



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 S?mer 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 [Nature](#) and [Science](#), constitute a pivotal advancement in the understanding of our species' complex history.



Vocabulary List:

1. **Foray** /'fɔːreɪ/ (noun): A venture into a new territory especially for exploration or expansion.
2. **Intrepid** /ɪn'trepɪd/ (adjective): Fearless; adventurous.
3. **Intermingled** /,ɪntər'mɪŋɡəld/ (verb): To mix or mingle together.
4. **Elucidate** /ɪ'luːsɪ.deɪt/ (verb): To make something clear or easy to understand.
5. **Heritage** /'herɪtɪdʒ/ (noun): Property that is or may be inherited; a special or individual possession.
6. **Contributions** /,kɒntrɪ'bjuːʃənz/ (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 kůň, Czech Republic
Option: Sahara Desert, Africa
Option: Amazon Rainforest, South America
Option: Australian Outback
3. According to the researchers, did the Zlatý kůň/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: 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

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