

# 4<sup>th</sup> Global Summit on **Toxicology**

**August 24-26, 2015 Philadelphia, USA**

## **The protective effect of the flavonoids on food-mutagen-induced DNA damage in peripheral blood lymphocytes from colon cancer patients**

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The food mutagens IQ (2-amino-3-methylimidazo [4,5-f]quinoline) and PhIP (2-amino-1-methyl-6-phenylimidazo [4,5-b] pyridine) are heterocyclic amines (HCA), generated when heating proteinaceous food. This study investigates the protective potential of the flavonoids quercetin (Q) and rutin (R) against oxidative stress induced *in vitro* by IQ and PhIP in lymphocytes from healthy individuals and untreated, newly diagnosed colon cancer patients using the Comet assay. In the presence of up to 500  $\mu\text{M}$  Q and R, the DNA damage resulting from a high dose of PhIP (75  $\mu\text{M}$ ) or IQ (150  $\mu\text{M}$ ) was significantly reduced ( $P < 0.001$ ) to levels comparable to six times lower IQ or 7.5 times lower PhIP doses. Lymphocytes from colon cancer patients had greater baseline DNA damage than those from healthy individuals ( $P < 0.01$ ) and this higher level of damage was also observed throughout *in vitro* treatment. Except for the >50 years of age group and male gender, confounding factors such as smoking, drinking and/or dietary habits were not found to be significant. In conclusion, flavonoids reduced oxidative stress caused by food mutagens *in vitro* in lymphocytes of healthy individuals and colon cancer patients. Thus, dietary supplementation with flavonoid-rich vegetables and fruits may prove very effective in protecting against oxidative stress.

### **Biography**

Diana Anderson holds the Established Chair in Biomedical Sciences at the University of Bradford. She obtained her first degree in the University of Wales and second degrees in the Faculty of Medicine, University of Manchester. She has over 450 peer-reviewed papers, 8 books, has successfully supervised 26 PhDs, and been an Editorial Boards Member of 10 international journals. She has been or is Editor in Chief of a book Series on toxicology for J. Wiley and sons and the Royal Society of Chemistry respectively. She gives key note addresses at various international meetings. She is a consultant for many international organisations, such as the WHO, NATO, TWAS, UNIDO and the OECD.

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