In vitro antiproliferative/cytotoxic activity of novel quinoline compound SO-18 against various cancer cell lines

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In the designs of many synthetic compounds, quinoline derivatives have received great attention due to their diverse pharmacological properties. The aim of this study was to investigate the anticancer properties and mechanism of action of the novel quinoline derivatives, SO-18, synthesized by substitution reactions and bromination of any quinoline molecule. Antiproliferative and cytotoxic activity of SO-18 was investigated in vitro on C6 (rat brain tumor cells), HeLa (human cervix carcinoma) and HT29 (human colon carcinoma) cells by using BrdU Cell Proliferation ELISA and lactate dehydrogenase (LDH) assays. In contrast to 5-florouracil (5-FU), SO-18 significantly inhibited proliferation of all studied cells. According to LDH assay, this compound exhibited high cytotoxicity was on HeLa, HT29 and C6 cells. The mechanism of anticancer activity of it was determined using DNA laddering assay. Although the results showed that SO-18 may be a potent anticancer drug candidate with high antiproliferative activity, further studies are needed to elucidate its mechanism of action.

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Electrically controlled release of indomethacin from polycarbazole/natural rubber blend film

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A transdermal drug delivery system (TDDS) represents an alternative route to deliver a medical species into the blood circulation through the skin. It promotes a healing by a getting rid of first-pass metabolism by a controlled release of drug into the patient. On the other hand, TDDS is not suitable for all drugs for the principal reason of the skin's barrier. Therefore, to overcome the limitation of TDDS, the electric field and the conductive polymer were utilized in the TDDS system to improve the drug delivery. In this work, indomethacin, an anti-inflammatory drug was loaded into a biocompatible matrix, namely natural rubber (NR). NR was blended with a conductive polycarbazole (PCz) which was used as a drug carrier to improve the controlled drug release under applied electric field. The in vitro permeation of the drug from the films was studied by a modified Franz diffusion cell which was filled with phosphate-buffered saline (PBS) buffer at pH equal to 7.4 and maintained at the temperature of 37 °C. The amount of released drug was detected by UV–vis spectrometry to investigate the effects of conductive polymer and electric field strength on the drug-released behavior.

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Effects of butyrate and manganese on productivity, sialylation, N-glycosylation site occupancy and biological properties of CHO-derived human thyrotropin

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In order to develop a therapeutic recombinant protein it is critical to fully understand both the structure of the protein itself and the process leading to its generation. Productivity and product quality can be potentially affected by the addition, in the host cell cultivation, of certain chemical agents that can cause alterations in cell function and cellular metabolism. When agents such as sodium butyrate (NaBu) and manganese chloride ($MnCl_2$) were utilized, individually or combined, in the cultivation of CHO cells producing human thyrotropin (hTSH), alterations occurred in protein productivity and in its glycosylation. Sialic acid content and glycosylation site occupancy were modified, while in volumetric productivity, an increase of 1.4-fold when $MnCl_2$ was utilized and of about 3-fold in the presence of NaBu or NaBu + $MnCl_2$ were observed. Increases of about 2%, 12% and 14% in the sialic acid content were observed with the addition of $MnCl_2$, NaBu or NaBu + $MnCl_2$ to culture medium. An increase of 1.3% in N-glycosylation site occupancy was observed in the presence of $MnCl_2$, while an higher increase (3%) occurred when NaBu or NaBu + $MnCl_2$ were utilized. Despite alterations, the in vivo biological activity and the pharmacokinetic behavior were found not significantly different in all these hTSH preparations.

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LPS adsorption by native and PEI-modified carbonized rice husk from protein solutions

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Removal of bacterial lipopolysaccharide (LPS) from aqueous solutions is a challenging bioengineering task because of LPS ubiquity as well as its very high physical and chemical stability. The present work describes the adsorption process using carbonized materials samples for the removal of endotoxins. Rice husks have been obtained by high-temperature carbonization and used as raw material in the preparation of granular activated carbon followed by chemical activation with polyethyleneimine (PEI) for increasing the sorption of bacterial endotoxins from dilute aqueous solutions