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Induction of DNA damage and apoptosis in spermatogonial stem cells by oxaliplatin *in vitro*

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Germline stem cells are susceptible to anticancer drug induced-DNA damage and oxidative stress, and even low doses to the testicular cells may pose reproductive risks with possible treatment-related infertility. DNA damage in spermatogonial stem cells, caused by chemotherapy, could induce cell cycle arrest and germ cell apoptosis, with the potential to cause infertility in men. Spermatogonial stem cells are the only cell type capable of transmitting genetic information to future generations. Various

compounds have a negative impact on the germline stem cells, either directly, or indirectly affecting them through their action on the spermatogonial cells. Eventually, these effects can inhibit fertility, and may have toxic consequences for the progress of the progeny. Oxaliplatin is a platinum-based anti-cancer drug with antineoplastic properties used mainly for colorectal cancer. It is cytotoxic due to platinum binding to DNA and the formation of intrastrand cross-links between neighbouring guanines. To examine the effects of oxaliplatin on spermatogonial cells separated using STAPUT unit-gravity velocity sedimentation. DNA damage was assessed in the Comet assay. The effects of oxaliplatin on mRNA and their proteins of P53, P21 and BLC2 were also studied using quantitative polymerase chain reaction (qPCR) and

Western blot methods. Results indicated that oxaliplatin induced DNA damage and significantly increased levels of P53, P21 and decreased BLC2 mRNA and their proteins. Understanding the mechanisms of action of oxaliplatin in spermatogonial stem cells is an important way to examine emerging new protection strategies for the reproductive system.

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 500+ peer-reviewed papers, 10 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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