

Insights Into the O'Neills of Ireland from DNA Testing

Edwin B. O'Neill and John D. McLaughlin

The O'Neills of Ireland are one of the best known and important families in Irish history, descended from a long dynastic line that for centuries were Kings of Ulster and High Kings of Ireland. By traditional pedigree they are patrilineal descendants of Niall "of the Nine Hostages" who was the semi-historical High King of Ireland who died in 405 and who was the founder of the famous Ui Neill dynasty. But an examination of DNA data on males with the O'Neill, McLaughlin, O Cathain, McShane and other related surnames has led to a theory that the Royal Tyrone O'Neills of Ireland, from some point forward, were not, as history records, patrilineal descendents from the line of the Ui Neill. An analysis of available Y-DNA data on 102 males with the O'Neill surname reveals the existence of two different O'Neill Y-STR clusters, both primarily located in the region of Ireland associated with the Ui Neill line and the Royal O'Neills. Results of testing the Y-SNP M222 indicate that the two groups of O'Neills are distinctly separate. Documented Irish history, coupled with Y-DNA data on surnames linked to the Ui Neill line at different time periods (McLaughlin, O Cathain and McShane) suggest the approximate time frame of a non-paternal event (NPE) in the Royal O'Neill line occurred between the 900s and 1500s.

Introduction

The purpose of the present research was to determine if available DNA and other data provide new insights into the O'Neills¹ of Ireland, including the relationship of the O'Neills to Niall "of the Nine Hostages," the traditional founder of the Ui Neill dynasties in Ireland.

Irish Historical Background

One of the most important surnames in Irish history is O'Neill; persons bearing that surname were kings or rulers in Ireland for most of the period from 956 to the early 1600s. According to history/legend/myth, the O'Neills are patrilineal descendants of Niall Noigiallach (Niall "of the Nine Hostages," herein referred to as N9H), King of Ireland 380-405 and the founder of the Ui Neill dynasty. Over the years the Ui Neill line separated into the Northern Ui Neill group, centered in the province of Ulster, and the Southern Ui Neill group, centered in the province of Leinster. By history/legend/myth Niall was also ancestor to persons bearing numerous other Irish surnames, including O'Donnell, Bradley, O'Gallagher, O'Doherty, Flynn, McLaughlin, Byrne, etc.

address for correspondence: E. B. O'Neill,
vix3205@cox.net

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¹ The surname O'Neill used in this paper includes all alternate spellings (e.g. O'Neill, O'Neil, O'Neal, etc.).

Trinity College, Dublin (TCD) Studies

Y-DNA testing can help separate Irish history from legend and myth as in a study series conducted by Trinity College, Dublin (TCD). In their first study (Moore 2006 and Suppl), 796 males (no surnames identified) from all areas of Ireland were tested for selected SNPs and 17 Y-STR markers, revealing the existence of a unique cluster of haplotypes, the modal values of which they labeled as Irish Modal Haplotype (IMH). The IMH, along with a one-mutational-step which TCD called IMH+1 (one-step difference up-or-down at one marker from IMH), accounted for 8.2% of the island's sample of 796 males. A much higher percentage of IMH was found in northwest Ireland. Of the 796 participants, 85.4% belonged to the R1b3 haplogroup (R1b-M269, currently called R1b1c, see ISOGG, 2006).

To examine further the question of whether the IMH was consistent with patrilineal descent from the Ui Neill line, Moore et al. (2006) tested another 59 participants, all with surnames linked to the Ui Neill line (but not including O'Neills), at 19 Y-STR markers, the results showing ". . . a significantly higher affinity with the IMH . . . than with a general R1b3 northwestern Ireland geographic population . . ."

Independent of, and prior to the TCD studies, Wilson (2006) identified what he named the NWIrish Variety Modal Haplotype with a higher percentage occurrence in northwest Ireland. At markers TCD tested (fewer than were included in the NWIrish modal haplotype) modal values are the same as NWIrish. IMH is possibly a smaller and more-recent subset of NW Irish. TCD estimated the IMH Time to the Most Recent Common Ancestor (TMRCA) as about 1,730 years ago while

others believe the NWIrish line is 3,000 to 5,000 years old. For example, the estimate by McEwen (2006) is 3,362 years. For the remainder of this article, the modal haplotype for all IMH and NWIrish haplotypes will be referred to as the Northwest Irish Modal Haplotype (NWIMH) and haplotypes that cluster around the NWIMH will be referred to as the Northwest Irish Variety (NWI).

Through 19-Marker Y-STR tests a second TCD study by McEvoy and Bradley (2006) (data, shown at McEvoy (2006)), examined 1,325 males of selected surnames including 80 O'Neills from all areas of Ireland. Other than their surname and location in Ireland, the O'Neill participants were anonymous.

Methods

The present study used the Y-STR data on the 80 O'Neills identified in the TCD surname study, supplemented with data from six additional DNA sources on O'Neills (and McLaughlins, O Cathains, McShanes and others). These sources were, the Y-STR database of Sorenson Molecular Genealogy Foundation (SMGF), Y-Base, Y-Search, the surname projects of Family Tree DNA (FTDNA), the Clan McShane-Johnson-MacSeai'n (McS) website and a separate McShane Family website.

SMGF has an extensive collection of haplotypes from samples donated for research purposes with online access and a surname-search capability. The Y-Search and Y-Base databases also allow for searches by surname. The FTDNA projects provide Y-DNA test results for specific participants, many of whom have also uploaded their results to Y-Search; these participants are identified by kit number. McS includes Y-DNA test results for several McShane, O'Neill and related surnames while The McShane Family website shows results for several McShanes. Y-STR haplotypes for 22 O'Neills were extracted from the six sources, which were then added to the 80 haplotypes from the TCD study, resulting in an overall total of 102.

Results

A most important finding was the presence of at least two distinct clusters within the 102 haplotypes, one associated with NWI, the other not. We have named the second cluster the O'Neill Variety (ON) and the modal haplotype for this cluster, the O'Neill Modal Haplotype (ONMH). Restricting the clusters to those haplotypes which are one-step up-or-down at two markers or less from NWIMH or ONMH there are twelve O'Neills in the NWI group but more than twice as many, 30 haplotypes, in the ON cluster. The remaining 62 O'Neills were apparently unrelated to the

two largest clusters, representing multiple independent origins of the surname.

Table 1 displays those 12 O'Neills who form the NWI cluster. The authors have arbitrarily included in this table only those haplotypes within two mutational steps of the modal values, but a later table will include haplotypes of more mutational steps, but confined to territories associated with the Northern Ui Neill and the Tyrone O'Neills (O'Neills from in and around County Tyrone). Because the great majority of subjects was from the McEvoy and Bradley TCD study, the table displays only the 19 markers used in that study. More markers were available for the non-TCD-study participants, but those are omitted in **Table 1**. The TCD study tested a few markers not available in the other sources, so, where appropriate, some values are left blank in the table. "ON-X" denotes a participant from the TCD study, "O-N29907" and "O-49120" are from the FTDNA O'Neill Project, showing their kit numbers, and "N-2274" is from the FTDNA Neal-O'Neal Project, also labeled by kit number. It is noted that 2 has been added to the DYS values of the TCD study for DYS 461 to make it compatible with conventions used by FTDNA, DNAH, DNA-FP, etc. Y-Search, Y-Base, SMGF and the two McShane sources did not yield any additional O'Neills beyond those included in Table 1.

Table 2 shows the Y-STR haplotypes for the 30 O'Neills of the O'Neill Variety. Of the 30, 13 had identical 19/19 matches, 2 had 16/16 matches, 10 had 18/19 matches, 1 had 15/16, 2 had 11/12 and 2 had 17/19. The table illustrates that this ON Variety is a very tightly clustered group, indicative of a very recent origin. Expanding the restrictions to 3 mismatches, yields only two more O'Neills. It is noted that, using only their 80 O'Neills and haplotypes within one mutational step or less of ONMH, McEvoy and Bradley estimated the TMRCA of about 1,100 years (about the year 900), very close to the time frame of the grandson of Niall Glundubh, Domhnall "of Armagh", said to be the first to use the surname O'Neill. It is also noted that, in the TCD surname study, there were only two non-O'Neills closer than a 16/19 match with ONMH (McNeice and McVeigh).

In **Table 2** O'N¹³ designates thirteen O'Neills from the TCD study (ON2, ON3, ON11, ON16, ON24, ON25, ON39, ON41, ON43, ON53, ON61, ON65, and ON71), all with haplotypes identical to the ONMH; other ON's identify other TCD O'Neills; "SX" designates a SMGF participant, "O-X", a FTDNA O'Neill Surname Project participant with his kit number, and McS-1 an O'Neill listed at the McS site. Note: one repeat has been added to DYS 461 on all the SMGF haplotypes for compatibility with current standards.

Table 1 O'Neills with NWIrish Variety Haplotypes

DYS	1 9	3 8 8	3 9 0	3 9 1	3 9 2	3 9 3	4 3 4	4 3 5	4 3 6	4 3 7	4 3 8	4 3 9	3 8 9- 1	3 8 9- 2	4 6 0	4 6 1	4 6 2	3 8 5 a	3 8 5 b
NWIMH	14	12	25	11	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13
ON62	14	12	25	11	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13
ON31	14	12	25	11	14	13	9	11	12	15	11	12	13	29	11	12	11	11	13
ON68	14	12	25	10	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13
ON76	14	12	25	10	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13
ON1	14	12	25	11	14	13	9	11	12	14	12	12	13	29	11	12	11	11	13
O-N29907	14	12	25	11	14	12						12	13	29				11	13
ON57	14	12	25	11	14	13	9	11	12	15	12	13	13	29	11	12	11	11	14
ON44	15	12	25	12	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13
ON22	14	12	25	11	14	13	9	11	12	15	12	12	11	13	29	11	11	11	13
ON19	14	12	25	11	14	13	9	11	12	15	12	11	13	29	11	11	11	11	13
O-49130	14	12	25	11	13	13				15	12	12	13	29	11			11	14
N-2274	15	12	25	12	14	13						12	13	29				11	13

Table 2 O'Neills with O'Neill Variety Haplotypes

	1 9	3 8 8	3 9 0	3 9 1	3 9 2	3 9 3	4 3 4	4 3 5	4 3 6	4 3 7	4 3 8	4 3 9	3 8 9- 1	3 8 9- 2	4 6 0	4 6 1	4 6 2	3 8 5 a	3 8 5 b
ONMH	14	12	24	11	13	13	9	12	12	15	12	11	13	30	11	12	11	12	15
O'N ¹³	14	12	24	11	13	13	9	12	12	15	12	11	13	30	11	12	11	12	15
S1	14	12	24	11	13	13				15	12	11	13	30	11	12	11	12	15
S5	14	12	24	11	13	13				15	12	11	13	30	11	12	11	12	15
ON5	14	12	24	11	13	13	9	11	12	15	12	11	13	30	11	12	11	12	15
ON29	14	12	24	11	13	13	9	11	12	15	12	11	13	30	11	12	11	12	15
ON30	14	12	24	10	13	13	9	12	12	15	12	11	13	30	11	12	11	12	15
ON38	14	12	24	10	13	13	9	12	12	15	12	11	13	30	11	12	11	12	15
ON27	14	12	24	11	13	13	9	12	12	15	12	12	13	30	11	12	11	12	15
ON32	14	12	24	11	13	13	9	12	12	15	12	11	13	29	11	12	11	12	15
ON35	14	12	24	11	13	13	9	12	12	15	12	11	13	30	10	12	11	12	15
ON80	14	12	24	11	13	13	9	12	12	15	12	11	13	30	11	13	11	12	15
O-36315	14	12	24	11	13	13	9	12	12	15	12	11	13	30	11	12	11	11	15
McS-1	14	12	24	11	13	13				15		11	13	30				11	15
O-42891	14	12	24	11	13	13				15		11	13	30				11	15
ON21	14	12	24	11	13	13	9	12	12	15	12	11	13	30	11	12	11	12	16
S2	14	12	24	11	13	13				15	12	12	13	30	11	12	11	11	15
ON59	14	12	24	11	13	13	9	11	12	15	12	11	13	30	11	12	11	13	15
ON60	14	12	24	11	13	13	9	12	12	15	12	11	13	29	12	12	11	12	15

It is important to examine the frequency of occurrence of these two clusters of O'Neills in those areas associated with the Royal O'Neills (Tyrone O'Neills) and the Northern Ui Neill, those situated in the north and west of Ireland in the present counties of Tyrone, Armagh and Antrim and those where natural migration

might have been expected (Counties Derry, Monaghan and Donegal). It is noted there were also unrelated septs of O'Neills located in Thomond (Counties Clare, North Limerick and North Tipperary), Co. Carlow, and the Decies (Counties Waterford and South Tipperary) (MacLysaght, 1985).

Nearly all of the O'Neill study sample subjects who were not in the TCD study were unable to identify the province or county of origin in Ireland, so they are excluded from what follows. The 80 TCD O'Neill subjects were from: Ulster (30), Munster (17), Leinster (11), Connaught (6), Unknown Ireland (7) and Outside Ireland (9), where the province listed was the domicile of the paternal grandfather of the participant. **Table 3** shows the provinces and counties of origin for these subjects.

Examining only R1b and those O'Neills identified by TCD as being from the territory of the Tyrone O'Neills results in 27 O'Neills. Because NWI is an older cluster, it is difficult to determine with Y-DNA alone which of the O'Neills are actually related to NWI. **Table 4** identifies the percentage of those 27 in the TCD study which are in the NWI and ON clusters, depending on how many mutational steps are allowed in each cluster.

Table 4 shows that, for entries from Tyrone O'Neill territory, NWI and ON together represent a large percentage of O'Neills in the area.

Table 5 compares the ONMH and the NWIMH, showing differences at 7 of 19 markers.

Using all 102 O'Neills and markers beyond those used by TCD it is possible to propose an expanded ONMH and to compare it to the NWIMH. Such an expansion is shown in **Table 6**, but it is only preliminary because of the small database.

Other Surnames Linked to NWIrish

According to the traditional pedigrees and mythology of Ireland most of the septs in the northwest of Ireland descend from either Niall of the Nine Hostages (N9H) or one of his two brothers, Brian (or Brion) and Fiachrach. Descendants of Brian and Fiachrach are referred to as "Connachta," or descendants of Conn "of the Hundred Battles", an earlier ancestor of Niall. The descendants of Niall in the northwest, according to these traditions, are mainly Cenel Conaill or Cenel Eoghain, meaning descended from Conal gulban or Eoghain, sons of Niall.

Table 3 Distribution of TCD O'Neill and NWIrish Varieties in Ireland

Province/County	Total	ON	NWI
1. Ulster			
Tyrone	14	7	2
Derry	3	3	0
Armagh	3	1	0
Antrim	3	0	0
Donegal	2	1	0
Monaghan	2	0	2
Down	2	0	0
Other	1	0	0
Total Ulster	30	12	4
2. Leinster			
Dublin	5	2	1
Carlow	1	0	0
Kilkenny	3	0	0
Laois	1	0	0
Wicklow	1	0	0
Total Leinster	11	2	1
3. Munster			
Clare	2	1	0
Cork	6	1	0
Kerry	1	0	0
Limerick	6	1	0
Tipperary	1	0	0
Waterford	1	0	0
Total Munster	17	3	0
4. Connaught			
Mayo	3	1	0
Sligo	3	1	0
Total Connaught	6	2	0
5. "Ireland"			
	7	2	1
6. Outside Ireland			
	9	3	0

Table 4 Percentage of NWIrish and O'Neill Varieties with Different Mutational Steps from the Modal Haplotype

Mutational Steps	0	1	2	3	3+ **
NWI	3.7%	3.7%	14.8%	25.9%	29.6%
ON	25.9%	40.7%	44.4%	48.1%	48.1%

** Includes some two-mutational steps at the same marker

Table 5 ONMH and NWIMH Comparisons

DYS	1 9	3 8 8	3 9 0	3 9 1	3 9 2	3 9 3	4 3 4	4 3 5	4 3 6	4 3 7	4 3 8	3 8 9	3 8 9	4 8 9	4 6 0	4 6 1	4 6 2	3 8 5	3 8 5
ONMH	14	12	24	11	13	13	9	12	15	12	11	13	30	11	12	11	11	12	15
NWIMH	14	12	25	11	14	13	9	11	12	15	12	12	13	29	11	12	11	11	13

Table 6 Comparison of NWIMH and Expanded ONMH

DYS	NWIMH	ONMH	DYS	NWIMH	ONMH	DYS	NWIMH	ONMH
19	14	14	441	13		462	11	11
385a	11	12	442	12	13	463	22	
385b	13	15	444	12		464a	15	15
388	12	12	445	12		464b	16	15
389-1	13	13	446	13		464c	16	17
389-2	29	30	447	25	25	464d	17	17
390	25	24	448	18	19	570	17	
391	11	11	449	30		576	18	
392	14	13	452	11		607	16	
393	13	13	454	11	11	IB07	10	
425	12		455	11	11	A10	13	
426	12	12	456	17	15	C4	23	
434	9	9	458	17	17	CDYa	37	
435	11	12	459a	9	9	CDYb	39	
436	12	12	459b	10	10	GATAH 4	11	11
437	15	15	460	11	11	YCAiia	19	19
438	12	12	461	12	12	YCAiib	23	23
439	12	11						

The Trinity College team listed the following surnames as having haplotypes (with number) matching the NWIrish Variety:

(O')Gallagher (12), (O')Boyle (9), (O')Doherty (5), O'Donnell (4), O'Connor (3), Cannon (3), Bradley (2), O'Reilly (2), Flynn (2), (Mc)Kee (2), Campbell (1), Devlin (1), Donnelly (1), Egan (1), Gormley (1), Hynes (1), McCaul (1), McGovern (1), McLoughlin (1), McManus (1), McMEnamin (1), Molloy (1), O'Kane (1), O'Rourke (1), and Quinn (1).

STR analysis (data not shown) of the same surnames in public databases such as Y-Search confirm that at least some participants in each surname project match the NWI.

These surnames can be divided into clan names, following Irish traditions, as follows:

Cenel Conaill: O'Gallagher, O'Boyle, O'Doherty, O'Donnell, Cannon, McMEnamin.

Cenel Eoghain: Bradley, Devlin, Donnelly, Gormley, McCaul, Campbell, McLaughlin, O'Kane, Quinn.

Ui Briuin: O'Connor, O'Reilly, Hynes, Flynn, McGovern, McManus, O'Rourke

No surnames of the Clan Ui Fiachrach were mentioned by the Trinity team, but several haplotypes of surnames of that clan were found in the Y-Search database that match the NWI: O'Dowd, O'Shaunnessy.

In addition to the Irish matches, a large number of people with Scottish surnames also match the NWI, as do a lesser number of English surnames. There are also many surname matches in Ireland itself that cannot be assigned a definite clan affiliation, a good number of which were probably late Plantation Period stock of the 17th century, when English and Scottish adventurers were granted huge tracts of land in northern Ireland after the failed rebellion of Sir Cahir O'Doherty in 1609. These new landowners in Ireland imported settlers from lowland Scotland and England in huge numbers in an attempt to pacify the countryside.

In short, for every surname that the Irish pedigrees would lead us to believe were descended from N9H or his brothers, including O'Neill, there are participants who closely match the NWI.

Another branch of the Ui Neill were the southern Ui Neill, centered in the midland counties, and descended from yet other sons of Niall. But these are as yet poorly represented in DNA databases.

Impact of M222 SNP Results on Data Interpretation

A recent observation by McEwen (2006) is that all males with STR values associated with NWIrish who have been tested on the SNP M222 have tested positive.² This group includes a number of known Ui Neill surnames: a Gallagher from County Derry (Cenel Conaill), a Cannon of unknown origin (a Cenel Conaill

² McEwen calls his cluster R1bSTR19Irish which he says is essentially the same as NWI

surname; the O Canannans were Kings of Tirconnell prior to the O'Donnells), a Slaven from Tyrone (Cenel Eoghain) and a Burns from Sligo (Ui Briuin) all have tested M222+. Several other surnames with less definite Ui Neill clan affiliations have also tested M222+, including a Flannagan from Tyrone (possibly Cenel Cairbe mac Neill), a Bonner from Donegal and a Magonegill (both probably Cenel Conaill). The Magonegill listing states only an "origin in Ireland" but McGonagle (a variant form) is a common Donegal surname, almost unique to the northwest of Ireland. Bryson, another Donegal surname, is said to be the anglicized form of O Muirghesain (Cenel Eoghain). A Gormley of unknown origin could be either O Goirmleadaigh (Cenel Eoghain) or O Gormghaile in Connacht, both of Ui Neill origin. A Donohoe from Cavan is probably Ui Briuin. McNickle (Mac Nicholl) is yet another surname from Ui Neill territory (Tyrone). All of these latter have also tested M222+.

If these results are reinforced as more persons are tested, it would imply that M222+ is a necessary, though perhaps not sufficient condition, to be part of the NWI grouping and, perhaps, associated with the Ui Neill. To date one of the authors of this paper (shown in **Table 2** as O-36315, and identified as SKX6A in Y-Search) is the only person known to be associated with the ONMH to have been tested on M222 and he tested negative for M222. Though this is a single data point, it suggests, along with STR data, that the ON Variety is not part of the NWI. Further, it suggests that people with the ONMH are not patrilineally descended from Niall of the Nine Hostages.

Timeline for Analysis

The timeline from Niall of the Nine Hostages forward, as per history/legend/myth is:

- 380-405: Niall of the Nine Hostages (N9H), 127th King of Ireland
- 380-980: Almost all of the surnames historically linked to N9H or his brothers, branched off from the genetic line of the Tyrone O'Neills:

718: Fergal Mac Maele Duin, King of Ireland died. He was the Most Recent Common Ancestor (MRCA) of O Cathains and Tyrone O'Neills,

862-875: Either Aedh Finnliath, King of Ireland, was the MRCA of McLaughlins (MacLochlainns) and Tyrone O'Neills, or

956-980: Domhnall Ardmacha Ua Niall (O'Neill), King of Ireland, was the MRCA of McLaughlins (MacLochlainns) and Tyrone

O'Neills. Domhnall, grandson of Niall Glundubh, 170th King of Ireland, was said to be the first to use O'Neill as a surname

- 1004-1030 and 1033-1036: Flaithbertach an Trostain O'Neill, King of Ailech
- 1176-1177: Aedh Macaemh Toinleasg O'Neill ("Lazy Youth"), King of Cenel Eoghain, was the MRCA of Tyrone and Clannaboy O'Neills
- 1432-1455: Eoghan O'Neill, King of Ulster, was the MRCA of Tyrone and Fews O'Neills
- 1519-1542: Conn Bacach O'Neill, King of Tir Eoghain and, 1542-1559, 1st Earl of Tyrone, probable MRCA of O'Neills and McShanes

As shown, almost all surnames historically linked patrilineally to N9H or his brothers are from lines branching off from the N9H line somewhere after N9H (circa 380) and before Domhnall Armacha O'Neill (died 980). The O'Neill (Ua Neill) surname was first introduced circa 950.

The patrilineal line of O'Neills is well established from 1176 to the present time but between 1036 and 1176 the historical accuracy of the O'Neill pedigree has been questioned by O Ceallaigh (1951, 1994). The period of 1036-1176 may therefore be a time of suspicion for O'Neill patrilineal decendancy. In 1176 Aedh Macaemh Toinleasg O'Neill reinstated O'Neill power after years of supremacy by their kinsmen the McLaughlins. About 400 years later, an O'Neill is said to have begun the surname McShane.

O Cathains and McLaughlins

The two closest kin to the O'Neills of Ireland were the O Cathains (O'Kane) and the McLaughlins of Derry/Donegal.

O Cathains

The O Cathains were descended from Conchobhar or Conor, son of Feaghal, the Irish High King (d. 718), also an O'Neill ancestor. In later centuries they were the leading sept of the Clan Conchobhar, originally located in Magh Ith on the Donegal/Tyrone border. Sometime in the middle of the 12th century they relocated to County Derry. In later centuries the O Cathains were an important sub-chieftain of the O'Neills of Ulster with branches extending into Co. Antrim. Trinity College included the O Cathains of Ulster in their list of Ui Neill matches; and entries in Ysearch for Kanes/O'Kanes in Antrim and Tyrone confirm that this sept were NWI or Ui Neill. The

McHenrys were a branch of the O Cathains of Ulster. Entries in Ysearch for McHenrys from Tyrone and Antrim also match the NWI.

McLaughlins

The McLaughlins were the closest kin to the O'Neills of all the Cenel Eoghain septs. Unfortunately the McLaughlin pedigrees are in disarray making it impossible to say exactly when they branched off from the main line of the Ui Neill. Rawlinson (c1130) has the McLaughlins descend from Muirdaigh, a son of Domhnall "of Armagh" (d. 980). A slightly later source, the Book of Leinster, has the McLaughlins descend from Domhnall (d. 980), son of Aedh Finnleith (d. 876). According to traditional pedigrees (the Books of Ballymore and Lecan, both circa 1390) the O'Neills descend from Muirchertach, a different son of Domhnall "of Armagh."

There are currently twelve McLaughlin DNA samples on Ysearch. Out of these, 9 match the NWI, including a sample from Letterkenny, Donegal and one from Tyrone. Another McLaughlin from Donegal in the Sorenson database matches the NWI, as did the one McLaughlin sample in the Trinity College study

Conclusion Based on O Cathains and McLaughlins

It appears then, based on the evidence available to date, that the main line of Ui Neill kings in Ulster were NWI at least through the 870-980 period when the McLaughlins branched off from the main line.

Discussion of McShanes

As stated above the McShane surname has been historically linked to the O'Neill line circa 1500s. Y-DNA values for eight McShanes were found at the various databases, seven of which appear to be consistent with ON as shown in Table 7. Four McShanes, two from Tyrone (McS 1 and 2) and one each from Ireland (McS 3) and Derry (McS 4) were found at two McShane websites (2006), all similar to ON. Two were found using Y-Search, with one (McS 5) identifying his most distant ancestor as being from Desertmartin, Ulster (Co. Derry), the other (McS 6) from Ireland. SMGF yielded two additional McShanes, one (McS 7), most distant ancestor in Kansas, had ON, the other not. None of the eight McShanes can be associated with NWI. For reference in **Table 7**, the ONMH, from **Table 6**, is shown in the left column.

Comments on the O'Neills of Clannaboy and Fews

The territory of the Clannaboy O'Neills, who branched off from the main Tyrone O'Neill line circa 1100s, was primarily in counties Antrim and Down, both greatly

under-represented in the TCD studies (2 samples, both in Antrim) making it impossible to draw any conclusions relative to the NWI or ON. The same is true of the O'Neills of the Fews, located mainly in County Armagh (2 samples), who branched off circa mid 1400s. It would be of immeasurable help in sorting through the O'Neill patrilineal decandancy if the persons recognized by the Chief Herald as heirs to the Clannaboy and the Tyrone/Fews O'Neills, or a patrilineal child/grandchild, could be persuaded to agree to DNA testing. Efforts by one of the authors have, as yet, been unsuccessful.

Summary of Major Findings

The major findings of the present research are:

1. Many men with surnames patrilineally linked to the Ui Neill line have Y-STR NWIrish Variety signatures.
2. There are at least two separate and different groupings of O'Neills, one related to the Ui Neill (NWIrish Variety), the other not (O'Neill Variety). Together they represent a large percentage of all O'Neills in the Tyrone O'Neill (Northern Ui Neill) areas of Ireland.
3. To date, all persons associated with the NWIrish Variety who have been tested for M222 have tested positive.
4. One person with the Y-STR O'Neill Variety haplotype was tested and found to be M222-.
5. Y-STR test results confirm the association of O Cathains and McLaughlins with the NWIrish Variety.
6. Y-STR test results strongly suggest association of McShanes with the O'Neill Variety.

Conclusions and Discussion

1. From the time of the introduction of the O'Neill surname until an unknown later date, it is likely the Royal (Tyrone) O'Neills were patrilineally connected to the Ui Neill line. This conclusion is based on the fact that a number of O'Neills have Ui Neill signatures (NW Irish Variety), as did numbers of O Cathains and McLaughlins, both of whom historically had common patrilineal ancestors with the Tyrone O'Neills (approximate 700s to 800s or 900s era). This is reinforced by the number of NW Irish Variety signatures and a number of positives for SNP M222 of persons with other Ui Neill-related surnames.

2. At some time the Royal O'Neill line was interrupted by a Non-Paternal Event (NPE) such that later Royal O'Neills had Y-STR O'Neill Variety signatures. This is based on the size of the ON Variety, the Y-DNA results of the McShanes, who have patrilineal ancestors common to the Tyrone O'Neills circa 1500s, and the SNP M222 negative test of one person related to the O'Neill Variety.
3. The most likely period for the NPE was the time frame of 900s-1500s.

4. Another alternate (but in our opinion, less likely) scenario would be that the main O'Neill Variety were non-related male introgressors absorbed into the clan from the surrounding population. But the main O'Neill Variety shows a strong founder effect more consistent with a single NPE or introgression event than with a random gathering of unrelated males into the clan. Furthermore, Y-STR signatures suggest the connection of the McShanes to the O'Neill Variety, consistent with historical links. The large numbers of O'Neills who match the main O'Neill variety appear to be the line of the chieftains who would have had a selective advantage in the survival of their genes.

Table 7 Y-STR Values for McShanes

	ON MH	McS 1	McS 2	McS 3	McS 4	McS 5	McS 6	McS 7
393	13	13	13	13	13	13	13	13
390	24	24	24	24	24	24	24	24
19	14	14	14	14	14	14	14	14
391	11	11	11	11	11	11	11	11
385a	12	12	12	12	12	12	12	12
385b	15	15	15	15	15	15	15	15
426	12	12	12	12	12	12	12	12
388	12	12	12	12	12	12	12	12
439	11	11	11	11	11	11	11	11
389-1	13	13	13	13	13	13	13	13
392	13	13	13	13	13	13	13	13
389-2	30	31	31	31	30	30	31	31
458	17	16	16	16	16			16
459a	9	9	9	9	9			9
459b	10	10	10	10	10			10
455	11	11	11	11	11			11
454	11	11	11	11	11			11
447	25	25	25	25	25			25
437	15	15	15	15	14			15
448	19	19	19	19	19			19
449		29	29	29	29			29
464a	15	15	15	15	15			
464b	15	15	15	15	15			
464c	17	17	17	17	17			
464d	17	17	17	17	18			
460	11					11		11
GATA H4	11					11		11
YCAIIa	19					19		19
YCAIIb	23					23		23
456	15					15		15
607						15		
576						17		
570						18		
CDYa						36		
CDYb						37		
442	13					13		13
438	12					12		12
461	12							12
462	11							11

Electronic-Database Information

- www.smgf.org Y-STR database
- www.ysearch.org Y-STR database
- www.ybase.org Y-STR database

Addresses of Surname Project Web Sites

The McShane Family

<http://members.aol.com/marjferns/myhomepage/mcshane-y.htm>

Clan McShane-Johnson-MacSeai'n Registry

<http://www.clanmcshane.org/registry.htm>

O'Dowd Clan DNA Project

<http://mysite.verizon.net/cdowd7/dna.htm>

O'Neill

[http://www.familytreedna.com/\(dcc5umelsf3ky155cprh0ubg\)/public/oneill/index.aspx](http://www.familytreedna.com/(dcc5umelsf3ky155cprh0ubg)/public/oneill/index.aspx)

Neal-O'Neal

[http://www.familytreedna.com/\(nbqin355gwwm2gy2t1srh445\)/public/Neal-2/index.aspx](http://www.familytreedna.com/(nbqin355gwwm2gy2t1srh445)/public/Neal-2/index.aspx)

O'Neal

http://www.familytreedna.com/surname_join.asp?code=K91143&special=True&projecttype=S

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