Report on the VAN_TUYL Surname Project Y-STR Results

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Abstract: Recent data for two descendants of Ott van Tuyl has been added to the project, bringing the total number of Gameren Van Tuyl descendants tested to five. Of these, one is a known descendant of Abraham Van Tuyl [VTC 1.7][1] and three are descended from his brother Isaac [VTC 1.8]. It now appears twice as likely that the twins Abraham and Isaac were fraternal twins as compared to identical twins, a fact which supports the records-based genealogy of the project member referred to here as "4 VT".

Summary

Five men named "Van Tuyl" or "Van Tyle" have now been tested for Y-chromosome Short Tandem Repeats [Y-STR] and Single Nucleotide Polymorphisms [SNPs]. SNP Results indicate they are all members of the P-312 Clade, a group closely associated with Western Europe and the British Isles, and that the Van Tuyl family to which they belong is in no way related to the noble family Van Tuyll van Serooskerken.[2]

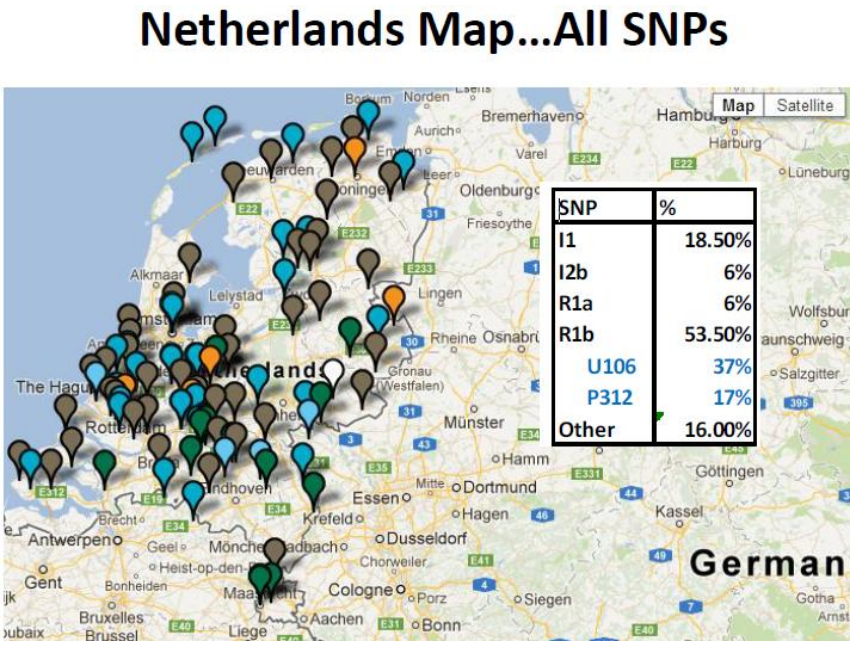


Fig. 1 – The Van Tuyls belong to haplogroup R1b/P312, the third most common SNP haplogroup associated with ancestry in The Netherlands. This clade came into existence some 130 generations (~4000 years) ago. The Most Recent Common Ancestor [MRCA] for the five tested men is Ott van Tuyl of Gameren, The Netherlands, who lived in the 17th century.

[1] The nomenclature refers to that used in the American Genealogy section of *A Van Tuyl Chronicle.* http://books.google.com/books/about/A_Van_Tuyl_chronicle.html?id=K49YAAAAMAAJ

[2] http://www.roryvantuyl.com/PDFs/VT-VTVS%20summary.pdf

The Y-STR test which clearly shows the relatedness of the five project members measures benign minor variations on the Y-chromosome, the part of the genome that controls the conversion of a fetus to the male sex after 6 to 7 weeks of gestation. These variations simply count the number of times certain inactive 4-letter segments of the genetic code repeat themselves in the Y-Chromosome. In contrast to the *Genes*, the active parts of the Y-chromosome which determine sex characteristics, these *short tandem repeats* mutate fairly rapidly, on the order of once every 100 - 900 generations at each location [usually referred to as a *locus* (pl. loci)]. By measuring 37 of these loci and searching for certain evolved combinations of STRs, we can identify related men with high accuracy. Y-STR numbers for the 5 members of the VAN_TUYL project are shown here:

	1	2	3	4	5	6	7	8	9	10	11	12
Name	**DYS393**	**DYS390**	**DYS19**	**DYS391**	**DYS385a**	**DYS385b**	**DYS426**	**DYS388**	**DYS439**	**DYS389i**	**DYS392**	**DYS389b**
1VT	12	24	14	10	11	14	12	12	11	13	13	16
2VT	12	23	14	11	11	14	12	12	11	13	13	17
3VT	12	23	14	11	11	14	12	12	11	14	13	17
4VT	12	23	14	11	11	14	12	12	12	13	13	17
5VT	12	23	14	11	11	14	12	12	11	13	13	16
OVT	**12**	**24**	**14**	**11**	**11**	**14**	**12**	**12**	**11**	**13**	**13**	**16**
AHT	13	24	14	11	11	14	12	12	12	13	13	16

	13	14	15	16	17	18	19	20	21	22	23	24	25
Name	**DYS458**	**DYS459**	**DYS459**	**DYS455**	**DYS454**	**DYS447**	**DYS437**	**DYS448**	**DYS449**	**DYS464a**	**DYS464b**	**DYS464c**	**DYS464d**
1VT	17	9	10	11	11	25	15	20	29	14	15	17	17
2VT	17	9	10	11	11	25	15	20	28	14	15	17	17
3VT	17	9	10	11	11	25	15	20	28	14	15	17	17
4VT	17	9	10	11	11	25	15	20	28	14	15	17	17
5VT	17	9	10	11	11	25	15	20	28	14	15	17	17
OVT	**17**	**9**	**10**	**11**	**11**	**25**	**15**	**20**	**28**	**14**	**15**	**17**	**17**
AHT	17	9	10	11	11	25	15	19	29	15	15	17	17

	26	27	28	29	30	31	32	33	34	35	36	37
Name	**DYS460**	**Y-GATA-H4**	**YCA-IIa**	**YCA-IIb**	**DYS456**	**DYS607**	**DYS576**	**DYS570**	**CDY_1**	**CDY_2**	**DYS442**	**DYS438**
1VT	11	11	19	23	15	15	18	18	38	38	12	13
2VT	11	11	19	23	15	15	18	18	38	39	12	13
3VT	11	11	19	23	15	15	19	18	38	38	12	13
4VT	11	11	19	23	15	15	18	18	37	38	12	13
5VT	11	10	19	23	15	15	18	18	37	38	12	13
OVT	**11**	**11**	**19**	**23**	**15**	**15**	**18**	**18**	**38**	**38**	**12**	**13**
AHT	11	11	19	23	15	15	18	17	37	37	12	12

Fig. 2 – Y-STR table for members of the VAN_TUYL surname project as of March, 2013. Participants are numbered 1VT – 5VT; OVT is our ancestor Ott van Tuyl; AHT is the ancestral haplotype from which we evolved (as inferred from modern measurements). Entries shaded in Gray indicate mutations since the Most Recent Common Ancestor [MRCA] Ott van Tuyl. Entries in Red show where Van Tuyls differ from the ancient ancestral haplotype, and form the basis for a unique *Van Tuyl Haplotype* which identifies men descended from OVT with a high degree of certainty.

Locus	R1b1a2a1a1 Haplotype		Van Tuyl Haplotype	Selection Ratio	Avg. Gen to Mutation
HT Mode				44	
DYS-393	13	>>>>>>>>	12	33	455
DYS-438	12	>>>>>>>>	13	29	625
DYS-448	19	>>>>>>>>	20	18	862
DYS-449	29	>>>>>>>>	28	2	116
DYS-570	17	>>>>>>>>	18	3	158
DYS-439	12	>>>>>>>>	11	2	299
CDY_1	37	>>>>>>>>	38	2	116

116 – 862 Generations Between Mutations

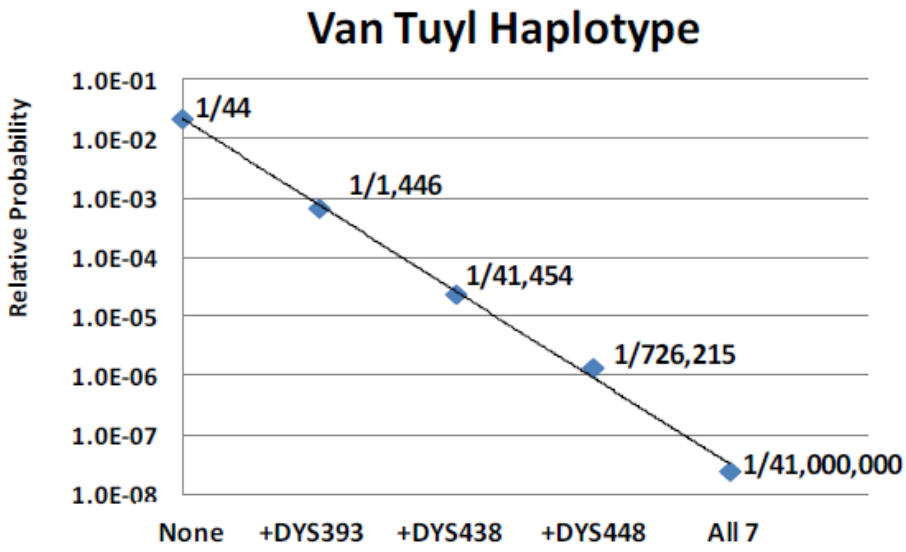


Fig. 3 – The Van Tuyl Haplotype consists of 7 loci which have mutated since the ancient ancestral group some 4000 years ago. All members of today's VAN_TUYL project possess DYS393, DYS438, DYS448 and DYS570 STR values characteristic of the family. The odds of this combination occurring *somewhere* in the population are 1:2,178,000. The odds that any particular man not a descendant of OVT would possess this combination of Y-STRs are infinitesimal.

Combining the DNA data with records-based genealogy (including recent work on 4VT[3] and newly-presented results for 5VT[4] and assuming that the twins Abraham and Isaac were fraternal [see appendix], we expanded the phylogenic tree to include the two new participants, 4VT and 5VT:

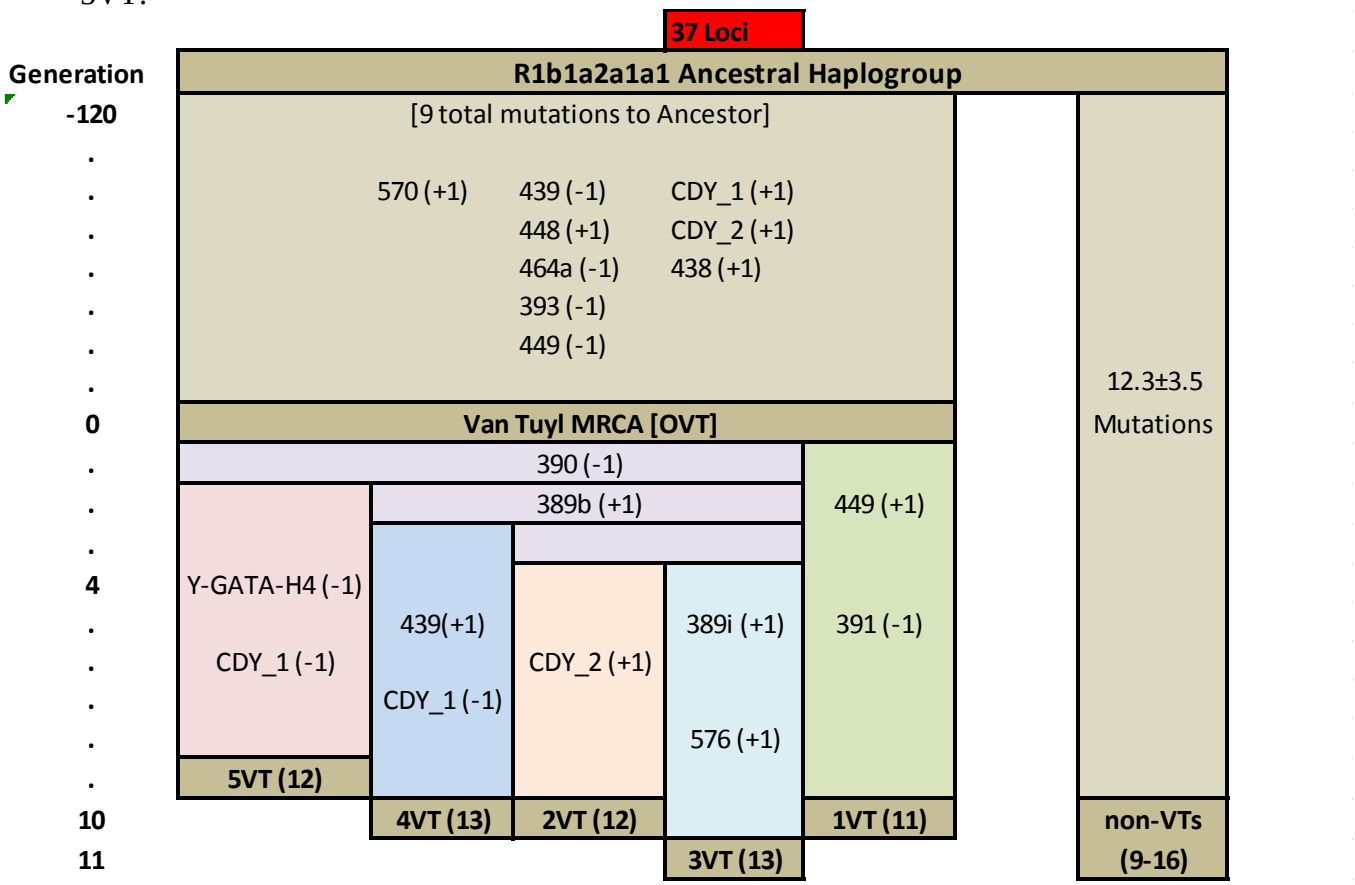


Fig. 4 – Phylogenic Tree of the 5 Van Tuyls, showing the number of STR mutations for each from the MRCA (OVT) and from the Ancestral Haplotype. The average mutation rate prior to OVT was once in 493 generations; after OVT the mutation rate was once in 168 generations. Such variations in rate are common, due to the random nature of the process. The genetic distance between Van Tuyls is 4.4±0.74 mutations; the Genetic distance between Van Tuyl and non-related men descended from the ancestral haplogroup some 4000 years ago is 24.8±0.84 mutations. This phylogeny assumes that Abraham and Isaac Van Tuyl (b. 1681) were fraternal twins [see appendix].

[3] http://www.roryvantuyl.com/PDFs/The%20VanTuyls%20in%20the%20Minisink.pdf
[4] Research of Kirk Ziegler zeegkz@gmail.com

Discussion

Two new members have been added to the VAN_TUYL surname project Y-STR group. New member 5VT has been shown via records-based research[5] to be a direct descendant of the twin Abraham Van Tuyl [VTC 1.7]. Member 4VT was recently inspired by the positive DNA results to revisit and expand his records-based research of the Van Tuyls in the Minisink, New York area. He has built an extremely strong case for direct descent from John Van Tuyl [b. ca. 1717, VTC 1.8.4] and this hypothesis is supported by the DNA evidence [see appendix].

We now have three major branches of the family represented in the DNA project:

1. The Dutch Branch [1VT] descended from Ott van Tuyl through Geerlof Otten van Tuyl;
2. The American Revolutionary Branch [2VT, 3VT, 4VT] descended from twin Isaac Van Tuyl [VTC 1.8] of central Staten Island;
3. The Loyalist Branch [5VT] descended from twin Abraham Van Tuyl [VTC 1.7] of north Staten Island.

Each of these branches is characterized by the following Y-STR values:

Dutch Descendants: DYS389b=16[6], DYS390=24

Descendants of Abraham [VTC 1.7] Van Tuyl: DYS389b=16, DYS390=23

Descendants of Isaac [VTC 1.8] Van Tuyl DYS389b=17, DYS390=23

So future project members who carry the Van Tuyl signature haplotype [DYS393=12; DYC438=13; DYS448=20] can be sorted into one of these three branches based on the above findings.

Conclusion

Two major branches of the American Van Tuyl family have now been characterized by Y-STR haplotype analysis, along with the Dutch Gameren Branch from which they are descended, If Dutch or American Van Tuyls of unknown genealogy present themselves, the VAN_TUYL surname project should be able to help them research their origins.

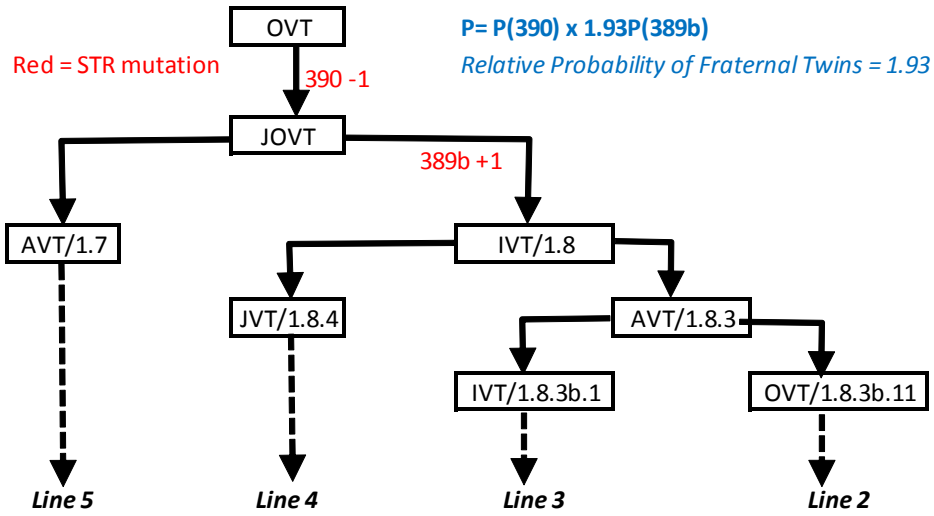
[5] Research of Kirk Ziegler zeegkz@gmail.com
[6] DYS389b is defined as (DYS389ii – DYS389i)

Appendix – Resolving the Twin Issue and Choosing the Ancestor of 4VT

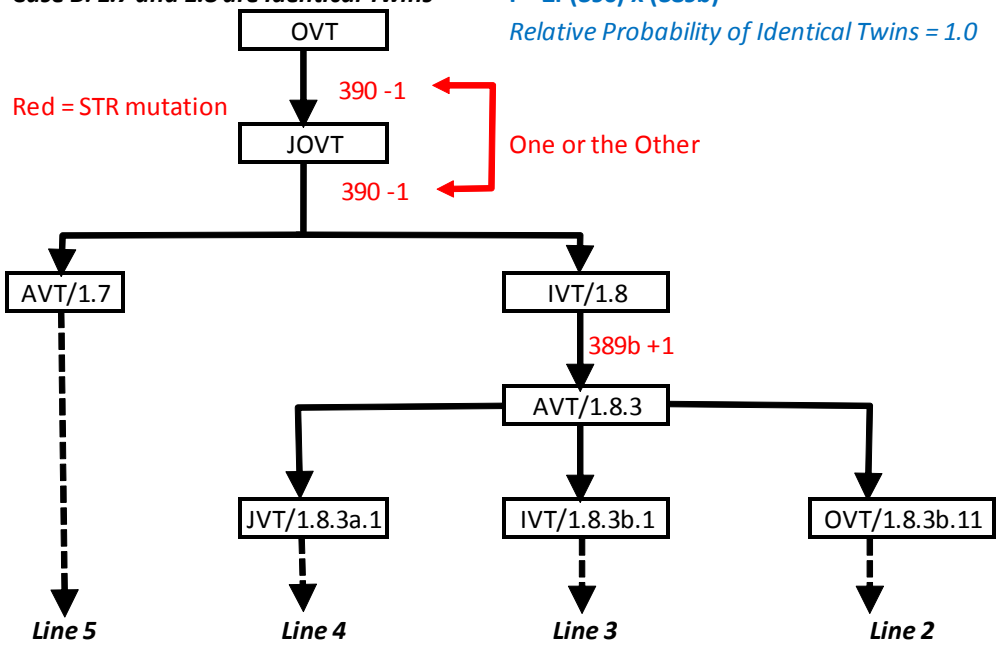
With the results for 5VT, who we know was descended from Abraham Van Tuyl [VTC 1.7], we learned that the mutation 390 (-1) – but not the mutation 389b (+1) - had appeared for the first time in Jan Otten Van Tuyl.[7]

This presented two possible scenarios for the mutations surrounding the twins Abraham and Isaac:

Case A: 1.7 and 1.8 are Fraternal Twins



Case B: 1.7 and 1.8 are Identical Twins



[7] This because 390 (-1) is common to all JOVT descendants, but 389b only to descendants of Isaac VT [VTC1.8].

As it turns out, the relative frequency of identical twins and fraternal twins varies with ethnicity and the age of the mother. In a recent study of Dutch women[8] it was found that whereas women age 17-25 bore about equal numbers of identical and fraternal twins, by the time maternal age had increased to 36-45, the frequency of fraternal twins had nearly doubled. Geertruyt Jans, wife of Jan Otten van Tuyl and the mother of most American Van Tuyls, was in her 40s at the time she gave birth to her last two children, twins Abraham and Isaac.

This being the case, we see that the probabilities for Cases A and B above are nearly identical, meaning there is no reason to prefer one explanation over the other as far as DNA testing is concerned.

However, the records-based genealogical research of 4VT[9] made a convincing case for his ancestor being John Van Tuyl [VTC 1.8.4]. So we have adopted this result.

[8] http://www.tweelingenregister.org/nederlands/verslaggeving/NTR-publicaties_2010/Hoekstra_FS_2010.pdf

[9] http://www.roryvantuyl.com/PDFs/The%20VanTuyls%20in%20the%20Minisink.pdf