Hydroxyapatite functionalized with folic acid for studies of incorporation and release of anticancer drug.

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Hydroxyapatite (HAp) is a promising material for application as a support for antineoplastic drugs, since it has characteristics suitable for use in the human body, such as biocompatibility, non-toxicity, bioreabsorption and bioactivity [1]. Linked to HAp, folic acid or vitamin B9 has the ability to be a vectorizer for cancer cells, since these cells have a large amount of folate receptors (stable form of folic acid), unlike healthy cells [2]. Thus, the present research has a high interest in the development of a carrier system based on the synthesis of HAp Nanoparticles (NPs) functionalized with folic acid for studies on the incorporation and release of anticancer drugs. The material was produced using the precipitation method for the synthesis of HAp with COO^- groups on its surface, which are binders for folate, using the precursor solutions of ammonium hydrogen phosphate 0.06 $mol.L^{-1}$, calcium sulfate 0.1 $mol.L^{-1}$, citric acid 0.3 $mol.L^{-1}$ and ammonium hydroxide 3.0 $mol.L^{-1}$ for pH control = 9.0. HAp was filtered, washed and dried at 50 ºC for 24 h. HAp in powder form was added to 0.001 mol.L-1 folic acid and remained under stirring for 48 h, then it was filtered, washed and dried at 50 ºC for 24 h. Incorporation tests of the 5-Fluorouracil antineoplasic agent were performed for pure HAp and functionalized with folic acid. Characterizations by X-ray diffractometry indicated HAp as the main phase, while the Fourier transform infrared analysis showed functional groups typical of HAp and folic acid. Measurements in the UV-visible show that the system has good drug adsorption capacity.

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References:

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