Sullivan yDNA

Supports existence of Eoganacht Dynasty

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Chapter 1

Introduction

The existence of the Eoganacht Dynasty is supported by their descendant yDNA member results [1] [1] of those with Eoganacht surnames and specifically Sullivan surnames [2], advances in yDNA testing, meticulously researched historical genealogical time lines of the Eoganachta by Dr. Paul Cotter [3] supported by time to the most recent common ancestor (TMRCA) calculations by Dr. Anatole Klyosov [4].

1.1 yDNA background

yDNA is the male chromosome Haplogroup which is not recombinatory remaining unchanged in the male lineage therefore in patrilineal societies, that trace their family descend by the male lineage and through the family surname after the time of the adoption of surnames that occurred generally between 900 - 1100 AD in Ireland [3]

yDNA is organized into Haplogroups [7] and includes the slower mutating single nucleotide polymorphisms (SNPs) [8] and faster mutating multi-allele markers called short tandem repeats (STRs) [9] which mutate predictably within a range over time making this data especially relevant to yDNA dating and TMRCA calculations. The STR test results for an individual are referred to as a haplotype. Since yDNA is not recombinant, a record of each male's inherited SNPs and STRs is unchanged and may include new SNP or STR mutations in the current generation. This genetic trail is invaluable in tracing the changes in man in general and in a male lineage in specific. Figure 1.1 'Haplogroup Tree' shows the yDNA tree represented by letters A - T with the R1 location of CTS4466 relative

[1] All yDNA results are from Family Tree DNA testing lab[2].

[2] The large number of those members with Sullivan surnames testing under L270.2 along with the presence of all major initial Eoganacht clan surnames helped focus attention on S1121 as possibly being the Eoganacht SNP.

[3] Surnames were chosen, assigned or changed over time. The main sources of surnames are toponymic (a geographical location of their farm, county, town or estate such as Lancaster, Hampshire or Berkley), topographical (a physical characteristic of the land such as Hill or Knolls such as Mary of Wood), relational surnames from the dynasty eponyms that may assume obligation of mutual protection or eligibility of participating in events with certain privileges, personal names from characteristics (Swift, Red and Blunt meaning fair haired), occupational that may include formal or informal licensing (Smith, Hunter or Weaver as examples) names [5][6]. Relational surnames based on dynasty eponyms are unique in that they linked their surnames to their yDNA lineage even before the time that surnames were adopted in the general population therefore have stronger and more closely linked yDNA evidence.

placement on the SNP evolutionary tree. A SNP mutation occurs in a single man and is inherited by his descendants and not found in his father or male siblings;

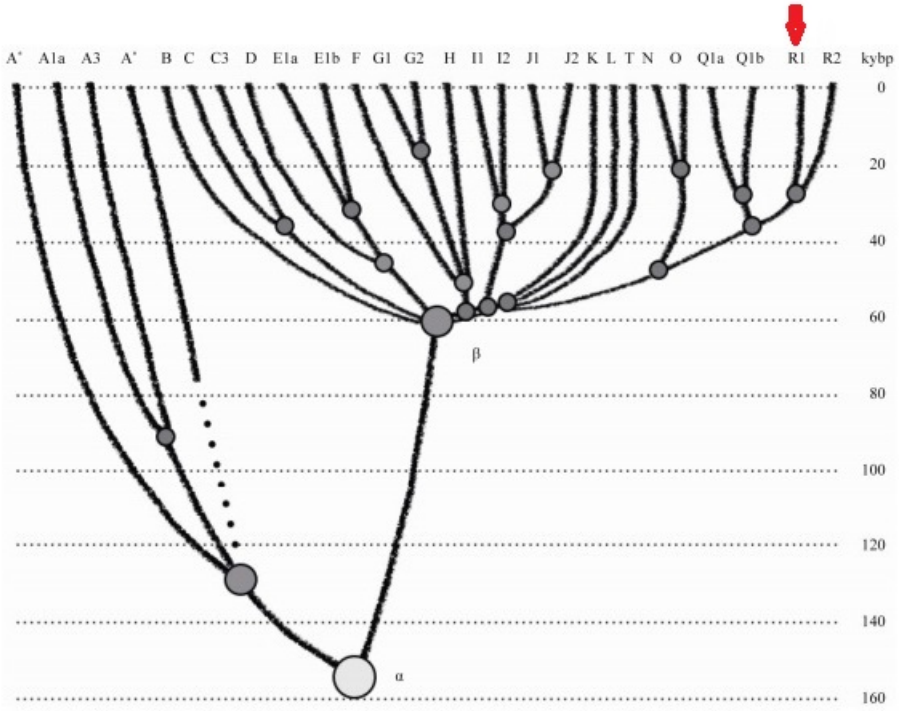

Figure 1.1: Haplogroup Tree[10]

Recent advances in yDNA testing have discovered a multitude of SNPs in member yDNA lab results, as well as lengthening the STR panel results to 111 markers providing exceptional scientific results for comparison purposes.

No longer are conclusions drawn on ancestry without Haplogroup SNP and STR testing. The combinations of surnames for yDNA close matches is difficult to analyze. The study of the past history of a Haplogroup is still a convoluted endeavor needing a multifaceted approach including up to date latest yDNA test results, DNA Genealogy methodology with data analytics and TMRCA calculations applied to historical genealogical timelines.

1.2 Breakthrough discoveries: S1121 and L270.2 SNPs

It is generally accepted by yDNA researchers that the Eoganacht Dynasty is in the R1-CTS4466 Haplogroup which was previously called the South Irish Haplogroup.

On closer scrutiny, the presence of all Eoganacht sept surnames including the Locha Lein, Raithlind, Aine, Glendamnach and Chaisil found under S1121 showed great promise in the S1121 SNP as being the Eoganacht SNP[4]; see Figures 1.2 CTS4466 SNP Hierarchy focused on S1121 and A.1 'CTS4466 SNP Hierarchy with surnames'.

[4]This does not infer that the S1121 results are exclusively Eoganacht descendants but rather that the large number of results with Eoganacht surnames may be able to provide clues as to the Eoganacht ancestral origins.

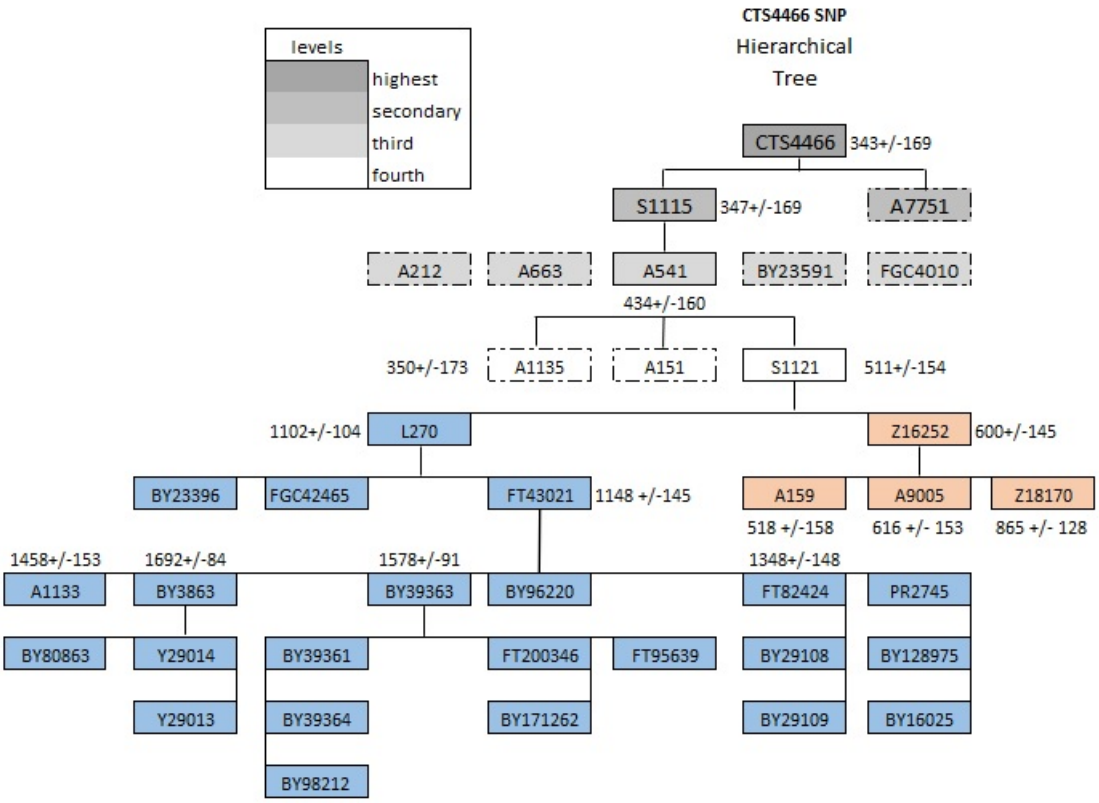

Figure 1.2: CTS4466 SNP Hierarchy focused on S1121

1.3 Methodology

1.3.1 Time to the most recent common ancestor (TMRCA)

Since a SNP occurs in one male, which is inherited only by his descendants, this unique mutation characteristic enables the association of the individual ancestor 'year before date' (ybd) range detection using the TMRCA calculation. The TMRCA method used in this study is the KK calculator [5] developed by Dr. Anatole Klyosov [11]. The STRs or haplotypes are used in the TMRCA calculation to find the date range of when a theoretical common ancestor lived which is very useful for finding the confidence interval (CI) age range of a SNP which can then be linked to historical events.

The KK calculator inputs STR haplotypes (corrected to separate multi-alleles into single alleles) of the same panel length with a minimum of 4 observations required to ensure a reliable TMRCA [6]. Using the S1121 SNP as an example (see Table 1.1 'Example S1121 SNP TMRCA and confidence intervals'), ybd and MOE results are used as follows:

These numbers are interpreted as SNP S1121 having a TMRCA of 511 AD +/- 154 yrs or a CI from 357 - 665 AD.

[5] The KK calculator can be downloaded from https://www.anatole-klyosov.com/ under 'DNA Genealogy TMRCA Calculator' with tutorials available at [11] and TMRCA Case Studies [12].

[6] A tutorial for using the KK calculator is found at the FTDNA TMRCACaseStudies webpage [12]

SNP	ybd	TMRCA	Confidence Interval
SNP	ybd	current date - ybd = TMRCA	lower/upper range TMRCA +/- ybd
S1121	1509	2020 - 1509 = 511 AD	lower range 511 - 154 = 357 AD
"	"	"	upper range 511 + 154 = 665 AD

Table 1.1: Example S1121 SNP TMRCA and confidence intervals

1.3.2 Dataset and analytics

705 CTS4466 positive member results were collected of which 130 were from members who had Eoganacht surnames or 19 percent of the total number of observations; see Figure 1.3 'CTS4466 Statistics by Eoganacht surname and path'. Those who tested with more specific SNPs, enabling further analysis, were a total of 87 observations. [7]

	Count	Category	Comment
	706	Total	
-	567	non-Eoganacht surnames	
=	131	Eoganacht surnames	
-	43	more detail needed	testing CTS4466, A212, A541 and S1121 only [8] and Eoganacht surnames without sept name
=	88	Eoganacht surnames	used in analysis
	528	haplotypes with 111 markers	used in TMRCA calculations

Table 1.2: Dataset Statistics

1.3.3 DNA Genealogy

DNA Genealogy combines member yDNA results, anthroponymy (study of surnames), the descendent surnames of the yDNA lab member results, and family history to provide more insight into their respective ancestors which when fused with data analytics is known as inferring past history of descendants through their similarity to the autochthonous (i.e. indigenous) population of their origins [13].

Building a Haplogroup SNP tree and adding available descendant attributes for family history, surname, surname origin, and ancestral location, provides the information that can help differentiate possible evolutionary paths that can be linked to history supported by the Haplogroup and terminal SNP TMRCAs making the genetic trail more transparent.

By applying a TMRCA CI to a SNP, well researched historical genealogical time frames can be compared for the purpose of linking yDNA descendant member results to history associated with their ancestors.

[7] There were 43 who had tested for CTS4466, A541, and S1121 only which were not included in the analytics since they needed more precise lower level SNP testing or detail.

Total CTS4466 706

Eoganacht Surnames under CTS4466

surname	sept	count	
Carroll	Lein	4	3%
Moriarty	Lein	7	5%
Mahony	Raithlinn	16	12%
ODonnell	Raithlinn	3	2%
ODonoghue	Raithlinn	10	8%
Kirwan	Aine	1	1%
Kirby	Aine	1	1%
OKeeffe	Glendamna	3	2%
McCarthy	Chaisil	20	15%
McCarty	Chaisil	4	3%
McCarthy & McCarty	Chaisil		18%
Sullivan	Chaisil	59	45%
McGill	Chaisil	2	2%
Sullivan and McGill	Chaisil		47%
Corc mac Láire	other	1	1%
131/706 = 19%		131	

Eoganacht surnames under all CTS4466 by path

path	count	percent
CTS4466\	40	31%
A541\	1	1%
A212\	1	1%
A151 \	1	1%
A1135	10	8%
S1121 all	78	60%

	S1121	1	1%
	S1121/Z16252/A159	16	21%
	S1121/Z16252/A9005	15	19%
	S1121/Z16252/Z18170	10	13%
	S1121/L270.2	36	46%
		78	

131

Figure 1.3: CTS4466 Statistics by Eoganacht surname and path

SNP	SubSNP	TMRCA	Margin of Error
S1121		TMRCA 511 AD	+/- 154 yrs
Z16252		TMRCA 600 AD	+/- 145 yrs
Z16252	A159	TMRCA 518 AD	+/- 158 yrs
Z16252	A9005	TMRCA 616 AD	+/- 153 yrs
Z16252	Z18170	TMRCA 865 AD	+/- 128 yrs
L270.2		TMRCA 1102 AD	+/- 104 yrs
Z16252 and L270.2		TMRCA 505 AD	+/- 154 yrs

Table 1.3: TMRCA SNP Calculations under S1121

1.3.4 Eoganacht Dynasty Genealogical Timeline

I conferred with Dr. Paul Cotter [3] regarding the genealogical time line for the Eoganacht Dynasty leaders; see Figure 1.4 'Eoganacht Dynasty Genealogical Timeline'.

The seven Eóghanachta septs are descendants of Prince Eoghan Mór II [71] (born c. 170 AD).

- Eóghanacht Chaisil - O'Sullivan, MacCarthy, plus later: O'Dennehy, MacGillicudy, O'Callaghan, MacAuliffe
- Eóghanacht Locha Lein - O'Moriarty
- Eóghanacht Raithlind - O'Mahoney, O'Donoghue, plus later:
  - O'Long, O'Neill, O'Duggan, O'Feehan, O'Leary, O'Donnell, Mongan, O'Connell, Lynch, O'Hea, O'Cohalane/O'Coughlan, O'Cannifree, O'Bogue, Cahalane, O'Cronin,

O'Flahiffe, O'Flynn, Connelly, O'Callaghan

- Eóghanacht Glendamnach - O'Keefe
- Eóghanacht Aine - O'Kirby
- Eóghanacht Arann (a.k.a. Ninussa) – extinct
- Eóghanacht Ruis Argait – extinct
- (Eóghanacht Airthir Chliach are added to some lists, perhaps erroneously - Ó Dwyer, Ó Quirke)

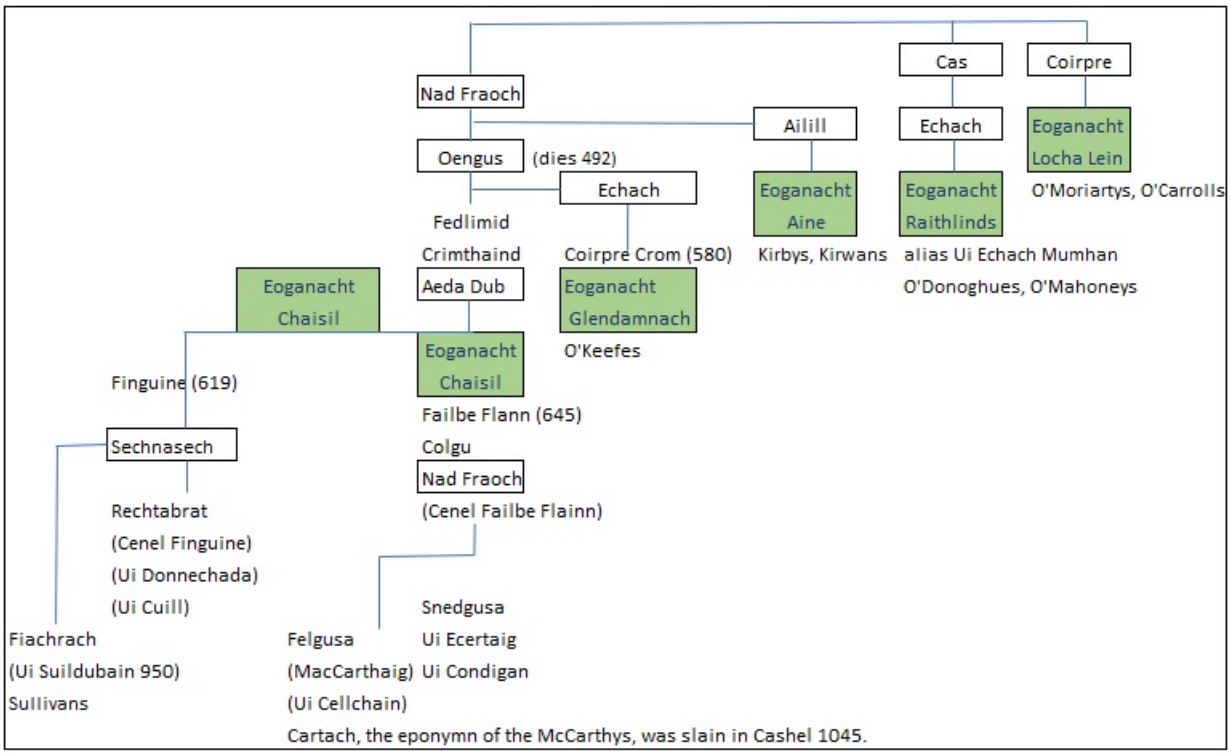

Figure 1.4: Eoganacht Dynasty Genealogical Timeline[3]

This timeline of Eoganacht leadership and sept succession was then over laid onto the S1121 SNP tree with TMRCAs. The confidence interval of each SNP TMRCA coincided with the Eoganacht Dynasty Genealogical Timeline; see Figure 1.5 'Combining the S1121 and Eoganacht Dynasty Genealogical Timeline'. Also noted are the Eoganacht surnames found in CTS4466 SNPs not under S1121 which do not include a pattern of lineage and represent fewer surnames.

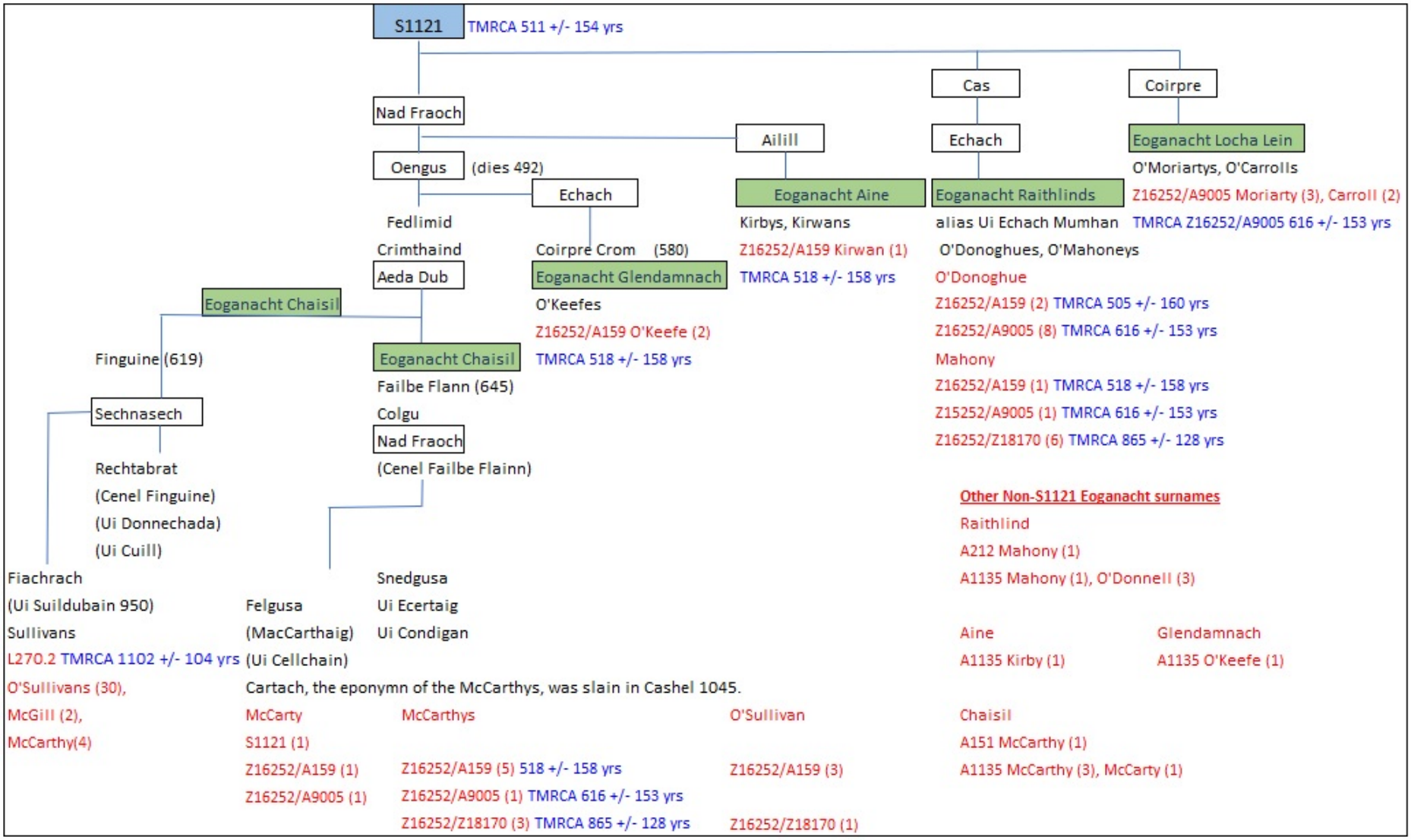

Figure 1.5: Combining the S1121 SNP Tree and Eoganacht Dynasty Genealogical Timeline

1.4 Discussion

The main issue is the lineage of the Eoganachta based on the eponym ancestor, Prince Eoghan Mór II (born c. 170 AD). The A541/A1135 and A541/S1121 are both older than 170 AD and each branch has a number of Eoganacht ancestor surnames. Either A1135 or S1121 could be the Eoganacht SNP based on their respective TMRCAs. There is no evidence in the form of the yDNA of the Eoganacht surnamed descendants that the Eoganacht SNP occurred before either the A1135 or S1121 happened. These SNPs are parallel and their TMRCAs are within a couple hundred years of each other. A SNP occurs in a single man with his descendants inheriting the SNP, either a new SNP appears or existing SNP path was inherited by the eponym of a clan within a sept. The eponym's SNPs could not occur under both A1135 and S1121. The strongest yDNA evidence points to the CTS4466/A541/S1121 as the Eoganacht SNP. The Eoganacht surnames in the descendants of the same surname under CTS4466/A541/S1121 is 78/131 or 60% and CTS4466/A541/A1135 10/131 or 8% of all Eoganacht surnames descendants under CTS4466 with 43/131 or 33 percent needing further testing. Only the S1121 SNP has the more complete list of surnames based on the descendant yDNA with yDNA relationships therefore has a stronger case for being the Eoganacht SNP.

Both A1135 and S1121 could still be indirectly related to the Eoganacht Dynasty eponym Prince Eoghan Mór II with the approximate difference in time being a matter of approximately 500 years. The eponym lineage can still only occur in one location in the SNP tree.

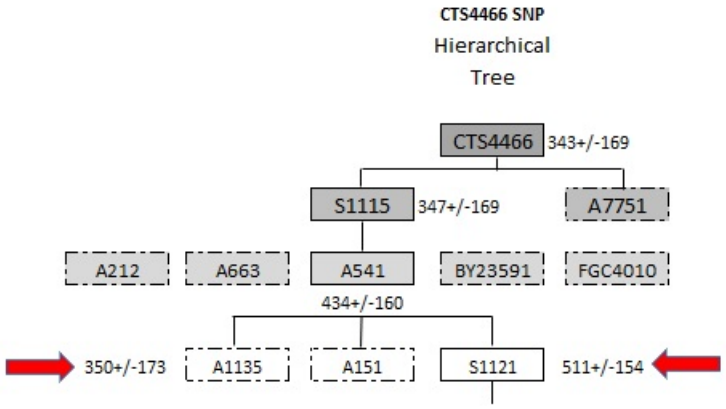

Figure 1.6: TMRCAs of S1121 and A1135

If the Eoganacht surnames exist in multiple branches that are not directly related, the most probable reason is that these ancestors were not yDNA related to the Eoganacht eponyms but were associated or aligned with the eponym's lineage.

1.4.1 S1121 as the Eoganacht SNP

The S1121/Z16252 and S1121/L270.2 have a common ancestor living in 505 AD +/- 154 years which is consistent with historical evidence.

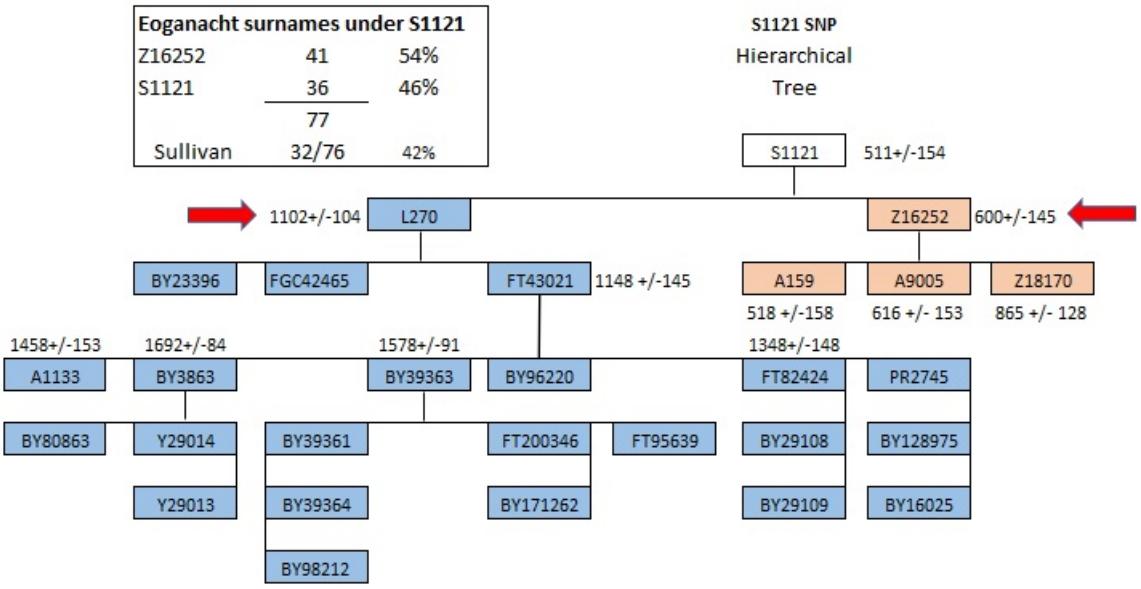

Figure 1.7: Comparing Z16252 v L270

Z16252

The septs under S1121/Z16252 (TMRCA 600 +/- 145 yrs) have a more complicated lineage pattern and also reflect an earlier timeline of the Eoganacht leadership and septs from which their descendants developed more diverse lineages represented by the Locha Lein, Raithlind, Aine, Glendamnach and the Chaisil McCarthys. With the exception of the McCarthys (whose leader died in 1045 AD) these septs and clans existed before the time of the adoption of surnames which may be the predominant reason why the yDNA doesn't align strongly to a single yDNA lineage pattern. Perhaps the adoption of surnames changed our ancestor's behavior and cultural patterns. There are not enough member observations to construct a hypothesis and more testing is needed.

L270.2

The L270.2 (TMRCA 1102 AD +/- 104 yrs) SNP is dominated by Sullivan descendants. Their eponym was Ui Suildubain who lived around 950 AD which reflects the confidence intervals of all TMRCAs of all samples I've calculated for the SNP since it was discovered. Because there is a strong link of the Sullivan descendant yDNA and the surname, there is a strong appearance that the L270.2 SNP may have occurred either in the eponym or directly in the lineage close to the time he lived explaining why 61/131 or 47 percent of all those with Eoganacht surnames under CTS4466 are Sullivan and 32/78 or 41 percent of all Eoganacht surnames under S1121 are Sullivans with only 4/32 under S1121 being non-L270.2 or 13 percent.

1.5 Next Steps

More yDNA evidence from Eoganacht descendants will increase the confidence in the current status of the yDNA of the Sullivan and other Eoganacht descendant surname research. There are 43 yDNA results (testing only CTS4466, A541 or S1121) of those with Eoganacht surnames that need additional downstream SNP testing and STR testing

up to 111 markers. If those with Eoganacht surnames wish to test for their CTS4466 ancestry, the FTDNA CTS4466 panel test would be the best option. A more cautious approach would be to take the RL21 panel test since a majority of Eoganacht surnamed members are not CTS4466. Being a member of the FTDNA 4466&SouthIrish project (whether you are CTS4466 or in another Haplogroup) will ensure that your results will be included in this research.

1.6 Conclusion

The yDNA of Eoganacht surnamed members in the CTS4466 Haplogroup has provided evidence of the existence of the Eoganacht Dynasty that lived in Southern Ireland.

The non-CTS4466 Eoganacht surnamed members outnumber the CTS4466 descendants with 211 results in the FTDNA Eoganacht septs and Sullivan projects 84 to 15 percent respectively. Ancestors from other Haplogroups migrated to Southern Ireland adopting indigenous surnames during and after the time surnames were adopted required for taxation and other purposes around 900-1100 AD. Often the surnames that were chosen to be adopted were to associate with strong leadership and/or established groups like the Eoganachta for their protection. Eventually they would be indistinguishable from the local indigenous population assimilating on their own merits. The common practice of assimilating new clan members was a successful way of keeping the continuity of the septs and clans of the Eoganacht Dynasty and one of the reasons why today those with Sullivan surnames are the most common of those with Eoganacht surnames, as well as one of the most common surnames in Ireland.

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Appendix A

Figures

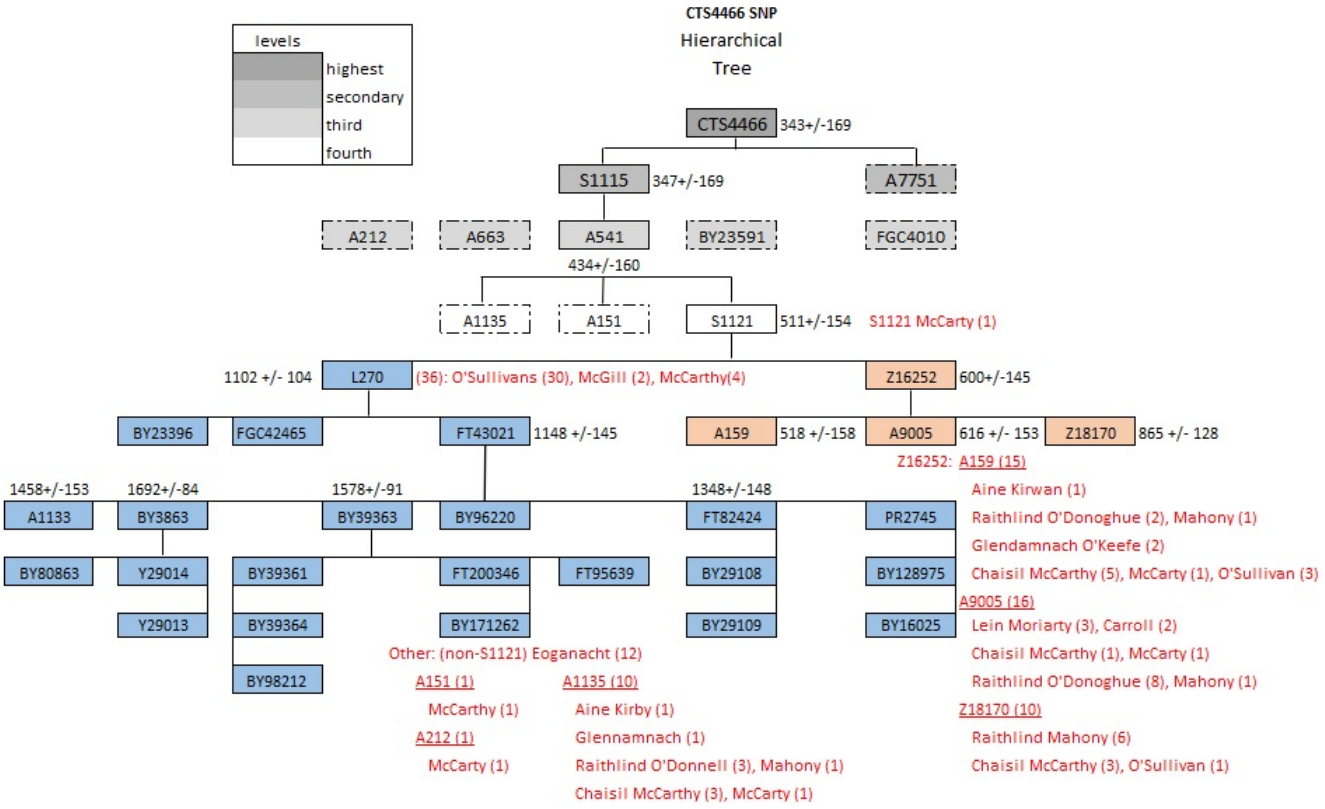

Figure A.1: CTS4466 SNP Hierarchy with surnames

All Statistics

		A541/S1121			A541	A541	A212		
		S1121 only	Z16252	L270.2	A1135	A151		#	%
Locha Lein	Carroll		2					2	0.02
Locha Lein	Moriarty		3					3	0.03
Raithlinn	Mahony		8		1		1	10	0.10
Raithlinn	O'Donnell				3			3	0.03
Raithlinn	O'Donoghue		10					10	0.11
Aine	Kirby				1			1	0.01
Aine	Kirwan		1					1	0.01
Glennamnc	O'Keefe		2		1			3	0.03
Chaisil	McCarthy (+McCarty)	1	11	4	4	1		21	0.23
Chaisil	Sullivan (+McGill)		4	32				36	0.40
		1	41	36	10	1	1	90	

S1121	78	87%	
A1135	10	11%	

Figure A.2: Analytics for Eoganacht yDNA descendants testing for lower level SNPs