The discovery of the "Skipping Generations" phenomenon

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Statement of the Problem: The demanding need to discover someone's identity is not possible with the nuclear DNA especially when the traces are highly degraded, since the nuclear DNA is destroyed in these conditions. Only the mitochondrial DNA that is inherited maternally can survive in these compromised conditions. The purpose of this study is to find a genetic commonality between UAE nationals.

Methodology & Theoretical Orientation: 150 buccal swabs of unrelated UAE female students (approved by the UAE ID) of Sharjah Higher Colleges of Technology were collected and kept at room temperature for a period of three months or longer; to destroy the nuclear DNA, so only the mtDNA is present. mtDNA testing was performed on these buccal swabs, and it is consisting of DNA extraction, Real-Time quantitative PCR, cycle sequencing and capillary electrophoresis. The ABI PRISM®310 Genetic Analyzer capillary autosequencer [ABI PRISM® SeqScape® Software Version 2.6] was used to generate the mitochondrial DNA profiles.

Findings: From these haplotype data, a total of 229 polymorphisms were observed carefully. 106 different polymorphisms were identified out of them and classified into unique and common polymorphisms. Interestingly, two individuals from the study subjects lacked unique polymorphisms.

Conclusion & Significance: It is impossible for anyone to preserve their mtDNA from their great ancestors till now. The discovery of the remains of the Romanov family back in 1991concluded that the comparison of mtDNA that is more than three generations old is more likely to get at least one mutation in the current generation. Therefore, if a vertical study is done on those two individuals with their older generations, definitely they will have unique polymorphisms compared to their older generations. Those two individuals are the effect of skipping generation's phenomenon; the term that I have invented to solve the mystery of having two individuals with no unique polymorphisms.

Biography

Mouza Mohammed AlFashti AlAleeli has received her Bachelor's degree in Medical Laboratory Science from Sharjah Higher Colleges of Technology, UAE. She has worked for the Ministry of Presidential Affairs as a Medical Laboratory Scientist at Sheikh Khalifa General Hospital in Ajman, UAE. She is currently a Member of the Infection Prevention and Control Committee of Sheikh Khalifa Medical City Ajman and a Member of the laboratory quality team of Sheikh Khalifa Medical City Ajman. She had an experience of five months working on mitochondrial DNA testing in the police forensic laboratory in Sharjah, UAE. Her current research "The significance of applying mitochondrial DNA testing in degraded biological evidence for the identification of UAE nationals to aid in forensic analysis" leads her to discover the "Skipping Generations" phenomenon.

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