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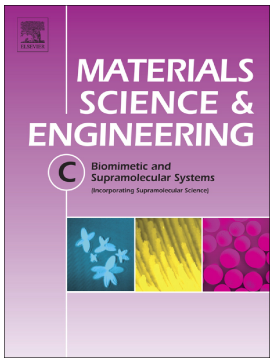

Co-delivery of curcumin and serratiopeptidase in HeLa and MCF-7 cells through nanoparticles show improved anti-cancer activity

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Co-delivery of curcumin and serratiopeptidase in HeLa and MCF-7 cells through nanoparticles show improved anti-cancer activity

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KEYWORDS: curcumin; serratiopeptidase; nanoparticle; cytotoxic; anti-migratory; anti-inflammatory; ROS; macrophage

Abstract

Curcumin was employed to prepare anticancer nanoparticles (size 175±15 nm) using anti-inflammatory enzyme serratiopeptidase by desolvation method. Here serratiopeptidase acted as a carrier as well as bioactive molecule in the nanoformulations. The Cur-SPD NPs (curcumin loaded serratiopeptidase nanoparticles) were characterized using DLS, FESEM and FTIR. The *in vitro* release behavior depicted biphasic pattern at 37 °C (pH 7.4) and release of 95% of both molecules occurred in 24 hours. Serratiopeptidase not only provided stability to curcumin but also increased its effectiveness against cancer cells. These nanoparticles had anti-cancer activity in MCF-7 and HeLa cell lines as shown by cytotoxicity assay, DAPI nuclear staining, ROS production and DNA damage. The immunomodulatory tests showed that Cur-SPD NPs reduce level of IL-6 but increase TNFα level in THP1 cell lines. Structural similarity of serratiopeptidase to matrix metallo proteases (MMPs), particularly MMP8, have been found (based on low RMSD values) to induce TNFα production and play tumour suppressive role in certain cancers. Thus anti-cancer properties of Cur-SPD NPs may be attributed to synergistic effect of

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