

Abstract

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Genome-health nutrigenomics and nutrigenetics: nutritional requirements or 'nutriomes' for chromosomal stability and telomere maintenance at the individual level.

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BACKGROUND: It is becoming increasingly evident that (a) risk for developmental and degenerative disease increases with more DNA damage, which in turn is dependent on nutritional status, and (b) the optimal concentration of micronutrients for prevention of genome damage is also dependent on genetic polymorphisms that alter the function of genes involved directly or indirectly in the uptake and metabolism of micronutrients required for DNA repair and DNA replication.

DISCUSSION: The development of dietary patterns, functional foods and supplements that are designed to improve genome-health maintenance in individuals with specific genetic backgrounds may provide an important contribution to an optimum health strategy based on the diagnosis and individualised nutritional prevention of genome damage, i.e. genome health clinics.

SUMMARY: The present review summarises some of the recent knowledge relating to micronutrients that are associated with chromosomal stability and provides some initial insights into the likely nutritional factors that may be expected to have an impact on the maintenance of telomeres.

CONCLUSION: It is evident that developing effective strategies for defining nutrient doses and combinations or 'nutriomes' for genome-health maintenance at the individual level is essential for further progress in this research field.

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