

p-4-Vinyl Pyridine-co-Cannabidiol Polymer: application in therapy

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Abstract

Lung cancer is the leading cause of cancer death worldwide. Despite numerous therapeutic advances based on chemotherapy, surgery, radiotherapy and immunotherapy, they are not enough to improve the prognosis in advanced stages of the disease, being necessary new therapeutic strategies [1]. In this context, the use of nanoparticles for drug transport can reduce some limitations of the treatments, such as reduced bioavailability, drug toxicity in healthy cells, and the possibility of natural elimination of the drug by the human body. In this study we have evaluated the activity of cannabidiol (CBD), one of the main phytocannabinoids of *Cannabis sativa* L, loaded in a nanoformulation [2,3,4,5]. For this purpose, we have used 4-p-vinylpyridine (4PV) nanoparticles and co-polymeric nanoparticles with CBD covalently incorporated on the surface (solid@p4VP-co-CBD). The in vitro cell model used in the study was the A549 non-small cell lung cancer (NSCLC) cell line, in which was carried out antiproliferative, cell colony and wound-healing assays. The results didn't show toxicity of the new nanoformulation, being safe for therapeutic use. Moreover, the cytotoxicity and cell viability reduction of the drug was preserved in the new nanoparticle, but in a reduced form compared to its free form. Even so, the ability to inhibit cell migration in the encapsulated drug was completely nullified. In conclusion, this nanoparticle was able to maintain some of the antitumor properties of CBD, allowing its use in the development of a targeted therapy that can benefit from the advantages of nanoencapsulation.

References

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Figures

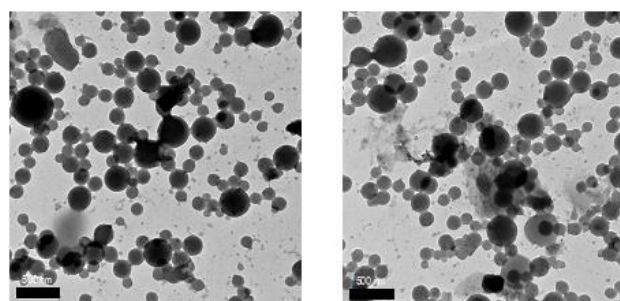


Figure 1. TEM images of solid@p4VP-co-CBD

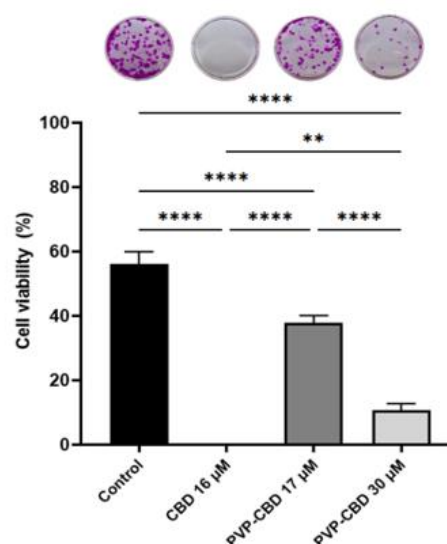


Figure 2. Percentage cell viability after 72 h incubation with CBD (IC₅₀) and solid@p4VP-co-CBD (IC₅₀ and 30 μM).

