

# Abstract

Forum Nutr. 2007;60:49-65.

## Nutrition and genome health.

Fenech M.

CSIRO Human Nutrition, Adelaide, Australia.

**BACKGROUND:** The link between genome damage and adverse health outcomes is compelling. There is increasing evidence indicating that genome instability, in the absence of overt exposure to genotoxins, is itself a sensitive marker of nutritional deficiency.

**FINDINGS:** We have shown that above average intake of certain micronutrients (i.e. calcium, vitamin E, retinol, folate, vitamin B12 and nicotinic acid) is associated with a reduced genome damage rate measured using the micronucleus assay. Genome health nutrigenomics is an emerging and important new field of nutritional science because it is increasingly evident that optimal concentration of micronutrients for the prevention of genome damage is dependent on genetic polymorphisms that alter the function of genes involved directly or indirectly in DNA repair and metabolism. Essentially this also means that the dietary 'nutriome' (i.e. nutrient profile and composition) recommendations should be matched to an individual's functional genome to optimise genome health maintenance.

**CONCLUSIONS:** Development of functional foods and dietary patterns that are specifically designed to improve genome health maintenance in humans with specific genetic backgrounds are expected to provide an important contribution to a new health strategy based on the diagnosis and individualised nutritional treatment of genome instability (i.e. Genome Health Clinics).

PMID: 17684401