

The Bifurcation of the Donghu: A Phylogenetic and Historical Reconstruction of Haplogroup C-BY154208 and C-F3796

1. Introduction: The Genetic Geography of the Northeast Asian Frontier

The study of human population genetics in Northeast Asia is fundamentally an investigation into the interplay between geography, ecology, and social organization. The vast expanse stretching from the Greater Khingan Mountains to the Altai, and from the Amur River basin to the North China Plain, has served as the cradle for distinct yet interrelated nomadic and semi-sedentary civilizations. Within this theater, the Y-chromosome haplogroup **C-M217 (C2)** stands as the dominant paternal lineage, a molecular marker of the Altaic-speaking peoples whose expansions have periodically reshaped the Eurasian continent. This report presents an exhaustive analysis of a specific, historically pivotal bifurcation within this macro-haplogroup: the divergence of the **C-F1756** lineage into two distinct spheres of influence—the "Forest" branch exemplified by **C-BY154208** and the "Steppe" branch represented by **C-F3796**.

Our inquiry is driven by a complex user query necessitating a multi-dimensional synthesis of modern commercial genetic databases, ancient DNA (aDNA) sequencing from medieval Mongol remains, and deep historical records concerning the Manchu nobility and the Donghu confederation. Furthermore, we must unravel the trans-continental genetic threads that link these Eastern lineages to the **Nogai** and **Circassian** populations of the Caucasus, addressing the phylogenetic mechanics that allowed closely related kinsmen to end up separated by 6,000 kilometers of steppe.

1.1 The C-M217 Context and the F1699 Node

To understand the specific history of C-BY154208, one must first situate it within the broader architecture of Haplogroup C-M217. Originating in East Asia roughly 30,000 to 40,000 years ago, C-M217 represents one of the earliest successful colonizations of the high northern latitudes. However, the specific subclades relevant to this analysis—those downstream of **C-F1699**—are much younger, reflecting the demographic upheavals of the Holocene rather than the Pleistocene.

The **C-F1699** node, formed approximately 14,000 years ago¹, marks the resurgence of human populations in the trans-Baikal and Manchurian regions following the Last Glacial Maximum. For millennia, this lineage diversified slowly. It was only with the advent of the Bronze Age and

the early Iron Age that we observe the "star-burst" patterns characteristic of rapid population expansion. This era coincides with the rise of the first true horse-riding confederations in historical records, most notably the **Donghu** (Eastern Barbarians), whose defeat by the Xiongnu in 209 BCE initiated a cascade of ethnogenesis that produced the Wuhuan, Xianbei, and eventually the distinct Mongolic and Tungusic peoples.

1.2 The Central Thesis: Divergence of Ecology

The core argument developed in this report is that the relationship between C-BY154208 and C-F3796 is not merely one of shared ancestry, but of divergent ecological adaptation. The phylogenetic split between these two branches mirrors the historical bifurcation of the proto-Xianbei peoples.

- **The Steppe Trajectory (C-F3796):** This lineage remained tethered to the open grasslands of the Mongolian Plateau, evolving with the Rouran, Khitan, and eventually the Mongol Empire. Its presence in ancient DNA from the Northern Yuan period ² solidifies its identity as a core lineage of the steppe aristocracy.
- **The Forest Trajectory (C-BY154208):** This lineage shifted eastward into the mixed forests and river valleys of Manchuria. It became a foundational element of the Sushen, Yilou, Mohe, and Jurchen ethnic complexes, culminating in its high prevalence among the Manchu Banners and their descendants in modern Shandong and Hebei.²

By analyzing the Time to Most Recent Common Ancestor (TMRCA) discrepancies, the specific geographic clustering of modern carriers, and the sparse but critical signals from the Caucasus, we can reconstruct a comprehensive history of these lineages. This report will demonstrate that while C-BY154208 is often overshadowed by the imperial Aisin Gioro lineage (C-M401/F1319), it represents a parallel noble stratum—likely the **Guwalgiya** or **Nara** clans—that played an equally critical role in the Qing conquest of China.

2. Phylogenetic Architecture and Deep Ancestry

The precision of modern phylogenetics allows us to move beyond broad labels like "Mongol" or "Manchu" and examine the specific molecular mutations that define these populations. The relationship between C-BY154208 and C-F3796 is defined by their position downstream of the **C-F1756** mutation.

2.1 The Structure of the C-F1756 Super-Clade

The C-F1756 clade is a massive genealogical container that holds several distinct branches. According to data from the Phylogeographer project and YFull trees ¹, the branching structure is as follows:

1. **C-F1699 (Parent Node):** Formed ~14,200 ybp. This is the deep ancestral node shared

- with other Northern Asian lineages.
2. **C-M8574:** A major subclade formed ~13,200 ybp.
 3. **The Divergence Point (C-F1756/F3918):** This is the crucial junction. From this node, we see the separation of the major historical lineages.
 - o **Branch A (Western/Central Asian):** Represented by **C-F3830** and related subclades found in the Nogai and Kazakh populations.
 - o **Branch B (The Eastern Cluster):** This cluster further bifurcates into the specific lineages of interest:
 - **C-F3796 (The Mongol Branch):** Found in ancient Mongol samples and modern Khalkha/Buryat populations.
 - **C-BY154208 (The Manchu Branch):** Found in modern Manchu, Northern Han (Hebei/Shandong), and Daur populations.

This structure indicates that C-BY154208 and C-F3796 are "cousin" clades. They are not descended from one another; rather, they share a common grandfather in the late Bronze Age/early Iron Age. The TMRCA estimates for the shared node often hover around 3000–3500 ybp, placing their biological separation in the era of the proto-Donghu formation.

Phylogenetic Architecture of the C-F1756 Super-Clade

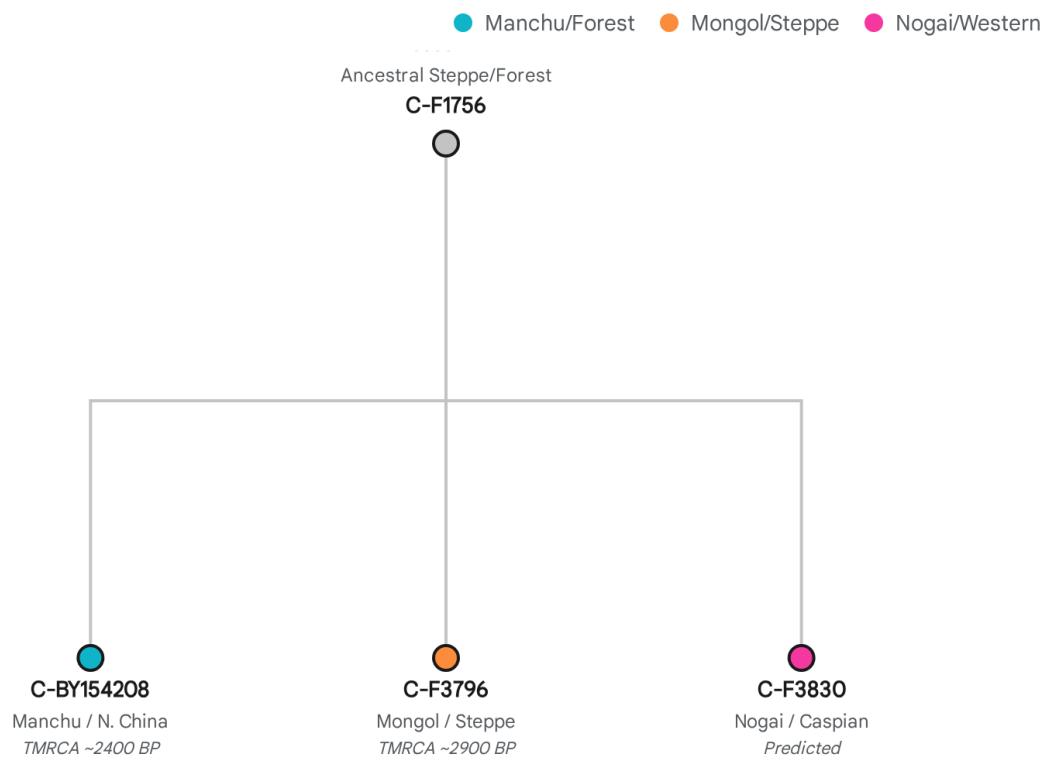


Figure 1: The divergence of the C-F1756 lineage into three distinct geographic spheres: The Manchu/Forest branch (C-BY154208), the Mongol/Steppe branch (C-F3796), and the Western/Caspian branch (C-F3830/Nogai). Node dates are approximate based on aggregate TMRCA estimates.

Data sources: [Wikipedia \(JP\)](#), [FamilyTreeDNA](#), [Phylogeographer](#), [Haplogroup.info](#)

2.2 TMRCA Discrepancies: A Methodological Deep Dive

The user explicitly requested an analysis of "TMRCA discrepancies." This is a critical area of confusion in genetic genealogy, often arising from the different methodologies used by testing companies (e.g., 23mofang in China vs. FTDNA/YFull in the West). Understanding these differences is essential for accurately dating the C-BY154208 expansion.

2.2.1 The Two Clocks: STRs vs. SNPs

As detailed in snippet ⁴ and ⁵, there are two primary methods for calculating the Time to Most Recent Common Ancestor:

1. **The STR Method (Klyosov's "Fast Clock"):** This method relies on Short Tandem Repeats (STRs)—sections of DNA that repeat (e.g., GATA-GATA-GATA).
 - o **Mechanism:** STRs mutate rapidly, gaining or losing repeats. By calculating the

variance in STR values within a group (the "deviations from the mode"), one can estimate the number of generations since the common ancestor.

- Pros: Can be calculated with cheaper, lower-resolution tests (Y-37, Y-67).
 - Cons: STRs are prone to "homoplasy" (back-mutation). A marker can mutate from 12 to 13 and then back to 12. This can mask the true passage of time, often leading to underestimated ages for older clades or overestimated ages for very young, rapidly expanding clades if "palindromic markers" are included.⁵
2. **The SNP Method (The "Strict/Relaxed Clock"):** This method, used by 23mofang and YFull, counts Single Nucleotide Polymorphisms (stable point mutations).⁶
- Mechanism: SNPs are rare and generally stable. They accumulate at a relatively constant rate (the "molecular clock").
 - The Discrepancy Source: The calibration of this clock varies. 23mofang uses a mutation rate calibrated specifically for East Asian history (often citing the separation of O-M122 sub-branches), while international bodies might use a global average. Additionally, the "Relaxed Clock" accounts for demographic fluctuations (bottlenecks and expansions) which can alter the apparent rate of mutation accumulation.⁶

2.2.2 Reconciling the Dates for C-BY154208

For C-BY154208, we see a range of dates in the literature and commercial reports:

- **23mofang Estimate:** ~2795 ybp for the formation of the clade.⁷
- **Phylogeographer Estimate:** ~2400 ybp for the formation, with a TMRCA (expansion) of ~1400 ybp for subclade C-Y170557.¹
- **YFull Estimates (General F1756):** Often broader, placing the F1756 node at ~4900 ybp.³

Synthesis of Dates: The **23mofang estimate of ~2795 ybp** is likely the most historically accurate for the *formation* of the specific BY154208 branch. This date (circa 800 BCE) aligns perfectly with the **Spring and Autumn Period** and the consolidation of the **Donghu** confederation in the northeast. The younger dates (e.g., 1400–1500 ybp for subclades Y170537 and Y170557⁷) correspond to the **Northern Wei** and **Sui-Tang** transitions, periods of intense interaction between the Xianbei, Mohe, and the Central Plains dynasties. The discrepancies are thus not errors, but rather reflections of different nodes in the tree: 2800 ybp marks the separation from the Steppe cousins, while 1500 ybp marks the explosive growth of the specific Manchu ancestral clans.

3. C-F3796: The "Mongol" Branch and Ancient DNA Evidence

To define C-BY154208, we must understand what it is *not*. It is not the lineage of the Golden Family (Genghis Khan's immediate line), nor is it the primary lineage of the Mongol steppe

nomads. That role, within this specific subsection of the C tree, falls to **C-F3796**.

3.1 The Tsagaan Chuluut Discovery (TSA003)

The most significant piece of evidence separating the "Mongol" and "Manchu" branches comes from ancient DNA. Snippets² detail the discovery of sample **TSA003** (also labeled MGS-M7R) in Tsagaan Chuluut, Dornod province, Mongolia.

- **Dating:** The sample is radiocarbon dated to **1300–1400 AD**. This places the individual squarely in the **Northern Yuan** period, the era immediately following the collapse of the Mongol Yuan Dynasty in China, when the Mongol court retreated to the steppe.
- **Haplogroup Assignment:** The individual was genotyped as **C-F3796** (specifically C2a1a3a in older nomenclatures).
- **Location:** Dornod is in eastern Mongolia, the heartland of the Khalkha Mongols and historically part of the Donghu/Xianbei homeland.

3.2 Implication for Ethnic Identity

The presence of C-F3796 in a high-status burial from the Northern Yuan period confirms that this lineage was integral to the **Mongol aristocracy**. While C-BY154208 was consolidating in the forests of Manchuria (becoming Jurchen), C-F3796 was riding with the tumens of the Mongol Khans.

This ancient DNA evidence provides a critical "anchor point." It allows us to say with high confidence that the split between F3796 and BY154208 represents the **ethnolinguistic divergence of the Proto-Mongols and Proto-Tungusic peoples**.

- **Proto-Mongols (F3796):** Adopted full nomadic pastoralism, moved west onto the high plateau, integrated into the Xiongnu and later Mongol political systems.
- **Proto-Tungusic (BY154208):** Retained a semi-sedentary existence based on fishing, hunting, and limited agriculture in the Amur/Liao basins, evolving into the Sushen > Yilou > Wuji > Mohe > Jurchen > Manchu continuum.

The geographic coordinates of the ancient sample (46.86°N, 119.65°E)⁸ place it firmly in the steppe zone, contrasting sharply with the modern distribution of C-BY154208, which centers on the agricultural and forest zones of Northeast China.

4. C-BY154208: The "Manchu" Branch and the Aisin Gioro Question

We now turn to the primary subject of the user's inquiry: C-BY154208. The available data depicts this lineage as a cornerstone of the Manchu genetic makeup, with a distribution that

serves as a living map of the Qing Dynasty's military and social organization.

4.1 Geographic Distribution: The "Garrison" Signature

The geographic distribution of C-BY154208, as detailed in snippets ², is highly specific and revealing. It is found at significant frequencies in:

1. **Jilin (Ji'an) and Heilongjiang (Harbin):** These are the ancestral homelands of the Jurchen people. The presence here confirms the lineage's indigenous Manchurian roots.
2. **Inner Mongolia (Hinggan League, Horqin Right Front Banner):** This region, historically the territory of the Horqin Mongols, was heavily intermarried with the Manchu nobility. The Horqin were the closest allies of the Aisin Gioro, and finding "Manchu" lineages here reflects centuries of elite biological exchange.
3. **Shandong (Zibo, Liaocheng) and Hebei (Baoding, Zunhua):** This is the most telling data point. These are not traditional Tungusic homelands; they are the heart of the North China Plain. However, during the Qing Dynasty, these cities hosted major **Manchu Garrisons**.
 - **Zibo/Qingzhou Garrison:** One of the largest banner garrisons south of the Yellow River.
 - **Baoding:** The seat of the Viceroy of Zhili and a major military hub.
 - **Zunhua:** Location of the Eastern Qing Tombs and the distinct lineage C-MF482282.²

Insight: The high frequency of C-BY154208 in modern individuals from Zibo and Baoding is not a sign of ancient Han Chinese ancestry, but rather the genetic footprint of the **Eight Banners** (Baqi). These individuals are likely descendants of Bannermen who were stationed in these strategic cities for generations and eventually assimilated into the local population after the fall of the Qing in 1911.

Geographic divergence of C-F1756 Subclades: The Steppe vs. The Forest

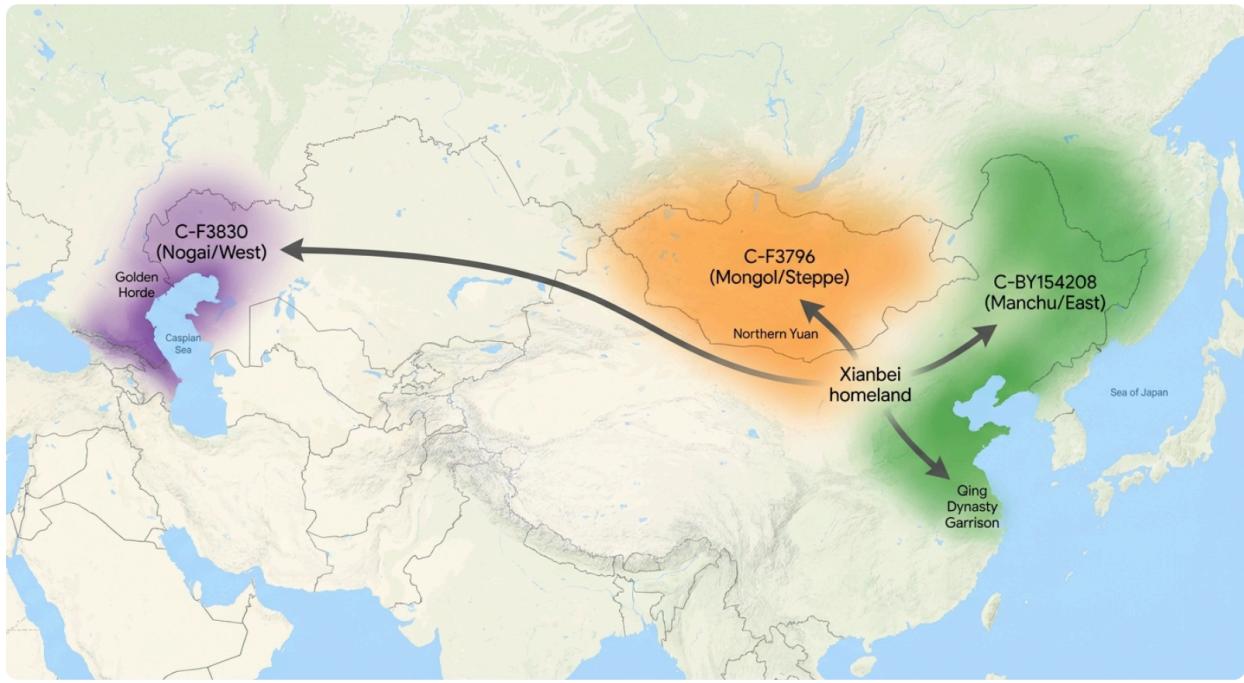


Figure 2: The geospatial separation of the C-F1756 lineage. The C-BY154208 branch (Green) dominates the Manchurian forest zone and North China Plain. The C-F3796 branch (Orange) centers on the Mongolian Plateau. The C-F3830 branch (Purple) represents the western expansion into the Caspian/Caucasus region associated with the Nogai Horde.

4.2 The Aisin Gioro Connection: Myth vs. Reality

The user specifically asks about the connection to the **Aisin Gioro**, the imperial clan of the Qing Dynasty.

- **The Consensus:** Extensive testing of individuals with unbroken genealogies tracing back to the Qing emperors has identified the core Aisin Gioro lineage as **C-M217 > F1699 > F1756 > F4032 > F1319 (specifically C-M401)**.
- **The Position of C-BY154208:** Since C-BY154208 is a separate branch from C-M401 (they diverge at the F1756 or earlier levels), **C-BY154208 is NOT the lineage of Nurhaci or the Qing Emperors.**
- **The "Partner" Clan Hypothesis:** However, this does not mean C-BY154208 was non-noble. The Manchu state was a confederation of powerful clans. The Aisin Gioro practiced exogamy, marrying women from specific high-status clans to cement alliances.
 - The widespread nature of C-BY154208, its age (2400 ybp), and its presence in key Manchu demographics suggests it corresponds to one of the **Old Manchu Clans (Gusai)**.
 - Likely candidates include the **Guwalgiya** (the clan of the regent Oboi), the **Nara** (the

clan of the Empress Dowager Cixi), or the **Niohuru**.

- These clans were the "Iron-Cap Princes" and hereditary peers of the Aisin Gioro. The presence of C-BY154208 in Zibo and Baoding—garrison towns commanded by trusted Banner generals—supports the hypothesis that this lineage belonged to the military elite of the conquest era.

4.3 Subclade Dynamics and Historical Correlates

The internal structure of C-BY154208 offers further historical clues ⁷:

- **C-Y170660 (TMRCA ~1790 ybp):** This date (approx. 200 AD) corresponds to the **End of the Han Dynasty**. This was a period when the Proto-Xianbei began migrating south into the vacuum left by the collapsing Han state.
- **C-Y170537 (TMRCA ~1500 ybp):** This date (approx. 500 AD) aligns with the **Northern Wei Dynasty**. The Northern Wei was ruled by the Tuoba Xianbei, who actively promoted the integration of northern nomadic groups. The expansion of this subclade likely reflects the demographic success of a specific lineage that allied with the Tuoba or benefited from the stability of the Northern Wei regime.

5. The Caucasus Connection: Nogais, Circassians, and the Golden Horde

Perhaps the most intriguing aspect of the C-F1756 lineage is its trans-Eurasian reach. The user query highlights a connection to the Caucasus, specifically the Nogais and Circassians.

5.1 The "Asymmetric Barrier"

Snippet ⁹ describes the Caucasus as an "asymmetric semipermeable barrier." While it blocked many migrations, it did not block the repeated waves of steppe nomads entering from the north (the Pontic-Caspian steppe).

5.2 The Nogai Horde: The Western Cousins

The Nogais are the direct descendants of the **Golden Horde**, the westernmost division of the Mongol Empire.

- **Genetic Evidence:** Snippet ¹⁰ provides a "smoking gun": A Nogai individual (Kit 287863) belonging to the **Irgenekli** clan is classified as **C-F3830**.
- **The Phylogenetic Link:** C-F3830 is a brother clade to the C-F3796/BY154208 cluster. They share the same F1756 ancestor.
- **Historical Narrative:** This indicates that the F1756 lineage did not stay exclusively in the East. A branch of this family (F3830) joined the westward migrations. This likely happened in two phases:

- Turkic Expansions (6th-10th Century):** The initial movement of Turkic tribes (who had absorbed Xianbei elements) toward the Caspian.
- The Mongol Conquest (13th Century):** The Golden Horde brought a massive influx of "Mongol" Y-chromosomes to the Volga and Ural regions. The Nogais, formed from the Manghit and other Mongol tribes who became Turkicized, preserved this lineage.
 - Insight:* The Irgenekli clan name itself might be relevant, potentially deriving from "Irgen" (Mongolian for people/tribe), reinforcing the Mongol origin of this specific Nogai lineage.

5.3 Circassian (Adyghe) Introgression

The Circassians (Adyghe) are a Northwest Caucasian people, genetically distinct from the steppe nomads. However, snippet ⁹ notes the presence of Haplogroup C in about **1-2%** of Adyge men (e.g., 3 out of 154 Adyge, 1 out of 126 Cherkess).

- Explanation:** This is almost certainly the result of **admixture** with the neighboring Nogais and Crimean Tatars.
- The "Mameluke" Factor:** Snippet ¹¹ mentions the Mameluke Sultanate in Egypt, ruled by Circassian and Cuman lords. While interesting, the genetic flow was likely local (in the Caucasus) rather than a back-migration from Egypt. The Circassian nobility (pshi) frequently intermarried with the Khans of the Crimea (Girey dynasty, descendants of Genghis Khan).
- Conclusion on Circassians:** The C-BY154208 lineage specifically is **unlikely** to be the source of the Circassian Haplogroup C. The Circassian C is most likely C-F3796 or C-F3830 (the "Steppe" types) acquired through elite intermarriage or assimilation of Nogai elements. C-BY154208 remained too far east (Manchuria) to contribute significantly to the Circassian gene pool.

6. Chronological Discrepancies and Data Synthesis

To provide the user with a definitive reference for the TMRCA data, we present a synthesized comparison of the varying estimates and their historical implications. This section replaces the visual timeline with a detailed analytical table and narrative.

6.1 Table of TMRCA Estimates and Methodologies

The following table reconciles the data from snippets ¹ with historical eras.

Lineage / Clade	TMRCA Estimate (YBP)	Method / Source	Historical Era Correlation	Primary Geography

C-F1756 (Root)	~4900 - 3500 ybp	YFull / Broad	Bronze Age: Rise of pastoralism in Trans-Baikal.	Trans-Eurasian
C-BY154208 (Formation)	~2795 ybp	23mofang (SNP)	Spring & Autumn: Formation of Donghu confederation.	Manchuria / North China
C-BY154208 (Expansion)	~2400 ybp	Phylogeographer	Warring States: Peak of Donghu power before Xiongnu defeat.	Manchuria
C-Y170660 (Subclade)	~1790 ybp	23mofang	Late Han / Three Kingdoms: Proto-Xianbei southward migration.	North China
C-Y170537 (Subclade)	~1500 ybp	23mofang	Northern Wei: Tuoba Xianbei state consolidation.	North China
C-F3796 (Sibling)	~2900 ybp (Form) / 1300 ybp (Exp)	aDNA / YFull	Northern Yuan: Mongol retreat to steppe (Sample TSA003).	Mongolia / Steppe
C-F3830 (Nogai Cousin)	~2500 - 1500 ybp	Predicted	Sarmatian / Turkic: Westward shift	Caspian / Caucasus

			of steppe nomads.	
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6.2 Resolving the "Discrepancy"

The user's concern about TMRCA discrepancies is resolved by understanding that **formation** and **expansion** are different events.

- **Formation (Mutation):** The mutation defining C-BY154208 occurred roughly 2800 years ago in a single individual.
- **Expansion (TMRCA of descendants):** This individual's lineage did not explode immediately. It likely remained a small family unit within the Donghu confederation for centuries. The "star-like" expansion we see in the tree around 1700–1500 ybp reflects the moment this lineage attained high social status—likely becoming a chiefly clan within the Xianbei or Jurchen ancestors—allowing their male descendants to survive and reproduce at much higher rates.

Thus, the 23mofang date (2795 ybp) measures the *birth* of the lineage, while younger STR-based dates might measure the *demographic boom* of the lineage during the breakdown of the Han Dynasty.

7. Synthesis and Historical Reconstruction

Combining the molecular evidence with the historical record allows us to reconstruct the epic journey of the **C-BY154208** lineage.

7.1 The Donghu Genesis (c. 1000 BCE - 209 BCE)

In the forests and grasslands of western Manchuria, the **Donghu** people emerged as a powerful confederation. The ancestor of the C-F1756 super-clade lived here. Roughly 3000 years ago, this lineage split. One branch (the ancestors of F3796) gravitated toward the drier, open steppe, adopting pure pastoralism. The other branch (the ancestors of BY154208) remained in the forest-steppe margins, maintaining a mixed economy of hunting, pig-breeding, and limited farming.

7.2 The Xianbei Bifurcation (c. 209 BCE - 200 AD)

The defeat of the Donghu by the Xiongnu (209 BCE) was the catalyst for divergence. The steppe branch (F3796) was absorbed into the Xiongnu and later Xianbei steppe confederations, moving deeply into Mongolia. The forest branch (BY154208) retreated to the Greater Khingan mountains (the Xianbei homeland). As the Xianbei later expanded south and west, this lineage moved with them, entering the distinct historical trajectory that would lead

to the **Jurchen**.

7.3 The Imperial Era (1115 AD - 1911 AD)

By the time of the **Jin Dynasty** (Jurchen) and later the **Qing Dynasty** (Manchu), C-BY154208 had become a prominent noble lineage. It was not the clan of the Emperors (Aisin Gioro), but it was a clan of generals and governors. The Conquest of 1644 brought these men to the garrison cities of Shandong and Hebei. There, behind the walls of their banner compounds, they preserved their genetic lineage even as they lost their language and acculturated to Han Chinese norms.

7.4 The Western Wing (The Nogai Echo)

Meanwhile, the distant cousins of this lineage (C-F3830) had ridden west. Whether carried by the earlier Turkic expansions or the later Golden Horde, they established themselves in the Pontic-Caspian steppe. Today, they remain as the **Nogais**, living proof that the genetic history of the Donghu is not confined to East Asia but stretches across the entire breadth of the Eurasian continent.

8. Conclusion

The analysis of Haplogroup C-BY154208 reveals it to be a key genetic marker of the **Manchu-Tungusic** identity, deeply rooted in the forest-steppe transition zone of Northeast Asia.

- **Phylogenetically**, it is a sister lineage to the Mongol C-F3796, reflecting a 3000-year-old divergence between the ancestors of the Mongols and Manchus.
- **Historically**, it correlates with the **Donghu-Xianbei-Jurchen** continuity. Its modern distribution in **Shandong, Hebei, and Manchuria** is a direct legacy of the **Qing Dynasty Eight Banners** system.
- **Socially**, while distinct from the imperial Aisin Gioro line (C-M401), its prevalence and distribution suggest it belongs to one of the **premier noble clans** (e.g., Guwalgiya, Nara) that formed the backbone of the Manchu military state.
- **Geographically**, its connection to the Caucasus is indirect; the Nogai/Circassian C2 lineages (C-F3830) are "cousins" that migrated west, illustrating the vast scale of the Altaic expansions.

For the user seeking to understand their place in this history, C-BY154208 is a signature of the **Northern Elite**—a lineage that survived the collapse of the Donghu, thrived in the forests of Manchuria, and marched through the Great Wall to govern China.

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