

Name: _____

Dr. Reichler's Bio 325-uex Spring 2009 Quiz 4/30

- 1) Would an individual's age be a good measure of their evolutionary success?
- 2) Would differences in non-coding mtDNA be subjected to natural selection or genetic drift?
- 3) What would we know about 2 people who had the same mitochondrial DNA?
- 4) Which hypothesis about the origin of *H. sapiens* is eliminated by the mitochondrial DNA data?
- 5) What different conclusion can be reached from looking at the human mitochondrial DNA data as populations versus as individuals?
- 6) What do we know about human migration by looking at the distribution of current DNA?
- 7) Why are some Neanderthal fossils inappropriate for collecting data about their DNA?
- 8) What evidence indicates that Neanderthals and humans did not interbreed? What happened to the Neanderthals?
- 9) How was the lack of successful PCR used to show differences between Neanderthals and humans?
- 10) What can explain two species that are not very closely related, but have the a gene with the same sequence?

Answers:

- 1) No, reproduction is the key to evolutionary success.
- 2) Genetic drift since the non-coding region does not code for a trait, it would not be subject to natural selection.
- 3) They shared a common ancestor within the last ~10,000 years.
- 4) The multiregional hypothesis. The mtDNA says all humans shared a common ancestor about 150,000 years ago, and the multiregional hypothesis says that we had a common ancestor over 1 million years ago.
- 5) The population data shows a correlation between geographi and genetic distance. The individual data shows that many individuals do not fit this correlation.
- 6) Humans have been constantly migrating throughout our history.
- 7) The DNA may be degraded and/or highly contaminated with modern human DNA.
- 8) No Neanderthal mtDNA sequences have been identified in humans. They went extinct.
- 9) The human specific primers would amplify from many different samples indicating contamination from the handling of the samples, but the Neanderthal specific primers only amplified DNA from fossils identified as Neanderthal.
- 10) Horizontal gene transfer.