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Development of an inorganic nanocarrier Loaded with phytotherapic agent

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The interest in promoting greater efficiency in treating diseases with bioactive molecule has mobilized the scientific community to develop inorganic matrices to be used as carriers for phytotherapeutics. This strategy aims to overcome the inherent challenges of these species, such as low solubility permeability, and bioavailability, as in the case of baicalina (7-glucronic acid, 5,6-dihydroxy-flavone, $C_{21}H_{18}O_{11}$, a flavonoid from medicinal herbs. It is a bioactive of great pharmacological interest because of its broad spectrum therapeutic properties, such as antioxidant, anti-inflammatory, and anticancer activities [1], Layered double hydroxides (LDHs) are promising as inorganic carriers because they present a structure that allows bioactive species to be intercalated, enhancing their stability and enabling controlled and targeted release,increasing theraupeutic efficiency. Another aspect that makes LDHs desirable for such applications are injured tissue rapair, regulation of gene expression, immunimodulation activity, osteogenic differentiation, and induction of neovascularization and angiogenesis [2]. The baicalin intercalation was performed by the coprecipitation method under controlled pH, (self-assembling approach). The obtained material was characterized by spectroscopic, thermal, and structural techniques. The X-ray difraction pattern confirmed the intercalation of baicalina between the layered structure, evidenced by the basal spacing of 1.3 nm (gallery height of about 0.84 nm). The analyses allowed defining the formula $\underline{Zn_2Al(OH)_6}\cdot 3.8H_2O$ for the orange compound, (Tand a loading capacity of about 56 wt%). The vibrational spectrum in the infrared evidenced the deprotonation of the baicalin carboxylic group and the phytotherapeutic's structural preservation [3]. The characterization results highlighted the efficiency of the coprecipitation method and the defined experimental parameters in the synthesis of LDH intercalated with baicalin, allowing us to go further toward studies about its performance *in vitro* and *in vivo assays*.

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