

DNA Uncovers the Moment Humans Merged with Neanderthals

Description

The initial foray of modern Homo sapiens from Africa was not merely a venture into new territories but rather a pursuit following in the precedent of another human species that had previously undertaken this audacious journey.

Ultimately, our intrepid ancestors encountered their Neanderthal relatives, engaging in interactions that transcended mere acquaintance.

A recent genetic analysis of the earliest known remains of modern humans uncovered in Ranis, Germany, and Zlatý k??, Czech Republic, indicates that emigrant *Homo sapiens* and *Homo neanderthalensis* intermingled between 45,000 and 49,000 years ago. This research, conducted by Max Planck Institute anthropologist Arev Sümer and an international consortium, provides more recent estimates than those put forth in prior studies.

In contemporary terms, all humans, aside from those exclusively of African descent, exhibit the genetic imprints of these ancient unions within their DNA. The study suggests that this genetic interchange occurred approximately 80 generations prior to the births of the individuals analyzed, supporting previous hypotheses that such interactions likely transpired multiple times.

The researchers elucidate, "Our analyses indicate that the Zlatý k??/Ranis population diverged early from the lineage of other non-African groups, leaving no direct descendants among modern populations."

Furthermore, they posit that the Neanderthal genetic contributions carried by these early modern humans might have originated from separate occurrences distinct from those that contributed to the Neanderthal DNA found in present-day non-African populations.

The genomic analysis of six individuals from Ranis, dating back approximately 45,000 years, revealed a surprising genetic kinship between Zlatý k?? and two Ranis individuals, suggesting they were part of an extended familial network and likely engaged in similar tool-making practices.

These genomic revelations afford profound insights into the earliest pioneers who settled in Europe, intimating that any modern human remains older than 50,000 years discovered outside Africa could not conceivably belong to the shared ancestry that interbred with Neanderthals, which is now prevalent across vast areas of the globe.

Additionally, a second study analyzing 300 human genomes from the last 50,000 years indicates that the majority of our Neanderthal genetic heritage was integrated during a significant period between 50,500 and 43,500 years ago, potentially involving a distinct migratory wave inclusive of our direct ancestors.

These findings, disseminated in esteemed journals <u>Nature</u> and <u>Science</u>, constitute a pivotal advancement in the understanding of our species' complex history.



Vocabulary List:

- 1. Foray /'fo:.reɪ/ (noun): A venture into a new territory especially for exploration or expansion.
- 2. Intrepid /In'trep.Id/ (adjective): Fearless; adventurous.
- 3. **Intermingled** / Inter'mingeld/ (verb): To mix or mingle together.
- 4. Elucidate /I'lu:.si.deit/ (verb): To make something clear or easy to understand.
- 5. Heritage /'hɛrɪtɪdʒ/ (noun): Property that is or may be inherited; a special or individual possession.
- 6. **Contributions** /,kpntrr'bju:ʃənz/ (noun): The act of giving or doing something for a common purpose.

Comprehension Questions

Multiple Choice

1. When did the genetic intermingling between Homo sapiens and Homo neanderthalensis take place?

Option: Between 45,000 and 49,000 years ago

Option: Over 50,000 years ago Option: Around 40,000 years ago Option: Less than 30,000 years ago

2. Where were the earliest known remains of modern humans uncovered during the genetic analysis?

Option: Ranis, Germany and Zlatý k??, Czech Republic

Option: Sahara Desert, Africa

Option: Amazon Rainforest, South America

Option: Australian Outback

3. According to the researchers, did the Zlatý k??/Ranis population have direct descendants among modern populations?

Option: No, they did not have direct descendants

Option: Yes, they had direct descendants

Option: It is not mentioned Option: They were not sure

4. Where were the genomic analyses conducted on six individuals from Ranis?

Option: Around 45,000 years ago

Option: Approximately 50,000 years ago



Option: Less than 30,000 years ago Option: Around 60,000 years ago

5. When was the majority of Neanderthal genetic heritage integrated according to the second study mentioned?

Option: Between 50,500 and 43,500 years ago

Option: Less than 40,000 years ago Option: Over 55,000 years ago Option: Around 48,000 years ago

6. What did the researchers conclude about the Neanderthal genetic contributions carried by early modern humans in relation to present-day non-African populations?

Option: They originated from separate occurrences

Option: They had no relation to Neanderthals

Option: They were identical to present-day contributions

Option: It is not mentioned

True-False

- 7. All humans, except those of African descent, exhibit genetic imprints of ancient unions with Neanderthals in their DNA.
- 8. The genomic analysis of six individuals from Ranis revealed no genetic kinship between Zlatý k?? and the two Ranis individuals.
- 9. The shared ancestry that interbred with Neanderthals is present in all modern human remains older than 50,000 years discovered outside Africa.
- 10. The second study analyzed 300 human genomes from the last 40,000 years.
- 11. The genetic interchange between Homo sapiens and Homo neanderthalensis occurred over 60 generations prior to the births of the analyzed individuals.
- 12. The researchers did not find evidence supporting multiple genetic interchanges between Homo sapiens and Neanderthals.

Gap-Fill

13. The genetic interchange between emigrant Homo sapiens and Homo neanderthalensis occurred



approximately years ago.		
14. The Zlatý k??/Ranis population diverged early from the lineage of other non-African groups, leaving no		
direct descendants among modern populations. This divergence happened before the births of the		
individuals analyzed, which were approximately years ago.		
15. The majority of our Neanderthal genetic heritage was integrated during a significant period between		
years ago, potentially involving a distinct migratory wave inclusive of our direct		
ancestors.		
16. The genomic analysis of six individuals from Ranis, dating back approximately 45,000 years, revealed a		
surprising genetic kinship between Zlatý k?? and two Ranis individuals, suggesting they were part of an		
extended familial network and likely engaged in similar practices.		
17. The findings from the genetic analysis suggest that any modern human remains older than		
years discovered outside Africa could not conceivably belong to the shared		
ancestry that interbred with Neanderthals.		
18. The researchers concluded that the Neanderthal genetic contributions carried by early modern humans		
might have originated from separate occurrences distinct from those that contributed to the Neanderthal		
DNA found in present-day non-African populations, suggesting interactions likely		
transpired multiple times.		

Answer

Multiple Choice: 1. Between 45,000 and 49,000 years ago 2. Ranis, Germany and Zlatý k??, Czech Republic 3. No, they did not have direct descendants 4. Around 45,000 years ago 5. Between 50,500 and 43,500 years ago 6. They originated from separate occurrences

True-False: 7. True 8. False 9. False 10. False 11. False 12. False

Gap-Fill: 13. 45,000 and 49,000 14. 80 generations 15. 50,500 and 43,500 16. tool-making 17. 50,000 18. such



Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which term refers to the proportion of a particular disease or condition in a population at a specific time?

Option: Prevalence Option: Adherence Option: Resilience Option: Heritage

2. Which term describes the body's response to injury or infection characterized by redness swelling and pain?

Option: Adaptability
Option: Inflammation
Option: Thermal
Option: Genomic

3. What term refers to how well a patient follows medical advice and takes prescribed treatments?

Option: Contributions
Option: Adherence
Option: Cognitive
Option: Corroborate

4. Which term means the act of leaving out or not including someone or something?

Option: Contaminants
Option: Exclusion
Option: Divergence
Option: Elucidate

5. Which term refers to the capacity to recover quickly from difficulties and setbacks?

Option: Manifestations

Option: Intrepid
Option: Resilience
Option: Cosmology

6. What term relates to the complete set of genes or genetic material present in a cell or organism?

Option: Correlate
Option: Genomic
Option: Manifestations



Option: Divergence

7. Which term describes a sudden and violent event with harmful effects?

Option: Inflationary Option: Preservation Option: Cataclysmic Option: Thermal

8. What term means the process of separating and going in different directions?

Option: Contaminants

Option: Intrepid
Option: Lexicons
Option: Divergence

9. Which term refers to the display or demonstration of a particular action or object?

Option: Cosmology Option: Preservation Option: Contaminants Option: Manifestations

10. What term means to confirm or give support to a statement theory or finding?

Option: Intrepid
Option: Corroborate

Option: Corroborate
Option: Intermingled
Option: Meticulous

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11	diseases are characterized by the progressive degeneration of the structure	
and function of the nervous system.		
12	is the ability to adjust to new conditions or environmental changes.	
13	is the study of the origin evolution and eventual fate of the universe.	
14	energy is energy derived from heat.	
15	are substances that make something impure by adding harmful or unwanted	
elements.		



16. An explorer fearlessly embarks on dangerous or unknown journeys.		
17. The professor sought to complex scientific concepts for the students.		
18. The team acknowledged the valuable made by each member to the project.		
19. Preserving cultural is essential for passing down traditions to future		
generations.		
20. Scientists aim to different variables to understand their relationship.		
Matching Sentences (Match each definition to the correct word from the vocabulary list.)		
21. The mystery novel had a plot full of twists and turns that kept readers engaged.		
22. of historical sites is crucial to maintain their cultural significance.		
23. can be harmful if not properly shielded against in certain environments.		
24. She was known for her attention to detail in every aspect of her work.		
25. Different cultures have unique that reflect their language and history.		
26. explores the nature of the universe including its origin and development.		
27. The flavors of the spices were so well that it created a delicious blend.		
28. development in children involves processes such as thinking learning and problem-solving.		
29. An economy experiences a rapid increase in prices.		
30. Her elegant posture and graceful movements were the of sophistication.		

Answer

Multiple Choice: 1. Prevalence 2. Inflammation 3. Adherence 4. Exclusion 5. Resilience 6. Genomic

7. Cataclysmic 8. Divergence 9. Manifestations 10. Corroborate

Gap-Fill: 11. Neurodegenerative 12. Adaptability 13. Cosmology 14. Thermal 15. Contaminants 16. Intrepid

17. Elucidate 18. Contributions 19. heritage 20. Correlate

Matching sentence: 1. Intriguing 2. Preservation 3. Radiation 4. Meticulous 5. Lexicons 6. Cosmology

7. Intermingled



8. Cognitive 9. Inflationary 10. Embodiment

CATEGORY

1. Health - LEVEL6

Date Created 2024/12/13 **Author** aimeeyoung99

