Journal of Genetics and Genetic Engineering
Volume 2, Issue 4, 2018, PP 7-8
ISSN 2637-5370

The DNA of Genetics

G. H. Sperber

Faculty of Medicine and Dentistry University of Alberta Edmonton, Alberta, T6G 1C9, Canada

***Corresponding Author:** G. H. Sperber, Faculty of Medicine and Dentistry University of Alberta Edmonton, Alberta, T6G 1C9, Canada*

ABSTRACT

A review of current publications featuring advances in genetics and their impact on genetic expressions of inheritance patterns, diseases, and evolutionary revelations. The dissection of complex traits and personal genetic familial relationships and endowments are explored.

Keywords: *DNA; Genetics; Inheritance; Forensics; Heredity.*

INTRODUCTION

The entry into common everyday language of the acronym "DNA" of a concept or proposal is indicative of how much genetics has infiltrated the common body of knowledge of the general population. People speak of personal traits such as hair and eye color attributable to DNA and genes as if they are tangible entities. Interest in human heredity is as fundamental as the presumed similarity (or dissimilarity) of newborn babies to their parents.

LITERATURE REVIEW

The science of heredity was sparked by Mendel's experiments with peas, hence "Mendelian inheritance". Francis Galton's preaching of planning human breeding by the eugenics movement initiated the popular interest in genetics. The association of the beginnings of genetics with Mendel's snug little pea pods to the current soaring spirals of DNA double helix has led to our exploring the biochemical basis of our existence, our behavior, and our procreation possibilities. All these encompass our current fascination with our genesis and evolution.

Genetics and genomics have always implicated race, intelligence, inheritance, medicine and is now expanding into social policies and international relations with implications for the future of human society. (1, 2) The advent of cheap genotyping services like "23 and me" presuming to provide insightful information on what our genes may hold in store for ourselves and our offspring holds consequences for human evolution. (3) Meanwhile, clinical genetic sequencing services data can provide meaningful clinical information. (4) Gene editing employed in Vitro Fertilization (IVF) techniques to produce "designer" babies looms in the future. The application of the technique involves no deaths, no sterilizations and no abortions to provide for the betterment of human society . The Francis Crick Institute in London has been given authorization to employ the gene-editing technique known as CRISPR-Cas9.

Molecular interventions that extend the human health span and lifespan by identifying the mechanisms of ageing by DNA methylation data provide accurate age estimates for all tissues across the entire life course. These "epigenetic clocks" provide biological ageing and maintenance of tissues to address the fundamental question of why do we age? (5)

The field of archaeo genetics links the past and the present through the evidence provided by DNA. The revelation of the prehistoric female offspring of a Neanderthal mother and a Denisov an father was based on the genome extracted from a bone fragment. (6) By studying the DNA patterns of early hominins reveals the viral defenses enjoyed by modern humans. Neanderthal-human interbreeding allowed for the exchange of viruses and provided for the detection of ancient epidemics. (7) The results of these studies could provide insights into the incidence and distribution of epidemics of the past, present and future.An unusual source of DNA is the microbial DNA preserved in dental calculus that is prevalent in archaeological skeletal collections. (8) This resource of ancient DNA provides an excellent record of the human oral microbiome, and thereby can be indicative of ancient palaeodiets. (9)

CONCLUSION

The extraction of information from DNA analyses provides an incalculable insight into the past, present and possible futures of humankind.

The origins of Homo from Australopithecines can ostensibly be traced through genetics as the lifeline of human evolution (10).Attempts to link genetics with racial classifications has been denounced by the American Society of Human Genetics (11). The possible potential to perform prenatal diagnoses and intra-uterine prenatal genomic surgery and genetic engineering to prevent malformations occurring in the developing fetus is a looming reality. (12).There is more yet to come.

REFERENCES

[1] Conley D, Fletcher J. The Genome Factor: What the Social Genomics Revolution Reveals about Ourselves, Our History and the Future. Princeton University Press. Princeton. 2017. 295 p.

[2] Porter T. Genetics in the Madhouse: the Unknown History of Human Heredity. Princeton University Press. Princeton. 2018. 464 p.

[3] 23and me [Internet]. Mountain View, CA. 2018. [2018/11/05]. Available from :https://store23andme.com

[4] Eisenstein M. The Clinical Code-breakers. Nature. 2018. 562:291-293.doi:10.1038/d41586-018-06958-1.

[5] Horvath S, Raj K. DNA Methylation-based Biomarkersand the Epigenetic Clock Theory of Ageing. Nat. Rev. Genet. 2018. 19:371-384.doi: 10.1038/s41576-018-0004-3.

[6] Slon V, Mafessoni F, Vernot B, de Filippo C, Grote S, Viola B, et al. The Genome of the Offspring of a Neanderthal Mother and a Denisovan Father. *Nature*. 2018. 561: 113-116. doi:10.1038/s41586-018-0455-x

[7] Enard D, Petrov D. Evidence that RNA Viruses Drove Adaptive Introgression Between Neanderthals and Modern Humans. *Cell*. 175 (2018): 360-371. doi:10.1016/j.cell.2018.08.034

[8] Mann AE, Sabin S, Ziesemer K, Vagene A, Schroeder H, Ozga A, et al. Differential Preservation of Endogenous Human and Microbiological DNA in Dental Calculus and Dentin. *Sci Rep*.2018. 8; Article 9822. doi:10.1038/s41598-018-28091-9.

[9] Price SDR, Schwarcz HP, Keenleyside A. Testing the Validity of Stable Isotope Analyses of Dental Calculus as a Proxy in Paleodietary Studies. *J. Archaeol. Sci*. 2018. 91: 92-103. doi:10.1016/j.jas.2018.01.008

[10] Maxmen A. Rare genetic sequences illuminate early humans' history in Africa. Nature 2018. 563:13-14.

[11] ASHG Perspective. Am J Hum Genet 2018. 103:636.

[12] Habal MB. Genomic Surgery: Through the Translational Looking GlassFrom Science Fiction to Reality. J. Craniofac. Surg. 2018. 29:2007-2008. doi: 10.1097/SCS.0000000000005145.

Citation: *G. H. Sperber." The DNA of Genetics",Journal of Genetics and Genetic Engineering, vol. 2, no. 4, pp. 7-8,2018.*