

MOTHERLAND - THE SCIENCE BEHIND THE PROGRAMME

In the first study of its kind, conducted for the BBC documentary film Motherland, geneticists have discovered that on average, more than a quarter of British African Caribbean men have a Y chromosome (passed from father to son) which traces back to Europe rather than Africa.

In the same study it was found that only around 2% of British African Caribbeans have mitochondrial DNA (passed from mother to child) which traces to Europe rather than Africa.

The vast majority of British African Caribbeans are descended from the millions of Africans who were shipped across the Atlantic to work as slaves on Caribbean sugar plantations.

Dr Mark Jobling from the University of Leicester who analysed the Y chromosome said of his findings:

This really reflects the sexual politics of the situation of slavery. This was a power relationship between two populations and in that power relationship it was European men who were having sex with African women

For the first time, this study quantifies the full impact of that power relationship: more than one in four male ancestors of today's African-Caribbean community were white.

The study is also the most comprehensive attempt so far to investigate the specific African roots of people whose ancestors were shipped west into slavery. Its most spectacular individual success was to "reunite" an African-Caribbean woman from Bristol with living African relatives on a tiny island off the coast of Cameroon.

Dr Peter Forster from the McDonald Institute in Cambridge who specialises in mitochondrial DNA analysis has a database containing all the mitochondrial sequences ever published. By entering the sequence belonging to 37 year old Beaula McCalla, he was confronted with what he calls a "truly remarkable result".

Only 8 people in the global database exactly matched Beaula's sequence, and they all came from the Bubi population on the tiny island of Bioko. After further testing of the intrigued islanders, Beaula was flown out to Bioko for a truly historic reunion with her relatives.

The other 228 volunteers who took part in the study were also told which African population groups most closely resembled their own mitochondrial DNA sequences: where their Y chromosome came from (men only) and what their individual levels of African and European ancestry were.

Though the study could in some cases pinpoint for individuals very precise African ancestral roots, the study also demonstrated that on average, 13 in every 100 ancestors of today's Black Britons of Caribbean descent would be European. This third test, looking beyond patrilineage and matrilineage to genetic evidence from the full range of an individual's ancestors, was conducted by Dr Mark Shriver of Penn State University and its results seem to confirm those from Leicester and Cambridge.

Dr Shriver also examined the link between African ancestry and pigmentation. He found that although levels of African ancestry may in some cases be a rough guide to how light or dark a person is, appearances can be deceptive.

In the course of his work, Dr Shriver discovered that although he looks like he stepped off the Mayflower, he is in fact 25% African. For Dr Shriver, this demonstrates the inadequacies of definitions based on race, colour or country of origin, disguising as they do the variations between seemingly similar people and the range and diversity of individuals ancestors.

Motherland Background

During the transatlantic slave trade, at least 12 million Africans were shipped across the Atlantic into slavery. These enslaved people came from hundreds of different ethnic groups in West and West Central Africa but it was not long before their different cultures, languages and ethnicities were lost to a system that viewed them as commodities rather than individuals. As no paper records existed that could hold the key to these lost identities, the descendants of the African slaves had reluctantly come to accept that they could never know with any certainty where their ancestors came from.

The Motherland project sought to harness genetics to reconnect individuals with this lost heritage. Conceived and produced by independent film-makers Archie Baron, Tabitha Jackson and Dr Neil Cameron of Takeaway Media, and commissioned by the BBC, the Motherland project turned into a ground-breaking three year undertaking which brought together 229 volunteers with scientists from Britain and America.

Motherland Objectives

The Motherland project had two ambitious objectives: firstly, to see what genetics could reveal about the ancestry of British African-Caribbeans in general; secondly, to see whether genetics could reconnect individuals to contemporary African population groups.

Motherland Methodology

Takeaway Media's team recruited 229 African Caribbean volunteers from around Britain, 112 men and 117 women. The only criterion was that all four of their grandparents should also be African Caribbean. The volunteers gave us a sample of their DNA on a buccal swab which was then anonymised before being sent to the University of Leicester for extraction.

Motherland Results

As well as the general results outlined above, three of the most intriguing individual case studies are featured in the BBC documentary.

Beaula McCalla is a Barnado's project worker born in Bristol of Jamaican parents, but with a strong sense of Africa:

"I call myself an African first and foremost, and for me to be able to say that, and to explain to other people about that, I really do need to know what that means."

She discovers that her mtDNA is an exact match to the Bubi people on the tiny island of Bioko. Her sequences match no-one else's in the world sampled so far. In a remarkable and historic journey, Beaula travels to Bioko to meet her maternal relatives and discover whether a genetic similarity can overcome vast cultural differences.

Mark Anderson, a young South Londoner who works in the music business has never felt he belongs in Britain, even though he was born and raised here:

"I just realised that a lot of people saw themselves as being more British than I was and they looked at me as being some sort of foreigner."

Ironically when Mark receives the results of his Y chromosome analysis he is shocked and dismayed to discover that it traces not to Africa but to Europe. "It's weird" he admits, "This is the first time that my mind has been opened up to think of the whole world as being like brothers. Until now I thought Europeans and their history had nothing to do with me."

The genetic news that Mark wanted is found on his mother's line: Mark's mtDNA takes him to the edge of the Sahara where he meets the Kanuri people of Niger. It is here that he learns uncomfortable truths about the role that his own Kanuri people played in the slave trade.

Jacqueline Harriott is a schoolteacher from Peterborough. Coming from a Jamaican family who consider Britain to be the Motherland, Jacqueline goes to the Caribbean to find out more about her European ancestry:

"Perhaps my African descent - something of that runs through my veins but doesn't manifest itself in me. It's sort of hidden and suppressed and it's not evident."

She is delighted to be told by Dr Mark Shriver that she is as much as 28% European and 72% African, which is more than twice as European as the average person in the Motherland study. However when she confronts her ancestor's past at the plantation where her female slave ancestor was made pregnant by her European slave owning ancestor, Jacqueline is forced to re-examine how European she actually feels.

Motherland Conclusions

Motherland is a remarkable project for many reasons. It will challenge both individual identity and society's own understanding of race, colour and community.

A groundbreaking application of genetics has finally answered a question that history and genealogy have been examining for centuries. Armed by science, Mark, Beaula and Jacqueline go on genetic journeys which for the first time *can* reconnect them to their lost ancestry in ways that, 25 years ago, Alex Haley, author of *Roots*, could scarcely have imagined would ever be possible.

But in bringing together science, history and people, Motherland also raises fundamental questions about what genetics can tell us about who we really are.