

King Richard III and his mitochondrial DNA haplogroup J1c2c3

The J1c2c3 Discoveries: Points, Details, and Sources.

2017

The following key points come from four years of research on a project to determine the relation of living J1c2c3 mitochondrial DNA subjects to King Richard III. Much of this work is discussed in the published paper “King Richard III and his mitochondrial DNA haplogroup J1c2c3”¹ at:

<http://www.qualifiedgenealogists.org/ojs/index.php/JGFH/article/view/32/17>

Additional genealogy work and project background can be found at the project’s website:

<http://www.historysoft.com/richard3/>

Point 1: An overwhelming piece of evidence for the bones of King Richard III.

Our research provides an “overwhelming” piece of evidence that proves the bones found at Grey Friars are that of King Richard III. When the full sequence mitochondrial DNA (mtDNA) work was completed on the bones of King Richard III (Dec 2014), it was noted (in GenBank²) that the evidence for the case was overwhelming. We believe our J1c2c3 research has significantly raised the level of certainty that the bones are, in fact, that of King Richard III. The initial proof of the bones was based on a partial mtDNA test (2013) that showed a haplogroup of J1c2c. The full sequence revealed a new mutation making the real haplogroup to be J1c2c3. Dr. Ian Logan (of this project) had already created the J1c2c3 haplogroup for the first documented J1c2c3 (David Brinkman) in February of 2014. Our work over the last 4 years provides this missing point (needed for the statement of “overwhelming” evidence) by showing that the new mtDNA haplogroup of J1c2c3 is extremely rare. The initial King Richard III work noted a match probability of 1 in 916³ for the mitochondrial DNA. Our work shows that probability dropping to an overwhelming level of proof. Looking at all the lineages of the known J1c2c3 matches (American and English with the American lines being discussed in the paper⁴), we have concluded that there are only 300 possible J1c2c3s matches that could come from these lines. This makes the probability 1 in 26,666,667⁵.

Our 4 years of researching different DNA databases and contacting J1c2c matches show a J1c2c/J1c2c3 ratio of 3 J1c2c3's to 142 J1c2c's. This has been observed in both 23andme and the National Geographic Society's Genographic Project. The following is a listing of J1c2c and J1c2c3 matches from the National Geographic Society's Genographic Project provided by Haplogroup.org⁶ on June 20, 2017.

J1c2c3 (3 in total): United States (a project member): 1, Unspecified: 2.

J1c2c (142 in total):

¹ “King Richard III and his mitochondrial DNA haplogroup J1c2c3” by Ian Logan and David Brinkman: <http://www.qualifiedgenealogists.org/ojs/index.php/JGFH/article/view/32/17>

² Identification of the remains of King Richard III: <https://www.ncbi.nlm.nih.gov/pubmed/25463651>

³ Identification of the remains of King Richard III: Nature: <https://www.nature.com/articles/ncomms6631>

⁴ “King Richard III and his mitochondrial DNA haplogroup J1c2c3” by Ian Logan and David Brinkman: <http://www.qualifiedgenealogists.org/ojs/index.php/JGFH/article/view/32/17>

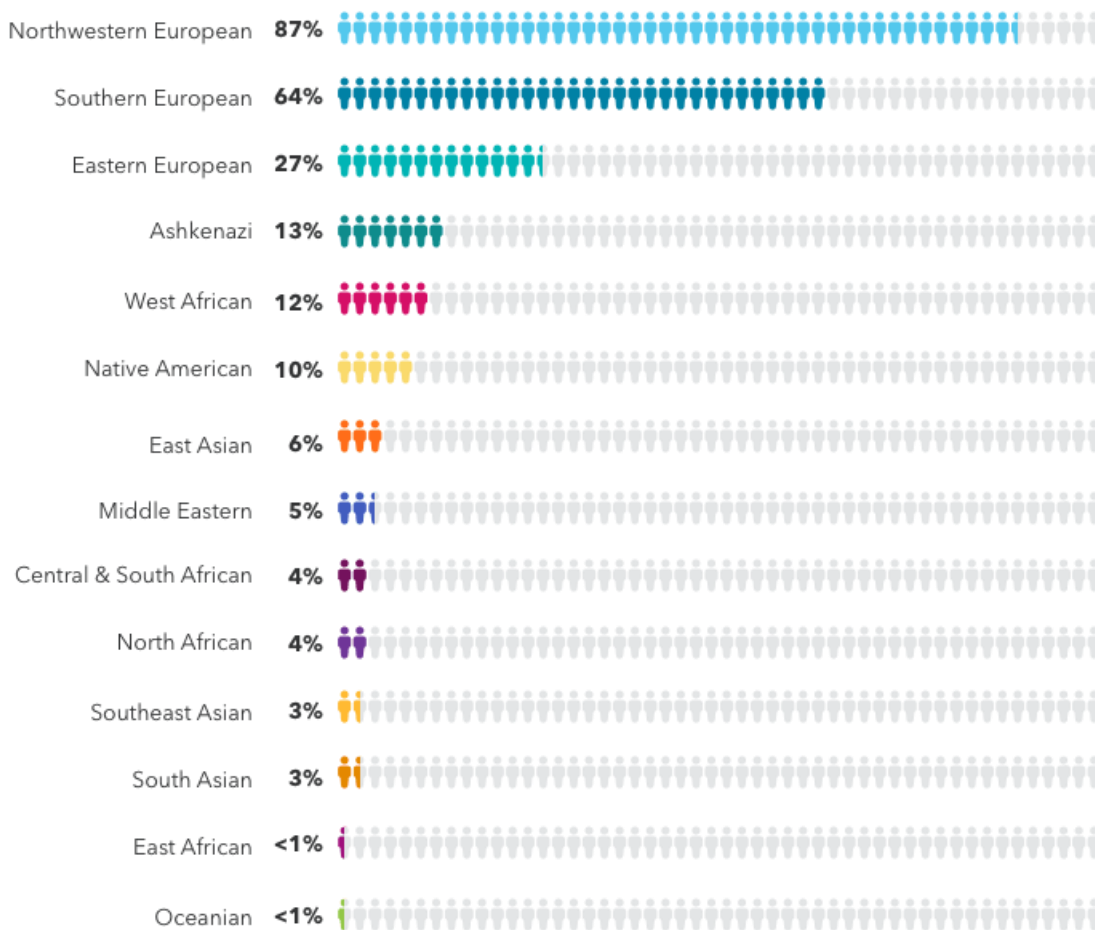
⁵ Ratio assumes a world population of 8 billion: 300/3 billion = 1/26,666,667

⁶ <http://haplogroup.org/mtdna/rsrs/l123456/l23456/l2346/l346/l34/l3/n/r/jt/j1/j1c/j1c2/j1c2c/> and <http://haplogroup.org/mtdna/rsrs/l123456/l23456/l2346/l346/l34/l3/n/r/jt/j1/j1c/j1c2/j1c2c/j1c2c3/>

Unspecified: 79, United States: 46, England 3, Portugal: 3, Canada: 2, Australia: 2, South Africa: 2, Latvia: 1, Russia: 1, Germany: 1, Sweden: 1, India: 1.

In our “King Richard III and his mitochondrial DNA haplogroup J1c2c3”⁷ paper, the breakdown of J1c2c subclades is shown. Even though it has the same name, the haplogroup J1c2c is also a subclade of J1c2c as well as other subclades like J1c2c3. The j1c2c subclade has an estimated 500,000 people in the world while the J1c2c total group has 3,000,000. As part of our proof, we wanted to verify this number using the largest mtDNA database in the world which is 23andme:

Below is the breakdown of ancestry⁸ based on the 23andme.com database of 2,000,000 DNA tests⁹. Taking each percentage as a weight, the European weights add up to 191 out of a total of 238. This shows that 80% (191/238) of 23andme participants have European ancestry.



23andme has not updated their haplogroups over the last 4 years so J1c2c and all its subclades show as just J1c2c. 23andme tells each user the occurrence of their haplogroup. For J1c2c*, it is 1 in 480 = (2,000,000 users * 1/480 = 4,167).

⁷ “King Richard III and his mitochondrial DNA haplogroup J1c2c3” by Ian Logan and David Brinkman: <http://www.qualifiedgenealogists.org/ojs/index.php/JGFH/article/view/32/17>

⁸ From 23and.com Insights: Proportion of all 23andMe research participants whose Ancestry Composition includes at least 1% of an ancestry.

⁹ Autosomal DNA testing comparison chart by the International Society of Genetic Genealogy Wiki: https://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

As shown above, 23andme shows the breakdown of all the ancestry and 80% of those tested are European even though only 15% of the world is European. This 15% comes from: 710 million Europeans in Europe, 230 million European-descended Americans in US, 200 million Latin Americans, 54 million in Australia, Canada, and Africa, and 3 million European New Zealanders) and totals 1.197 billion.

We now need to normalize these numbers for European and the fact that J1c2c is only European:

There are 2,000,000 people in the 23andme database so Europeans (80%) would be 1,600,000.

There are 8 billion people in the world so Europeans (15%) would be 1.197 billion.

23andme shows there are 4,167 J1c2c* people in their database.

Doing some basic algebra:

$4,167 \text{ J1c2c} / 1,600,000 \text{ Europeans} = X / 1,197,000,000 \text{ Europeans}$

$X \text{ (number of J1c2c* people in the world)} = 4,167 * 1,197,000,000 / 1,600,000 = 3,117,437$

So, using the largest mtDNA database in the world, we have proven that the estimated and accepted number of J1c2c people in the world (3,000,000) is accurate. It will be safe to say that the sub groups under it are also good (including the 500,000 for the J1c2c subclade).

Given the established and accepted estimate of 500,000 J1c2c's in the world, you could expect (if everyone in the world was tested) as many as 10,563 J1c2c3's in the world¹⁰. That probability would be 1 in 757,333¹¹.

Even this higher probability is in the order of 3 magnitudes more significant than the original DNA proof given on King Richard III's bones. This 3 and 4 magnitude improvement on the mtDNA related proof is overwhelming.

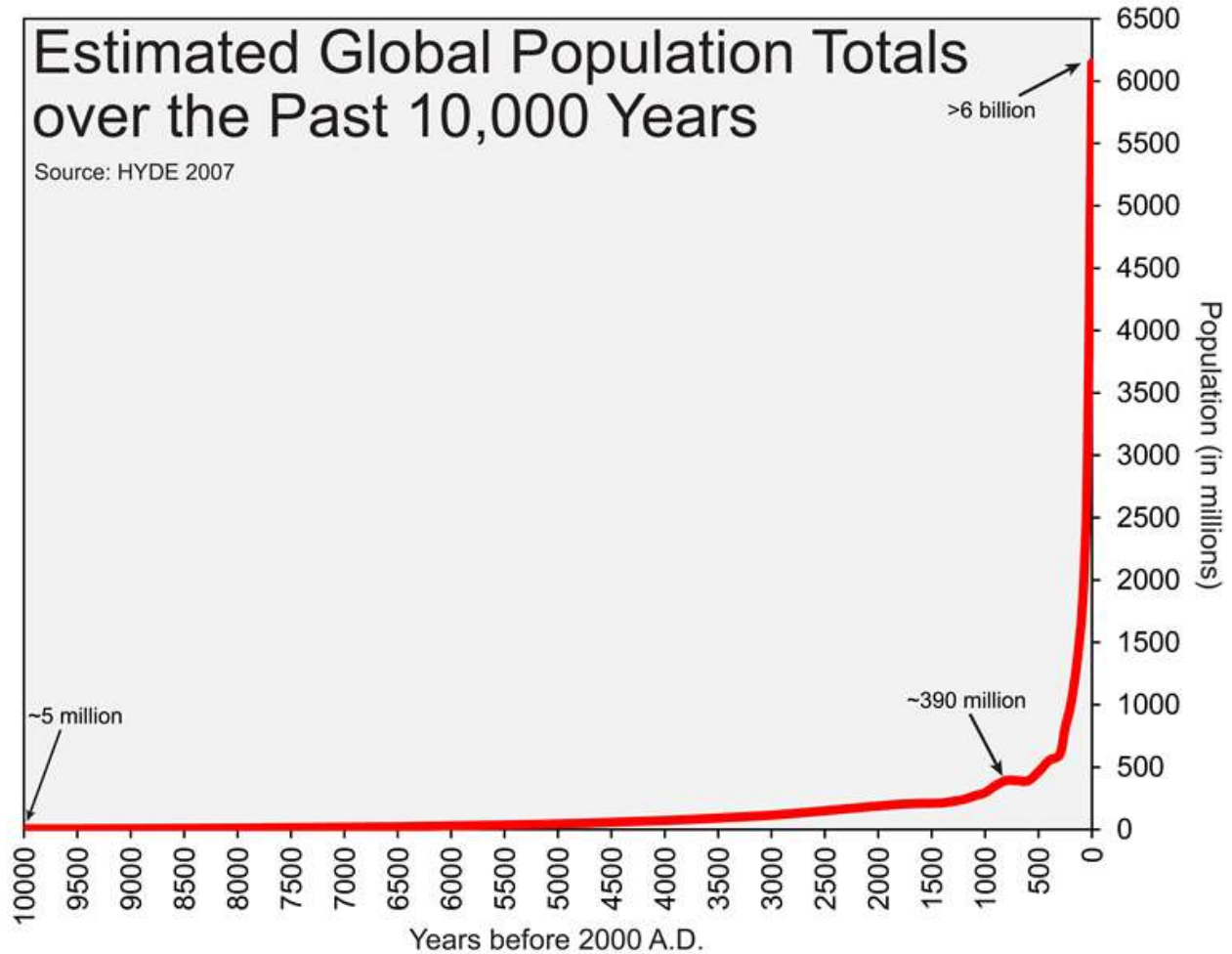
Point 2: J1c2c3 may have been born in England in the Plantagenet Family

Our research also shows that all living J1c2c3 people have maternal lines going straight to England unlike the J1c2c which is scattered over Europe¹². This may mean that the mutation that made J1c2c3 occurred within the Plantagenet Family itself. Maybe only a few generations from King Richard III. This theory is also based on an interesting population phenomenon that occurred in the prime years of the Plantagenet family between the years 1200 and 1500. This is the only historical period where the world's human population dropped. Despite this, however, the well documented genealogy of the Plantagenet family shows many women having 4 to 12 children each and most of these living to adulthood. A huge population explosion occurred in the family during this time. The mutation that formed J1c2c3 may well have occurred here. The low numbers and pure English maternal line ancestry of J1c2c3 people also point to this possibility.

¹⁰ This calculation comes from the previous determined J1c2c3/J1c2c ratio of 3/142. $500,000 * 3 / 142 = 10,563$

¹¹ $1 / 757,333$ is the J1c2c3 number 10,563 divided by the world population of 8 billion.

¹² This can be seen in Point #1 where National Geographic Society's Genographic Project's data on J1c2c.



Point 3: Why there are no J1c2c3 matches in Europe

Despite the pure English maternal line ancestry of the J1c2c3 matches, none of them live in England. 18 are in the United States (all found by this project), one is from Canada, and one is from New Zealand. Not a single living J1c2c3 has been found in Europe. Note: Much of our effort over the last four years has been searching through DNA databases, advertising, and contacting possible matches. To date, only a total of 20 living J1c2c3s have been found in the world. The work noted in Point #1 (National Geographic Society's Genographic Project database) shows a more than 4X greater number of J1c2c matches in the United States than in Europe even though there are more people in Europe. The J1c2c haplogroup originated in Europe over 2,000 years ago¹³. This clearly shows that at least 4 times (maybe as much as 10 times) as many people in the US are doing DNA tests. With only 3 of these J1c2c people (in National Geographic Society's Genographic Project) from England and the fact that J1c2c3 is relatively young and smaller in numbers, this probably explains why no J1c2c3s have been found in England. If J1c2c3 developed in another part of Europe, you would expect (even with the 4X greater testing in the US) at least a few J1c2c3's to show up by now. Again, as stated in Point #2, J1c2c3 probably developed in England where there has not been enough testing to show J1c2c3 matches.

¹³ Haplogroup.org: <http://haplogroup.org/mtdna/rsrs/l123456/l23456/l2346/l346/l34/l3/n/r/jt/jj1/j1c/j1c2/j1c2c/>

Point 4: All living J1c2c3 people are likely to be related to the immediate family of King Richard III.

This point is covered in our published paper: "King Richard III and his mitochondrial DNA haplogroup J1c2c3"¹⁴. Work continues to complete genealogy of the different lineages to King Richard III.

Point 5: The DNA ancestry of the United States is heavily weighted to the Jamestown settlement and the Plantagenets.

Continued genealogy is also showing that the DNA of the United States is strongly influenced by the settlement at Jamestown and that many of the people that came to Jamestown were Plantagenets. This goes along with the extensively studied ancestry of US Presidents which shows, all but one, had Plantagenet ancestry. In his presentation to the Explorers Club, Brinkman provides information on the project's genealogy work that shows the Plantagenet/Jamestown connection. The presentation can be viewed at:

<https://www.youtube.com/watch?v=xYsX1m5CqVI>

Project coordinators:

Ian Logan is a retired medical practitioner living in Exmouth, Devon, UK. He has been involved with genealogy for over twenty years and is a committee member and Record Keeper for the Brooking Society. He has authored and co-authored several papers about different aspects of mitochondrial DNA and has a special interest in Leber Hereditary Optic Neuropathy. He maintains a personal website with nearly 1000 pages dealing with the mtDNA sequences available in the public domain, sorted by their haplogroups.

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David Brinkman is a software engineer and two-times Chairman of the Greater Piedmont Chapter of The Explorers Club. He lives in Columbia, South Carolina, USA and was extremely pleased and fascinated to find that his mtDNA sequence matched that of King Richard III. He is a keen amateur archaeologist looking at his local region and has recently received the 2017 Distinguished Archaeologist of the Year Award from the Archaeological Society of South Carolina. For the last four years he has been coordinating a search in America for other mitochondrially related descendants of the family of King Richard III.

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¹⁴ "King Richard III and his mitochondrial DNA haplogroup J1c2c3" by Ian Logan and David Brinkman: <http://www.qualifiedgenealogists.org/ojs/index.php/JGFH/article/view/32/17>