

Abstract

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The Genome Health Clinic and Genome Health Nutrigenomics concepts: diagnosis and nutritional treatment of genome and epigenome damage on an individual basis.

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BACKGROUND: The evidence of a direct link between increased genome/epigenome damage and elevated risk for adverse health outcomes during the various stages of life, such as infertility, foetal development and cancer is becoming increasingly stronger.

DISCUSSION: The latter is briefly reviewed against a background of evidence indicating that genome and epigenome damage biomarkers, in the absence of overt exposure of genotoxins, are themselves sensitive indicators of deficiency in micronutrients required as cofactors or as components of DNA repair enzymes, for maintenance methylation of CpG sequences and prevention of DNA oxidation and/or uracil incorporation into DNA. The latter is illustrated with cross-sectional and dietary intervention data obtained using the micronucleus assay and other efficient biomarkers for diagnosing genome and/or epigenome instability. The concept of recommended dietary allowances for genome stability and how this could be achieved is discussed. The 'Genome Health Nutrigenomics' concept is also introduced to define and focus attention on the specialized research area of how diet impacts on genome stability and how genotype determines nutritional requirements for genome health maintenance.

CONCLUSION: The review concludes with a vision for a paradigm shift in disease prevention strategy based on the diagnosis and nutritional treatment of genome/epigenome damage on an individual basis, i.e. The Genome Health Clinic.

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