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Evaluation of the “ETHNITEST” as a basic genetic tool in the assessment of ethnic origin for forensic and medical applications

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In the investigation of criminal cases recent applications of DNA-based methodologies for inferring genetic ethnicity are established. A sizable number of human diseases and the efficacy of therapeutic drugs' have been linked to ethnic backgrounds. Such racially-related diseases and drug responders included cardiovascular disorders, sickle cell anemia, breast cancer, prostate cancer and responders to the therapeutic agent BiDil for treating congestive heart failures. Surprisingly, no DNA based ethnicity method was exploited to verify the assumed link. To this end, we have developed a logarithmic method utilizing the disease free STR genetic markers, which demonstrated the suitability to separate between the two entities. The developed software system is currently used by our laboratory under the commercial name “Ethnitest” for inferring genetic ethnic composition in racially admixture- individuals. The assay demonstrated low error rates and accommodated up to ten population groups with distinct apportioned-admixture probabilities. Among self-claimed African American, Caucasian, Asian and Hispanic American populations, the assay demonstrated that 20%, 35%, 55% and 95% are respectively admixtures. Upon further investigations, self-claimed Hispanic populations from three different geographical regions (North, Central and South America) showed invariably different admixtures. Major constituents of these admixtures were found to be Native Americans and Europeans. In contrast, self-claimed Africans showed minimal admixtures among West African populations. However, East African populations showed different admixtures with African, Asian and Middle Eastern as dominant ethnicities. Composition of the North Africans revealed the dominance by European and Middle Eastern. Impact of findings on disease disparity and personalized medicine will be discussed.

Biography

M AL Salih has BVSC (Veterinary Medicine), MT (ASCP-Blood Bank), MS, PhD degrees. Currently he is President, Medical Laboratory Director & Forensic Technical Leader of the DNA Reference Lab, Inc. He did his BVSC (Khartoum University), MS and PhD (Microbiology, Oregon State University), MT (Blood Bank and Transfusion Medicine, UTHSCSA). He is serving as supervising pathology faculty and is involved in graduate medical education of medical residents/fellows in transfusion medicine at UTHSCSA. In 1997, he pioneered the build-up of an accredited DNA testing facility for forensic, relationship and molecular diagnostic testing in San Antonio, Texas. He is an expert witness who testified on several high-profile forensic cases in US courts.

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