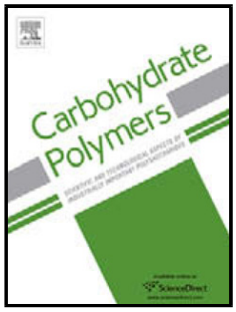

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SYNTHESIS OF CHITIN-GLUCAN-ALDEHYDE-QUERCETIN CONJUGATE AND EVALUATION OF ANTICANCER AND ANTIOXIDANT ACTIVITIES

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Highlights

- Antioxidant and anticancer properties containing conjugate have been developed
- Chitin-glucan aldehyde and quercetin linked via condensation process
- The resulting conjugate material was better than anticancer and antioxidant treatment
- Safe, non-toxic, polymeric conjugate for biomedical application

ABSTRACT

In the present study, we have synthesized chitin-glucan-aldehyde-quercetin (chi-glu-ald-que) conjugate via condensation reaction. Synthesis of chitin-glucan-aldehyde (chi-glu-ald) complex was facilitated by the oxidation of chitin-glucan (chi-glu) complex. Formation of conjugate was confirmed by Proton nuclear magnetic resonance spectroscopy (^{1}H-NMR) and Fourier-transform infrared spectroscopy (FT-IR). Morphological studies showed that after grafting of quercetin, several changes on surface were depicted and a more crystalline nature was observed. The chi-glu-ald-que conjugate displayed strong antioxidant activity. It showed 69% of 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity at 1 mg/mL and 72% of 2, 2-azinobis-(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS^{*+}) radical scavenging activity at 1 mg/mL concentration, which are much higher than that of chi-glu complex. The anticancer activity of chi-glu-ald-que conjugate was performed in Macrophage cancer cell lines (J774) and biocompatibility was performed in Peripheral blood mononuclear cells (PBMCs). The chi-glu-