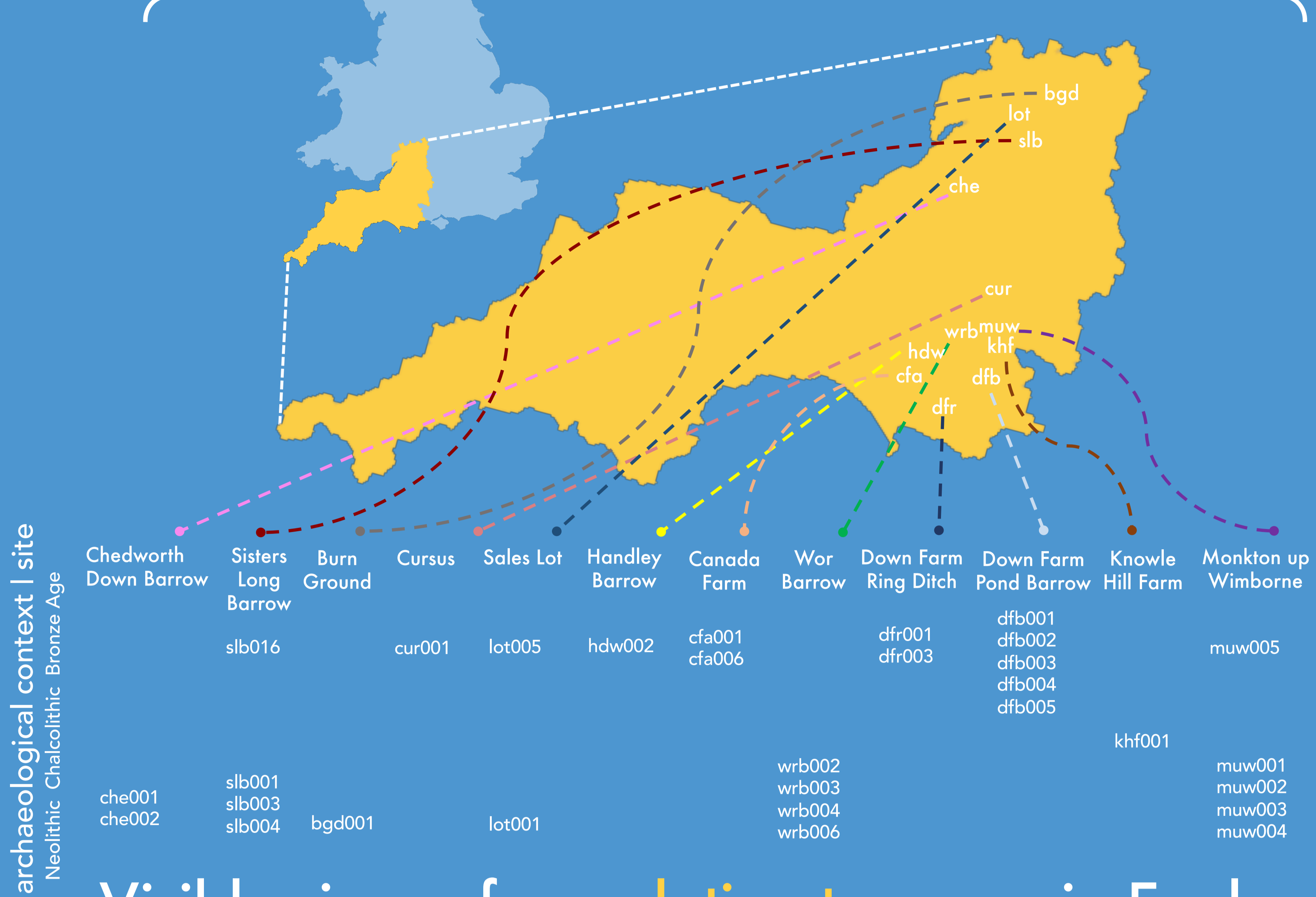


# Genomic analysis of ancient individuals from south-western England

Nikola Vukovic<sup>1</sup> Carolina Bernhardsson<sup>1</sup> Phillip Endicott<sup>1,2,4</sup> Gabrielle Delbarre<sup>3</sup> Martin Smith<sup>3</sup> Timothy Darvill<sup>3</sup> Martin Green<sup>5</sup> Mattias Jakobsson<sup>1</sup>  
 1 Uppsala University 2 University of Tartu 3 Bournemouth University 4 Natural History Museum of France 5 Down Farm Museum, Dorset, UK

## A WEST COUNTRY STORY



Neolithic Britons' sedentary lifestyle & **strong communal structure** are reflected in their funerary traditions (Fowler et al., 2022).

After the Bell Beaker migration into Britain (2400 - 2000 BCE), more than **90%** of the genetic composition of the **British Isles** is of **Yamnaya ancestry** (Olalde et al., 2018).

The main characteristics of the Bronze Age in Britain are the occurrence of distinctive bell-shaped beakers and a fundamentally **different approach to the burying of the dead**.

In contrast to the Neolithic, a **shift in focus to the individual**, rather than the ancestors as a collective is visible in the Bronze Age (McKinley et al., 1997).

Despite the shift in customs, **ancient barrows and burial mounds find continued use during the Bronze Age**, with smaller tombs often cut into the primary mounds.

We analysed **30 ancient individuals** from south-western England, excavated from different cultural contexts: **Neolithic (n=15)**, **Chalcolithic (n=1)** to the **Bronze Age (n=14)**.

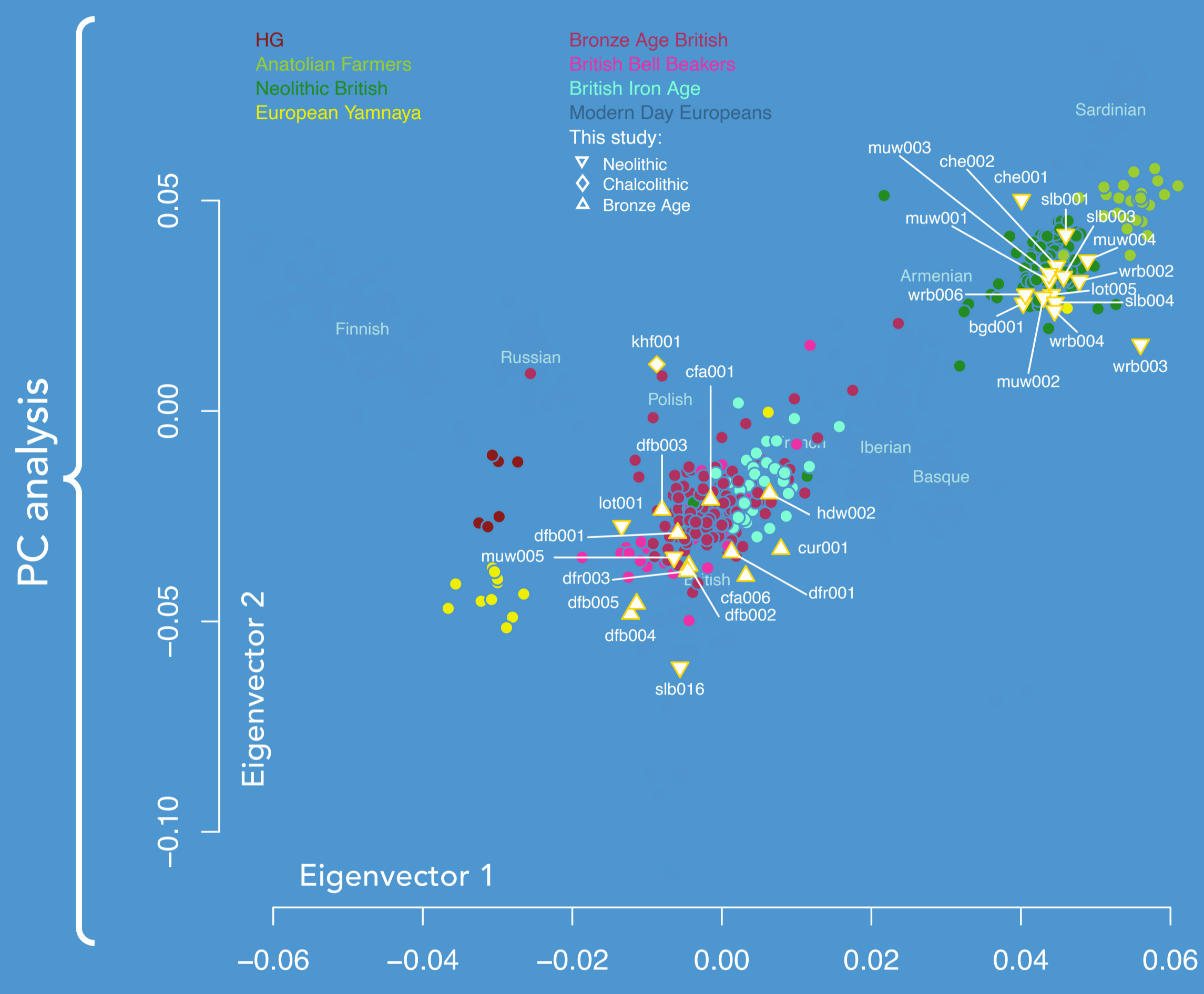
We find evidence of this **dramatic population turnover**.

In three instances we discover **Bronze Age Britons buried within Neolithic burial grounds**.

First **kin relationships** between four individuals provide a direct insight into the makeup of a Neolithic family.

By integrating genetic and archaeological analyses, our study delivers a snapshot of one of the most influential demographic shifts in British history, shedding light on both the **individual history** of these tombs as well as the **region's wider socio-cultural transformation**.

### Visible signs of **population turnover** in England after the Bell Beaker migration



Two distinct clusters are visible on the PCA plot:

- British Neolithic samples fall inside the range of variation of other European Neolithic populations
- British Bronze Age samples follow the broader European Bronze Age cluster.
- Anatolian Neolithic & Yamnaya occupy the extremes of the two clusters.

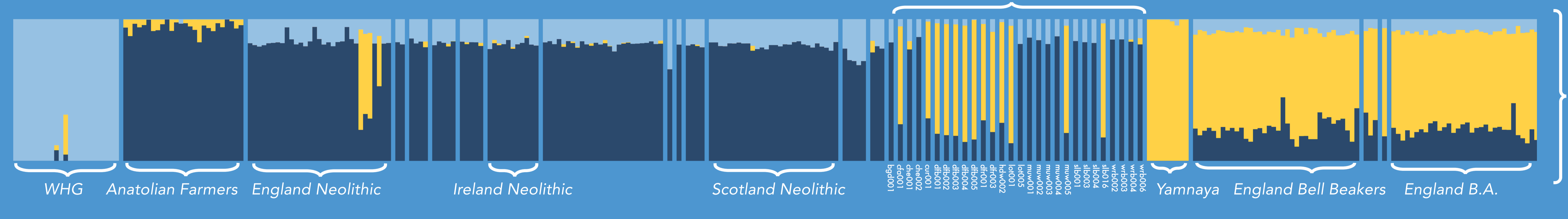
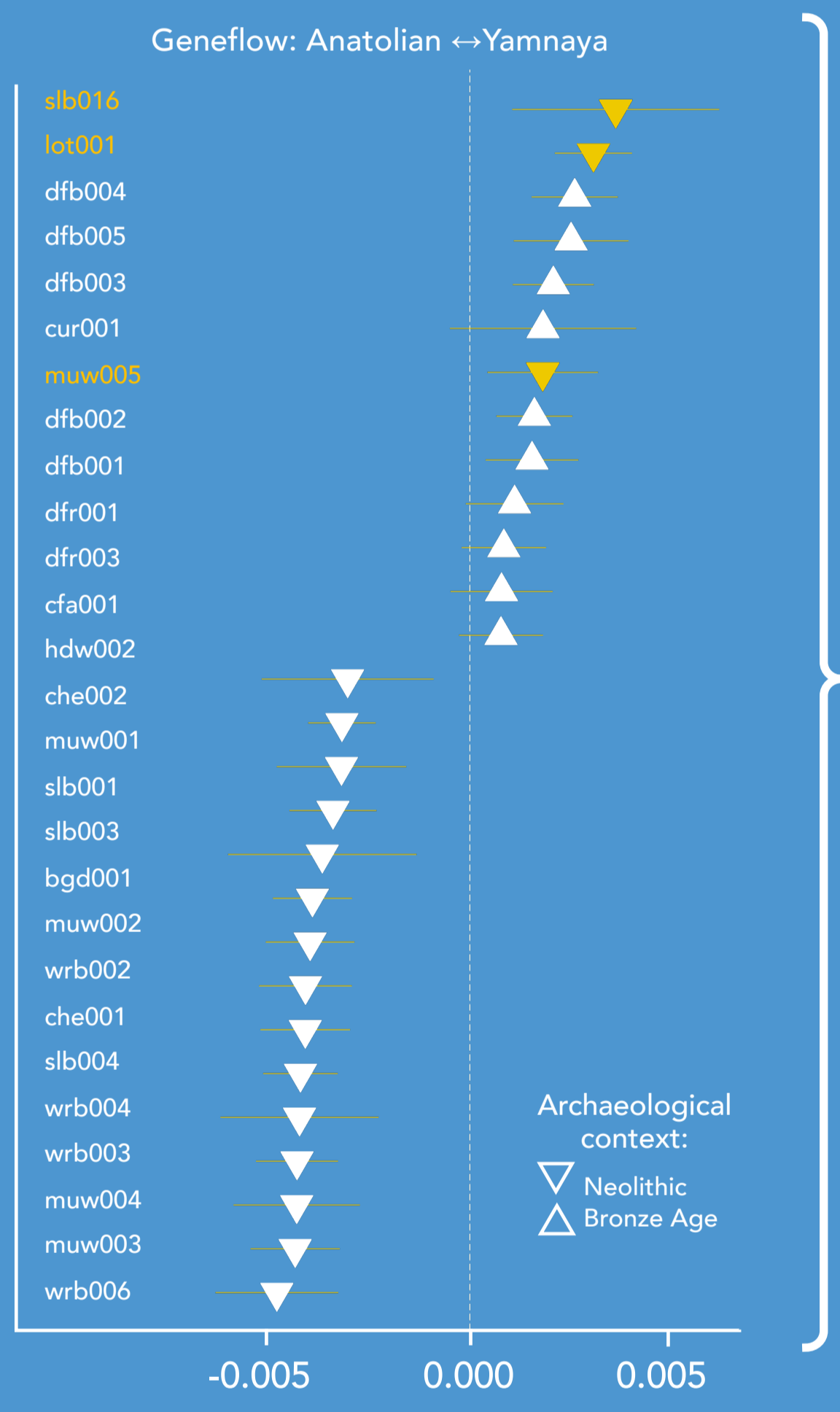
F4 statistics were employed to test for the differences in affinity between the British samples and two possible sources of gene flow (Neolithic Farmers & Yamnaya, respectively):

- The majority of **Neolithic individuals show significant positive Z values (Z>3)** while the **Bronze Age samples display significant negative Z values (<-3)**.
- An **exception** to this trend was observed in **three samples (slb016, lot001 & muw005)**, all of which exhibit a clear genetic affinity to the Yamnaya (<-3).

Admixture analysis reveals that the Neolithic samples share a large blue component common among Neolithic populations & a small grey component corresponding to the WHG populations.

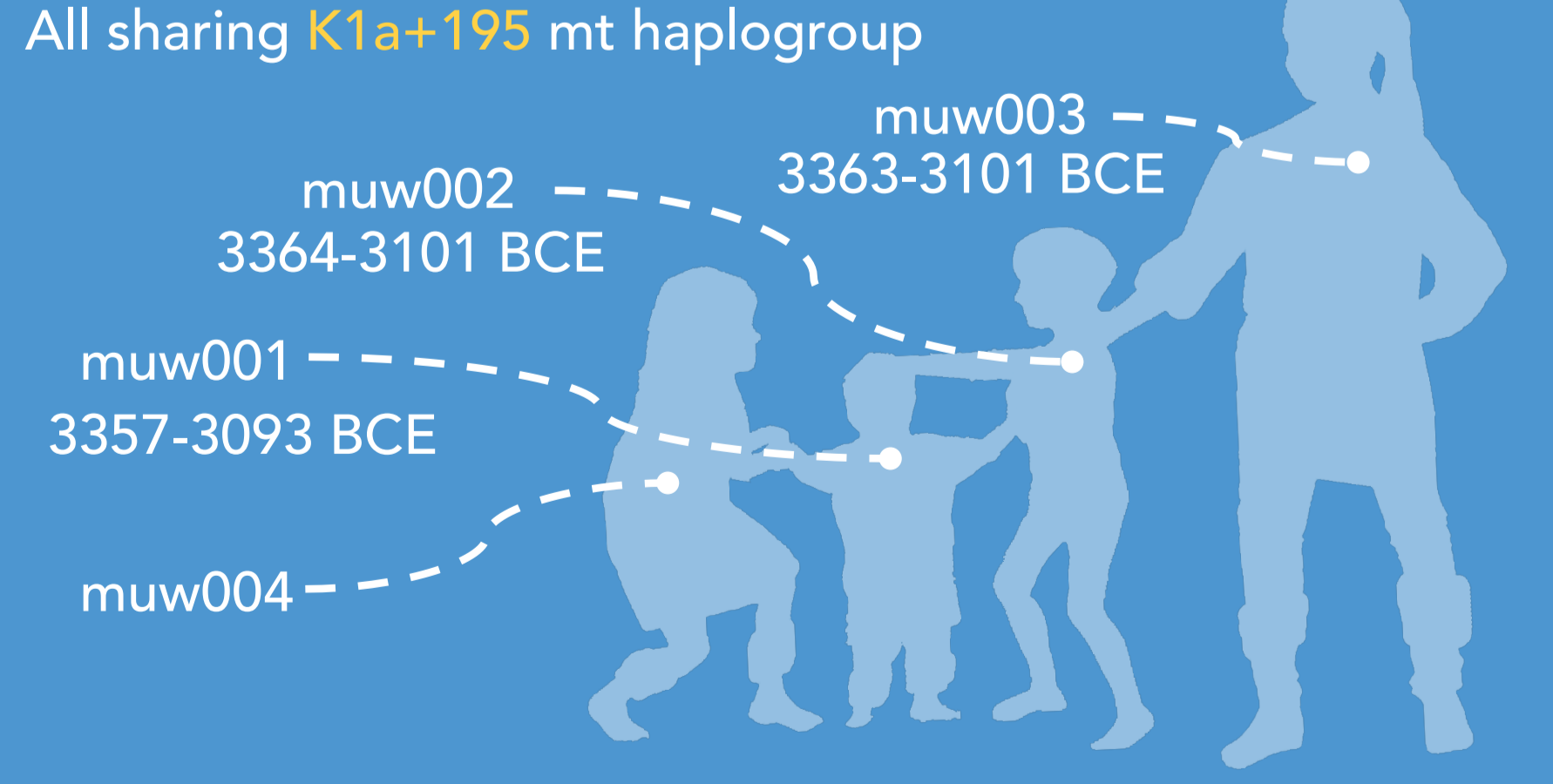
The Bronze Age samples consist of a **large yellow component**, present in the **Yamnaya** & smaller continental Neolithic and WHG components, similar to other Bronze Age populations in Europe as well as modern English individuals.

Despite evident signs of **admixture**, the distinct cluster patterns support a **history of population replacement and assimilation**.



### A Neolithic family tomb

Strong **kinship** between the **two male** and **two female** individuals at Monkton-up-Wimborne, suggesting a **Neolithic family burial site**.



### Possible tomb reuse?

**3 exceptions** to the "genetic makeup following the archeological context" rule. All exhibit very **high affinity to the Yamnaya source**. Different **haplogroups** than others in their burial sites:  
 ♀ **slb016** - H1ak1 mt haplogroup (rest are J/K)  
 ♂ **muw005** - H47 mt haplogroup (rest are K1a+195)  
 ♀ **lot001** - H6a16 mt haplogroup (lot005 is K1b1a1)

### Something to think about

Were the Bronze Age Britons paying attention to bury the dead at sites that **held significance** at more ancient times?  
 Maybe a way of showing **continuity** in island traditions?

### Bronze Age infant grave

At Down Farm Pond Barrow we discovered a burial site with **four Bronze Age infants**: **3 males and 1 female**.

### Bell Beaker Pioneer

a **female Bell Beaker** individual buried at a **Neolithic Long Barrow** burial 'Bronze Age' genetic profile  
**H6a16** mt haplogroup.  
**Very early radiocarbon date**  
 Potentially **one of the earliest Beaker burials in Britain**

### Found this interesting?

@nikolavvukovic nikola.vukovic@ebc.uu.se