

Nutritional Genomics, DNA Damage Diagnostics and Prevention (CSIRO Human Nutrition)

Supervisors: Dr Nathan O'Callaghan, Prof Michael Fenech

Short description of projects offered for 2010:

Various Honours, Masters and PhD projects focused on diagnostics and dietary prevention of accelerated telomere shortening and telomere dysfunction. These projects aim to:

1. Develop novel and better techniques for measuring damage to telomeres on chromosomes in accessible human tissue.
2. To identify which nutrients and dietary patterns are essential for telomere length maintenance *in vivo*.
3. To define nutritionally optimal culture media for prevention of damage to the telomeres of cultured adult human stem cells.

Key references:

- 1 Title: [An increased micronucleus frequency in peripheral blood lymphocytes predicts the risk of cancer in humans](#) Author(s): Bonassi S, Znaor A, Ceppi M, et al. **CARCINOGENESIS** Volume: **28** Issue: **3** Pages: **625-631** Published: **MAR 2007**
- 2 Title: [Methylenetetrahydrofolate reductase C677T polymorphism, folic acid and riboflavin are important determinants of genome stability in cultured human lymphocytes](#) Author(s): Kimura M, Umegaki K, Higuchi M, et al. **JOURNAL OF NUTRITION** Volume: **134** Issue: **1** Pages: **48-56** Published: **JAN 2004**
- 3 Title: [Cytokinesis-block micronucleus cytome assay](#) Author(s): Fenech M **NATURE PROTOCOLS** Volume: **2** Issue: **5** Pages: **1084-1104** Published: **2007**
- 4 Title: [The Genome Health Clinic and Genome Health Nutrigenomics concepts: diagnosis and nutritional treatment of genome and epigenome damage on an individual basis](#) Author(s): Fenech M **MUTAGENESIS** Volume: **20** Issue: **4** Pages: **255-269** Published: **JUL 2005**
- 5 Title: [A quantitative real-time PCR method for absolute telomere length](#) Author(s): O'Callaghan NJ, Dhillon VS, Thomas P and Fenech M. **BIOTECHNIQUES** Volume: **44** Issue: **6** Pages: **807-809** Published: **MAY 2008**