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**DNA damage protection by quercetin in isolated primary sertoli cells exposed to the food mutagen 2-amino-3-methylimidazo [4,5-f] quinolone(IQ) *in vitro***

Heterocyclic amines (HCAs) are mutagenic and carcinogenic chemicals generated by heating or processing of cooked foods. The main precursors of HCA formation are creatine/ creatinine found in muscle foods. Creatine supplementation has been associated with a number of adverse events, including cancer. In rodents, a study has suggested an increased risk of testicular germ cell cancer. The most common HCAs found in foods are the thermic HCAs, which include 2-amino-3-methyl-imidazo [4,5-3f] quinoline (IQ). Antioxidants are very important in order to protect the cells against oxidative damage. The present study explored the mechanism of cytotoxic and genotoxic effects of IQ in a primary culture of Sertoli cells also known as

“mother/nurse cells” *in vitro*. These cells play an essential role in nurturing and providing structural support for cells of spermatogenesis during their proliferation and development. DNA damage was evaluated using the Comet assay. The mRNA expression of p53 and bcl-2 genes and their proteins involved in apoptosis was also investigated. The antioxidant status of treated Sertoli cells was determined by measuring superoxide dismutase (SOD-1), catalase (CAT) and glutathione peroxidase (GPX-1) using quantitative polymerase chain reaction (qPCR). Furthermore, the effect of quercetin and its combination with IQ were examined. Results of the present study clearly showed that IQ-induced DNA damage as evident by increases in the Comet assay parameters. The activation of p53, repression of bcl-2 and reduction of the endogenous antioxidant enzymes were also involved in these mechanistic pathways. This may lead to reduced numbers of Sertoli cells by promoting early male germ



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cell differentiation. While the exogenous antioxidant quercetin significantly reduced the primary Sertoli cells *in vitro*.

**Biography**

Diana Anderson (H index 62) 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 450+ peer-reviewed papers, 9 books, has successfully supervised 32 PhDs, is an Editorial Board Member of 10 international journals. She is Editor-in-Chief of a book series on Toxicology for the Royal Society of Chemistry. She gives plenary and key note addresses at various international meetings. She is a consultant for many international organizations including WHO, EU, NATO, TWAS, UNIDO, OECD.

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