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Application of molecular imprinting technique for preparation of 5-flurouracil nanoparticles: testing antitumor activity in mice

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Abstract

Recently, a considerable attention has been paid to nanotechnology. This study examined the potential chemotherapeutic effect of a molecularly imprinted nanopreparation of 5-fluorouracil against Ehrlich solid tumors grown in mice after transplanting tumor cells to female mice. Mice were classified as; Group 1: control solid tumor bearing mice. Groups 2&3: tumor bearing mice treated with 5-fluorouracil (5 and10 mg/kg, per oral). Groups4&5: tumor bearing mice treated with nano-5-fluorouracil (5 and10 mg/kg, per oral); all treatments continued for three weekly. Treatment with nano-5-fluorouracil produced greater antitumor effect in comparison to free 5-fluorouracil as designated by greater apoptosis area in the dissected tumors and lower tumor mass. In addition, less count of mitotic figures and greater necrosis area were observed in the tumor specimens with a decline in the number of proliferating nuclei in comparison to free 5-fluorouracil. In addition, the findings revealed a significant down-regulation of caspase-3 and vascular endothelial growth factor tumour expression. Together, these findings further affirm the ability to use nanotechnology to increase 5-fluorouracil anticancer efficacy.

Biography

Sawsan A. Zaitone is curently working in Department of Pharmacology and Toxicology, Faculty of Pharmacy, University of Tabuk, Tabuk, Saudi Arabia. Her skills and expertise are Antimicrobial and chemotherapeutic agents, Insulin Resistance, Neuroscience, Metabolism, Cancer Research, Diabetes, Tumors, Antioxidants, Inflammation, Metabolic Diseases and Neurodegeneration. She has about 82 publications, 13,366 reads and 851 citations.

Publications

1. Acetyl-L-carnitine and α-lipoic acid affect rotenone-induced damage in nigral dopaminergic neurons of rat brain, implication for Parkinson's disease therapy
2. Rosuvastatin promotes angiogenesis and reverses isoproterenol-induced acute myocardial infarction in rats: role of iNOS and VEGF
3. Piracetam and vinpocetine ameliorate rotenone-induced Parkinsonism in rats
4. Pentoxifylline and melatonin in combination with pioglitazone ameliorate experimental non-alcoholic fatty liver disease
5. Synthesis, structure and antidiabetic activity of chromium (III) complexes of metformin Schiff-bases

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