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The chemoprotective activity of D-ribose-L-cysteine (riboceine) against the cytotoxic effects of methotrexate and docetaxel on normal and cancer cell lines

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Chemotherapy-induced oxidative stress (CIOS) plays a critical role in de novo cancer initiation and development. We hypothesised that preventing CIOS could reduce or prevent the advent of cancers induced by chemotherapeutic agents such as methotrexate (MET) and docetaxel (DOC). Riboceine (RIB) has been shown to replenish the decreased level of glutathione (GSH), the master antioxidant, in normal cells. However, there is a dearth of information on the protective effect of RIB on normal and cancer cells during chemotherapy. This study sought to determine the chemoprotective effects of RIB against the cytotoxic effects of DOC and MET on normal human prostate cell (PNT-2), human prostate cancer cell (PC3) and human breast cancer cell (MCF-7) lines. The effects of increasing concentrations of MET and DOC and their combination with RIB or N-acetylcysteine (NAC, positive control) on cell viability, GSH content and reactive oxygen species (ROS) level were determined and compared. Our results showed that 1) RIB protected the normal cells PNT-2 against the cytotoxic effects of MET and DOC; 2) RIB and NAC protected MCF-7 but not PC3 cell lines against the cytotoxic effects of MET and DOC; 3) the protective effect of RIB was associated with an increase in GSH content and a decrease in ROS level in both normal and cancer cell lines studied; 4) the effect of RIB was similar but less pronounced than the effect of NAC. Further studies including the investigation of other antioxidant defence systems such as catalase, superoxide dismutase and peroxidase should be conducted to confirm these findings at the molecular and *in vivo* levels.

Keywords: Cancer, Chemotherapy, Oxidative stress, D-ribose-L-cysteine, methotrexate, docetaxel.

Biography:

Benoit Banga N'guessan obtained his PhD degree in Pharmacology from the University of Strasbourg (France). He was first employed as a Lecturer at Nangui-Abrogoua University (Cote d'Ivoire) and promoted to the rank of Senior Lecturer and later joined the University of Ghana where he employed up to date. Benoit Banga N'guessan have a broad background in Pharmacology and Toxicology with specific training and expertise in Ethnopharmacology-oriented drug discovery in oxidative stress-induced non-communicable diseases such as diabetes, asthma and cancer. He is the founding-chairman of the NGO PRORESMAT which was established in 2008 to promote the scientific valuation of the Traditional African Medicine.