTS8073 [1/1], CTS8090 [1/1], CTS8321 [1/1], CTS8591 [1/1], CTS8595 [1/1], CTS8636 [1/1], CTS8637 [1/1], CTS8710 [1/1], CTS8797 [1/1], CTS8825 [1/1], CTS9018 [1/1], CTS9108 [1/1], CTS9496 [1/1], CTS9510 [1/1], CTS9515 [1/1], CTS9667 [1/1], CTS9690 [1/1], CTS9739 [1/1], CTS9754 [1/1], CTS9779 [1/1], CTS10042 [1/1], CTS10080 [1/1], CTS10349 [1/1], CTS10353 [1/1], CTS10451 [1/1], CTS10834 [1/1], CTS10847 [1/1], CTS10993 [1/1], CTS11148 [1/1], CTS11184 [1/1], CTS11371 [1/1], CTS11411 [1/1], CTS11530 [1/1], CTS11633 [1/1], CTS11720 [1/1], CTS11853 [1/1], CTS11913 [1/1], CTS11948 [1/1], CTS12010 [1/1], CTS12179 [1/1], CTS12254 [1/1], CTS12276 [1/1], CTS12321 [1/1], CTS12403 [1/1], CTS12404 [1/1], CTS12406 [1/1], CTS12407 [1/1], CTS12431 [1/1], CTS12453 [1/1], CTS12612 [1/1], CTS12639 [1/1], CTS12713 [1/1], CTS12746 [1/1], CTS12803 [1/1], CTS12941 [1/1], CTS12947 [1/1], CTS12972 [1/1], F937 [1/1], F947 [1/1], F989 [1/1], F992 [1/1], F1050 [1/1], F1157 [1/1], F1224 [1/1], F1345 [1/1], F1545 [1/1], F1808 [1/1], F2215 [1/1], F2234 [1/1], F2328 [1/1], F2684 [1/1], F2901 [1/1], F2957 [1/1], F2997 [1/1], F3032 [1/1], F3044 [1/1], F3105 [1/1], F3159 [1/1], F3166 [1/1], F3185 [1/1], F3194 [1/1], F3197 [1/1], F3337 [1/1], F3398 [1/1], F3494 [1/1], F3551 [1/1], F3564 [1/1], F3568 [1/1], F3644 [1/1], F4099 [1/1], F4138 [1/1], L112 [1/1], L319 [1/1], L342/S278 [1/1], L348 [1/1], L349 [1/1], L566 [1/1], L777 [1/1], L1067 [1/1], PAGES00007 [1/1], PF50 [1/1], PF67 [1/1], PF362 [1/1], PF363 [1/1], PF365 [1/1], PF366 [1/1], PF384 [1/1], PF426 [1/1], PF427 [1/1], PF429 [1/1], PF430 [1/1], PF473 [1/1], PF474 [1/1], PF475 [1/1], PF476 [1/1], PF478 [1/1], PF480 [1/1], PF486 [1/1], PF503 [1/1], PF518 [1/1], PF524 [1/1], PF539 [1/1], PF553 [1/1], PF582 [1/1], PF610 [1/1], PF6140 [1/1], PF1144 [1/1], PF1180 [1/1], PF1199 [1/1], PF1265 [1/1], PF1321 [1/1], PF1325 [1/1], PF1331 [1/1], PF1340 [1/1], PF1343 [1/1], PF1345 [1/1], PF2988 [1/1], PF5514 [1/1], PF5968 [1/1], PF6041 [1/1], PF6093 [1/1], PF6095 [1/1], PF6102 [1/1], PF6149 [1/1], PF6151 [1/1], PF6152 [1/1], PF6153 [1/1], PF6154 [1/1], PF6156 [1/1], PF6157 [1/1], PF6158 [1/1], PF6159 [1/1], PF6160 [1/1], PF6162 [1/1], PF6163 [1/1], PF6164 [1/1], PF6165 [1/1], PF6167 [1/1], PF6168 [1/1], PF6169 [1/1], PF6170 [1/1], PF6172 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↳R1a1 L122/M448/PF6237 [1/1], M448/L122/PF6237 [1/1], M459/PF6235 [1/1], M516/L120 [1/1], PAGE65/SRY1532/SRY10831^{bR} [1/1]
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 ↳R1a1a1 M417 [1/1], PAGE7 [0/1]
 ↳FGdemo2

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