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Regucalcin protects HEPG2 cells from Doxorubicin-induced apoptosis and autophagy

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Regucalcin (RGN) is a cytosolic Ca^{2+}-binding protein that was discovered in 1978 and is known to be a multi-functional protein involved in number of cellular processes including – calcium homeostasis by regulating Ca^{2+} binding protein activity such as Ca^{2+}-ATPases, calmodulinkinase and PKC. This protein is mostly found in liver and kidney tissues. Furthermore, RGN also plays a defence role in Ca^{2+}-mediated stress protection and apoptosis. Doxorubicin (DOX) is a potent anti-cancer drug that is used either in isolation or in combination with other drugs for treating variety of cancers. Several studies have shown that DOX induces p53 activation leading to apoptosis in both normal and tumourendothelial cardiomyocytes cells; by causing cytochrome c release from the mitochondria, resulting in caspase 3 activation and induction of apoptosis. Moreover, this drug has the ability to damage DNA by producing reactive oxygen species. A major problem of DOX treatment is that it is highly cardio- and hepato-toxic.

In the current study we have investigated the molecular mechanisms of DOX-induced hepatic cell death and show that DOX can induce cell death in human HepG2 liver cells through a number of different mechanisms including; apoptosis, DNA damage and autophagy. However, necrosis does not appear to be involved in this process. Furthermore, over-expression of RGN in HepG2 cells was found to protect against the toxicity by DOX. Therefore increased expression of RGN in the liver could be a mechanism for protection against DOX-induced toxicity.

Biography

Noor has completed her master degree(MSc) in Histologyon March2010 from university of Duhok (Kurdistan Region Government of Iraq) and has published her master thesis as two papers in local university journal. Noor worked as anassistant lecturer in biology department, university of Duhoksince 2010then she started her PhD on September 2013 focusing on the mechanism effect of chemotherapy drugs on liver and kidney cell line.

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