

A Set of Distinctive Marker Values Defines a Y-STR Signature for Gaelic Dalcassian Families

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Abstract

Analysis of 25-marker short tandem repeat haplotypes in the Ysearch database reveals a distinctive Y-DNA signature that peaks in frequency in the Irish counties of Tipperary, Clare and Limerick. These counties were the hereditary homelands of the *Dál gCais* families, also called Dalcassian, septs descended from Cas, born CE 347, sixth in descent from Cormac Cas, King of Munster. Dalcassian surnames are more strongly represented with this signature than other surnames. A Y-STR signature for the northern *Uí Néill* lineages was previously identified. In the present paper, we present evidence for the signature of the *Dál gCais*, presently referred to as “*Irish Type III*.”

Introduction

With the established patrilineal transmission of Y-DNA with surnames in Ireland, researchers have for some time sought to find sets of short tandem repeat (STR) marker values that might identify the great ancient families of Ireland. The distinctive STR signature of one Haplogroup R1b cluster was identified as “*North West Irish*” (Wilson, D 2004) and separately and formally (Moore et al 2006) as the “*Irish Modal Haplotype*” (IMH). Wilson also showed the connection of IMH with the *Uí Néill*, kings of medieval Ireland, and specifically descendants of the semi-legendary fifth-century king, Niall of the Nine Hostages. It was later found that this cluster is derived for the single nucleotide polymorphism (SNP), M222, (McEwan, 2006) and was first recognised as the Haplogroup R1b1c7 in the R1b-Tree at ISOGG (2007). The recent identification of other R1b SNPs has resulted in the R1b1c7 (R-M222) Haplogroup having a different nomenclature in each subsequent ISOGG R1b Tree.

Another major dynasty of Ireland was the descendant families of Cas, a semi-legendary king who was born in CE 347. They were known as the *Dál gCais* or Dalcassian families. McEvoy et al (2008) studied 17-marker R1b STR haplotypes looking for patterns of kinship in Munster and concluded there were no significant signatures for the *Dál gCais* or *Eóganacht* septs. This might well be expected if the study only looked at markers where the Dalcassian had no distinctive values.

Proper association of signatures with particular clans or septs requires more markers to be analysed than have been commonly used in early, and even very recent, Y-chromosome population studies. Public databases like Ysearch, Ybase, Sorenson Molecular Genealogy Foundation (SMGF), and Ancestry.com constitute rich hunting grounds for researchers that were not previously available, providing abundant haplotypes of 25, 37, 43, and 67 markers.

A Dalcassian signature is evident when specific STR markers are included in the studied R1b haplotype. Present day possessors of this signature, as found in public databases, trace their ancestors primarily to the Counties of Clare, Tipperary and Limerick and many carry surnames of the Dalcassian families.

In their paper Wilson JF et al (2001) identified a six-marker haplotype that they called the Atlantic Modal Haplotype (AMH). They found the AMH to be representative of approximately 90% of the R1b in Ireland. With the collection of thousands of R1b haplotypes in genetic genealogy databases, it has been possible to identify the modal values on many more markers for the AMH haplotype. For example, the modal values on the first 25 markers commonly offered by several testing laboratories have been determined and are posted on Ysearch within the ID C7BED and shown in Table 1.

In April 2006 Kenneth Nordtvedt noted (Nordtvedt, 2006) that a variety of Irish R1b existed that matched the AMH except for the unusual features,

DYS459=8,9
DYS464=13,13,15,17
DYS439=11

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Table 1
Atlantic Modal Haplotype. The markers in bold were not studied in McEvoy (2008)

Marker	Repeat Count
DYS393	13
DYS390	24
DYS19	14
DYS391	11
DYS385	11, 14
DYS426	12
DYS388	12
DYS439	12
DYS389i	13
DYS392	13
DYS389ii	29
DYS458	17
DYS459	9, 10
DYS455	11
DYS454	11
DYS447	25
DYS437	15
DYS448	19
DYS449	29
DYS464	15, 15, 17, 17

This Irish haplotype differed from the AMH modal values shown in Table 1 on these seven markers. A summary of Nordtvedt's original suggestions and subsequent developments by others has been provided by Desmond (2008).

Building on Nordtvedt's findings, a search for R1b haplotypes was undertaken in two public databases, Ysearch and Sorenson Molecular Genealogy Foundation (SMGF).

A third public database, www.ancestry.com, was considered for searching, however, as the origin of the earliest known ancestor is not recorded, this database was not useful in the current study.

Since a minimum of eight markers are need for searches in these databases, the values Nordtvedt had identified were used, together with DYS388 as this marker has been found to generally have the value of 12 for R1b. The search criteria are shown in Table 2:

Table 2
Search Criteria Used for this Study

Marker	Repeat Count
DYS388	12
DYS439	11
DYS459	8,9
DYS464	13,13,15,17

A group of 105 haplotypes were found that fully matched all seven distinctive marker values, and 191 haplotypes in total were found to belong to the cluster, defined as being within a genetic distance of two (GD=2) on these seven markers and up to GD=5 from the AMH on the balance of the 25 markers. Records that occurred in more than one database were only counted once. The process of selecting the 191 haplotypes, and the haplotypes themselves, is shown in the Supplemental Data File.

Ysearch allows the results of 96 Y-STR markers to be recorded and many of the haplotypes identified by the search criteria for DYS459, DYS464 and DYS439, have tested to 37, 67 and up to the maximum of 96 markers. When the modal values were calculated for each marker tested for the 191 haplotypes in the study and compared to the AMH modal values, several additional markers were found to be distinctive for this cluster. These are shown in Table 3.

Table 3
Markers that Distinguish the Irish Type III Cluster

Marker	AMH Values	Irish Type III Cluster Values
DYS439	12	11
DYS459	9, 10	8, 9
DYS464	15, 15, 17, 17	13, 13, 15, 17
DYS456	16	15
DYS463	22	23
DYS557	16	15
DYS494	10	9
DYS533	12	13
DYS636	11	12
DYS714	26	25
DYS716	26	24

This cluster is being called “*Irish Type III*” by genetic genealogy researchers as two other clusters have previously been identified, the NWIrish or *Uí Néill*, Ysearch ID M5UKQ and South Irish, Ysearch ID XREMB.

A Ysearch record for the modal values of *Irish Type III*, with ID NT4BZ, has been established to facilitate meaningful searches for cluster haplotypes.

Geographical Origins of the Cluster

Analysis showed 54% of our sample knew the country of origin of their ancestor in Europe, and 75% of these gave their origin as Ireland, 13% Scotland and 11% England. See Table 4 and Figure 1. Many of those who only knew of colonial origins for their earliest known ancestor, have Irish names, giving further confirmation of the Irish origin of the members of this cluster.

Table 4
Country of Origin for Ancestors of Members of Irish Type III Cluster

Country	Number
Ireland	78
Scotland	13
England	11
Europe	2

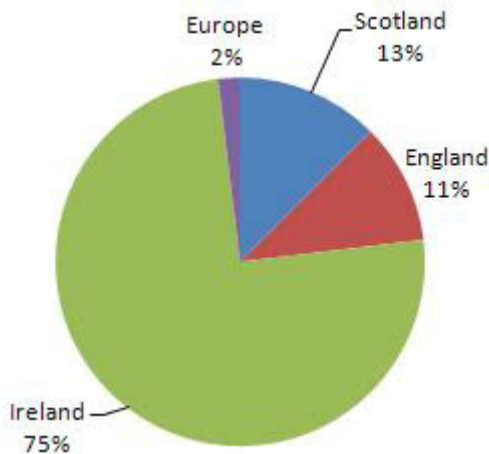


Figure 1. Origins of known ancestors in Europe

Of those who gave their origin as Ireland and where their county of origin was known, 26% identified Co. Clare, 23% Co. Tipperary, and 16% Co. Limerick, a total of 65%, as shown in Table 5 and Figures 2 and 3. These Northern Counties of Munster have historically been known as “Thomond.” The principal clan of Thomond was the *Dál gCais* of which O’Brien is the principal family.

Table 5
Irish Counties Where Ancestral Lines are Known to have Originated

County	Number
Clare	11
Tipperary	10
Limerick	7
Cork	6
Northern Ireland	2
Donegal	2
Waterford	1
Dublin	1
Laois	1
Kerry	1
Mayo	1
Ireland Co Unknown	35
Ireland Total	78

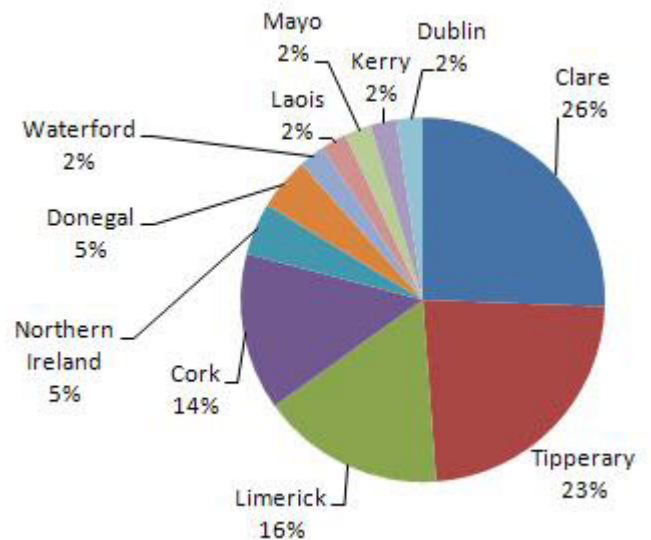


Figure 2. Origins of known ancestors in Ireland

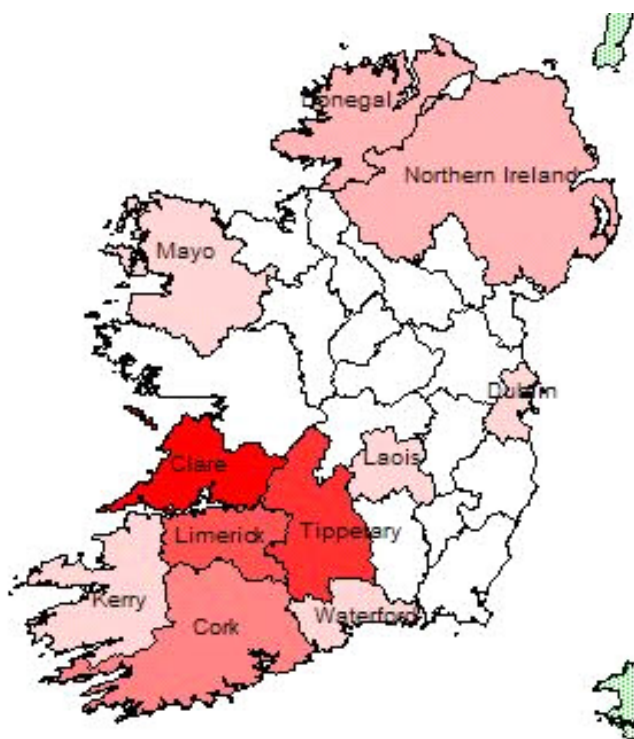


Figure 3. Location of the earliest known ancestors is concentrated in Munster

The O'Briens take their name from Brian Boru, High King of Ireland, CE 926-1014, and the family were Kings, Princes and Earls of Thomond until the 18th century.

Origin of the Dalcassian and Related Surnames

The history and pedigree of the *Dál gCais* and their descent from Cas, born CE 347, sixth in descent from Cormac Cas, son of Oilioll Olum, King of Munster, is detailed in *Irish Pedigrees or the Origin and Stem of the Irish Nation*, (O'Hart, 1892). O'Hart further states that in following generations, as surnames were adopted, many families are patrinely linked to this line and he identifies the following families as Dalcassian:

MacArthur, O'Beollan (or "Boland"), O'Brien, O'Brennan, O'Casey, MacConsidine, O'Cormacan, Cosgrave, MacCraith, (or MacGrath), O'Curry, Eustace, Glinn, Glynn, Hearne, O'Hogan, O'Hurley, O'Kelleher, O'Kennedy, Magan, Maglin, MacMahon, O'Meara, Muldowney (now "Downey"), O'Noonan, Power, Quirk, O'Regan, Scanlan, O'Seasnain, and Twomey.

Figure 4 shows the connections of the Dalcassian families listed above to the O'Brien line. If the pedigrees

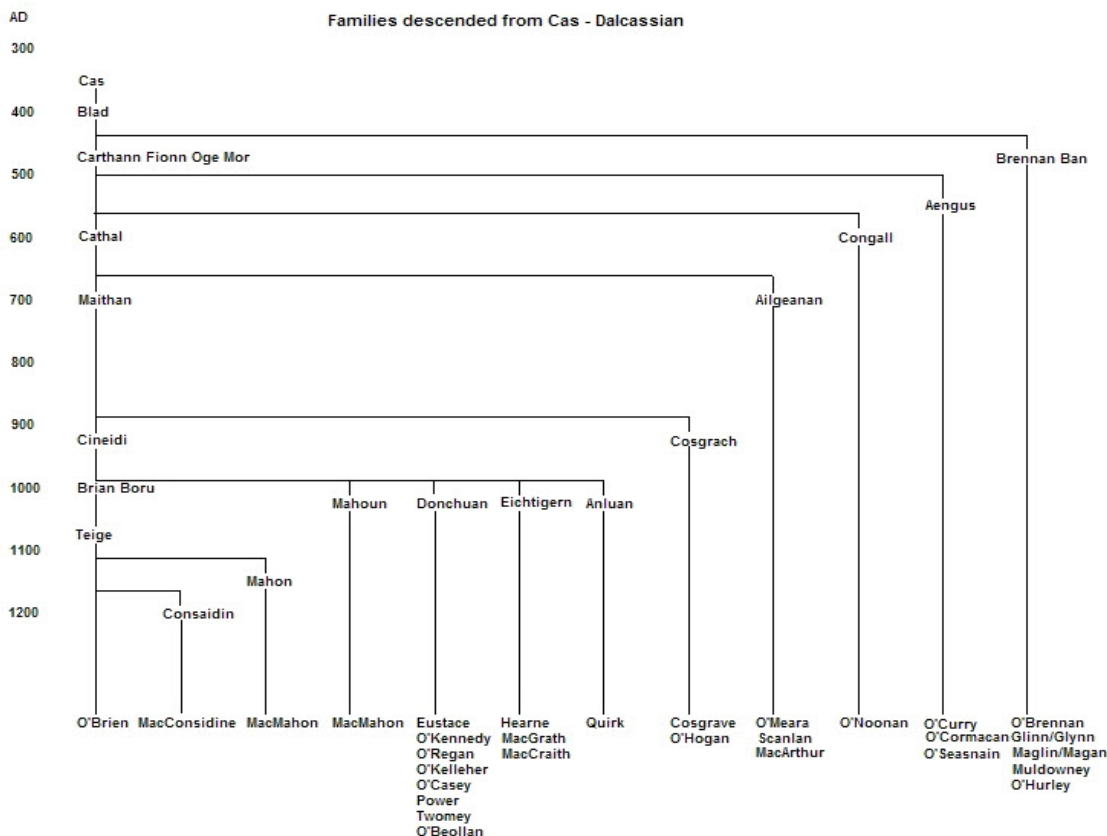


Figure 4. Families descended from Cormac Cas, hence Dalcassian surnames in the Irish Type III Cluster

are correct, then the same Y-STR signature should be evident in each of these families.

The surnames that occur more than once in our sample of 191 haplotypes are shown in Table 6.

Table 6
Surnames Found in the Irish Type III Cluster

Surname	Count
O'Brien/Bryan/Bryant	24
Casey	12
McCraw/McGraw/McGrath	10
Butler	10
Crow(e)	5
Hogan	5
Kennedy/Canady	5
Hart	4
Cannon	3
Kelly	3
Lynch	3
MacNamara	3
Maloney/Moloney	3
Welch	3
Wright	3
Bresnan	2
Corbett	2
Forbes	2
Johnson	2
McConnell	2
O'Halloran	2
Ryan	2
West	2

MacLysaght (1985) says of some of the families that are not included in Figure 4:

Bryan and Bryant are variations of O'Brien, descended from Brian Boru.

O'Casey: The name of six unrelated septs. It is chiefly found now in the south-west of Munster. One sept was Dalcassian and was seated at Liscannon near Bluff in Co. Limerick.

McGrath: hereditary poets to the O'Briens.

Crow(e): MacEnchroe, all Crowes in their homeland, Thomond, are of native Irish stock, from Clare and Tipperary.

Hogan: descended from Ógan, an uncle of Brian Boru.

O'Hart: is from Derry, but O'Hartigan is from the same Christian name, 'Art'. This sept is Dalcassian, located in East Clare and North Limerick.

Kennedy: Thomond Kennedys are descended from Cinnéad, a nephew of Brian Boru.

MacNamara: hereditary marshals to the O'Briens.

The more frequently occurring surnames in Table 6 are either Dalcassian, as defined by O'Hart (1892), or have a strong connection with Thomond, such as Butler.

Murrough (Morgan) O'Brien of Ballyphillip, Co. Limerick married Eleanor Butler, daughter of Capt Edward Butler of Bansha, descendant of Thomas Butler, 10th Earl of Ormonde. As was often the case, Morgan O'Brien took Butler as his surname, probably as part of his and his wife's succession to the lands of Bansha, Co Tipperary in 1690.

This may be the link whereby many of the name Butler have *Irish Type III* haplotypes, but Butler was considered non-Dalcassian in the present study.

Dalcassian Surname Representation in Irish Type III

29% of the 191 haplotypes in the present study belonged to Dalcassian surnames. The Ysearch database was searched to see what proportion of each surname found in the study cluster was *Irish Type III*. Only those records that recorded DYS459 and DYS464 were analysed. For each surname in Figure 4, the percentage in Ysearch that were Irish Type III was calculated and the results are shown in Table 7. Similarly, Ysearch was searched for the non-Dalcassian surnames that were found in our study sample, and the percentage in Ysearch that were Dalcassian was recorded for each of these surnames as shown in Table 8. Non-Dalcassian surnames with less than three occurrences in our study sample were not considered in this analysis.

Some surnames, including O'Brien and Casey, occur in more than one county (MacLysaght, 1985), so septs with origins outside Thomond may well have different Y-STR signatures from the *Dál gCais*.

It was also common for followers of Medieval leaders to take their clan leader's name to show their allegiance

Table 7
Dalcassian Surnames

Surname	Total	Irish III	%
MacArthur	3	-	-
O'Beollan /Boland	2	-	-
O'Brien/Bryan(t)	68	24	35
O'Brennan	9	-	-
O'Casey	20	12	60
MacConsidine	-	-	-
O'Cormacan	-	-	-
Cosgrave	-	-	-
McGraw/McGrath	21	10	48
O'Curry	16	-	-
Eustace	1	-	-
Glinn/Glynn/Glenn	7	-	-
Hearne	-	-	-
O'Hogan	15	5	33
O'Hurley	7	-	-
O'Kelleher	1	-	-
O'Kennedy	44	5	11
Magan/Maglin	-	-	-
MacMahon	6	-	-
O'Meara	-	-	-
Muldowney/Downey	2	-	-
O'Noonan	1	1	100
Power	45	-	-
Quirk	-	-	-
O'Regan	2	-	-
Scanlan	1	-	-
O'Seasnain	-	-	-
Twomey	-	-	-
Total	271	57	21%
Total for Four Surnames Shown in Bold	124	51	41%

and so the Y-STR signature of their descendants may well not match that of their leader. These acts of allegiance occurred both before and after the use of surnames were adopted. For these reasons, many with Dalcassian surnames do not have the Irish Type III Y-DNA signature.

Surnames with the greatest representation in the cluster and with the highest percentage of the *Irish Type III* signature are the traditional Dalcassian surnames of O'Brien/Bryant, O'Casey, McGraw/ McGraw/McGrath and O'Hogan. These four surnames are shown in bold in Table 7.

Table 8
Non-Dalcassian Surnames

Surname	Total	Irish III	%
Butler	90	10	11
Crow(e)	53	5	9.4
Hart	45	4	8.9
Lynch	9	3	33
Kelly	51	3	5.9
Macnamara	4	3	75
Maloney/Moloney	14	3	21
Welch	10	3	30
Wright	95	3	3.2
Total	371	37	10%

Many allegedly Dalcassian families are not present in this cluster, but many such families have no members with records in Ysearch.

Non-Dalcassian Surnames Irish Type III

There are many non-Dalcassian surnames found in small numbers in the study sample. Some may have resulted from ancient tribal allegiances and marriages where the male takes the female's family name, as in the case of Butler and probably also MacNamara. Adoptions and out-of-wedlock situations will undoubtedly have also contributed to this situation. When considered as a percentage of the total entries of that name in Ysearch, other than those that have a connection with the *Dál gCais* as detailed above, non-Dalcassian surnames are invariably a minor contribution. See Table 8.

Single Nucleotide Polymorphisms

Members of the Y-STR haplotype cluster, *Uí Néill*, are found to be derived for the SNP, M222. No SNP has yet been discovered that uniquely defines the *Irish Type III* cluster. SNP testing of members of this cluster has shown the cluster to be derived for the SNPs, S116/P312 and L21/S145, with all SNPs below L21/S145 being found ancestral. These results are shown on the *Irish Type III* website – SNP markers. This cluster exists within the R1b1b2a1a2f* (R-L21*) sub-clade (ISOGG, 2009).

Conclusion

An R1b cluster with a distinctive Y-STR modal haplotype has been identified, which is commonly referred to as "*Irish Type III*" by genetic genealogy researchers. It is shown in Ysearch as ID NT4BZ.

This modal haplotype is shown to have its origins in the counties of Clare, Limerick and Tipperary, the hereditary lands of the *Dál gCais* and their principal family, the O'Brien. The Y-STR signature of the cluster is found in many descendants of the *Dál gCais* sept including, O'Brien and its variations Bryan and Bryant, Casey, Hogan, Kennedy, and McGrath.

A set of distinctive marker values has been shown to exist that defines the Y-DNA STR Signature for Gaelic Dalcassian Families.

Supplementary Information

The haplotypes used in this study are available in a supplementary data file at:

<http://www.jogg.info/51/wright.xls>.

Acknowledgments

Thanks are extended to Dr. Kenneth Nordtvedt who identified the initial markers for this R1b cluster in April 2006 and pointed to its concentration in Ireland.

The availability of the Ysearch and SMGF databases were invaluable in enabling this cluster to be studied.

Web Resources

Irish Type III website – SNP markers

<http://www.irishtype3dna.org/SNPMarkers.htm>

ISOGG 2007 Y phylogenetic tree, R sub-page

http://www.isogg.org/tree/ISOGG_HapgrpR07.html

ISOGG 2009 Y phylogenetic tree, R sub-page

http://www.isogg.org/tree/ISOGG_HapgrpR09.html

Sorenson Molecular Genealogy Foundation Database

<http://www.smgf.org>

Ysearch database (2008)

<http://www.ysearch.org>

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