## P51 Screening of plant-based extracts for colorectal cancer prevention

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**Background** – Colorectal cancer (CRC) is the second ranked cause of cancer related death in Australia. A healthy lifestyle based on a good diet is the most attractive preventative strategy to fight this disease. Dietary fruits, vegetables, legumes and cereals are recommended for the prevention of CRC development. It is desirable to know which particular foods posses specific anticancer properties. From our research, several plant-derived products with anticancer properties have been identified and found to protect at different stages of the complex process of carcinogenesis.

**Objective** – The objective was to identify dietary plant sources with anti-proliferative and apoptotic properties against HT-29 colon cancer cells.

**Design** – Aqueous-ethanolic extracts of edible part of plants, nuts and herbs were tested in exponentially growing HT-29 cells in 96 well plates using the cell titre blue (CTB) assay. Lead samples with anti-proliferative activity were then further tested for their specific effects on apoptosis, histone deacetylase (HDAC) activity, cell cycle phase, and expression of cyclooxygenases (COX) and enzymes implicated in CRC such as quinone reductase and glutathione synthase transferase (GST).

**Outcomes** – Salicylate at 10 mM inhibited the growth of HT-29 cells up to 55% with no effect on apoptosis, conversely butyrate at 10 mM inhibited the growth of HT-29 cells at about 30% and induced apoptosis up to 25%. We found several plant genera including rosemary, chives, bay leaves, coriander, basil, cardamom and cloves demonstrated anti-proliferative and apoptotic activity comparable to salicylate and butyrate and altered activity and expression of key enzymes linked to CRC development.

**Conclusion** – We have identified leads from food extracts with potential anticancer properties. We intend to further validate these lead extracts in animal models of CRC to develop functional foods and nutraceutical products that might prevent the development of human CRC.

## P52 Chickpeas influence P:S ratio and fibre content of ad libitum dietary intake and improve serum lipid profile, and glycaemic control

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**Background** – There has been a gradual development of interest in the contribution of pulses to a healthy lifestyle, as awareness of ethnic diets and lifestyles has grown. A couple of controlled dietary intervention studies with chickpeas have shown a small but significant reduction in serum low density lipoprotein (LDL-C) and total cholesterol (TC) concentrations in women and men. But a question remains as to the potential effect of chickpeas on nutrient intake, metabolic and physiological changes in a more realistic ad libitum setting.

**Objective** – To estimate the effect of including a realistic quantity of chickpeas in an otherwise ad libitum diet in free-living adults.

**Design** – An ordered crossover design of 20 weeks duration with four weeks of habitual diet at commencement and end. Forty-five adult women and men, as a group slightly hypercholesterolaemic but normoglycaemic, included 104g of chickpeas per day in their habitual diet for 12 weeks. Comparison was made of macronutrient and dietary fibre consumption, body mass index, fasting plasma glucose, serum lipids, lipoproteins, insulin, leptin and ghrelin concentrations, after habitual diet supplemented with chickpeas and after four weeks of post chickpea ad libitum diet. Semi-quantitative assessment of bowel function was made using anchored visual analogue scales. All data was analysed with repeated measures ANOVA using GLM with robust standard error estimation and ordinal logistic regression for ordinal data.

**Outcomes** – Chickpea-related increases in mean dietary fibre and PUFA intake were associated with significant decreases in serum TC and LDL-C, fasting insulin and HOMA-IR (p<0.05 for all) when compared to the usual dietary phase. Small but significant reductions in body weight (p=0.001) and improved bowel function were noted during the chickpea phase compared to the usual dietary phase.

**Conclusion** – Adding chickpeas to the diet is a sensible option for individuals wanting to modify their diet-associated CVD risk factors.