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In vitro toxicity assessment of curcumin-nanoparticles used for targeted-cancer therapy

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Recently nanomedicine represents a promising strategy for targeted-cancer therapy. It offers numerous advantages including optimizing poor solubility-drugs bioavailability. The present study focused on exploring the efficiency and the safety of curcumin nanomedicine. This active component of turmeric extract derived from the *Curcuma longa* plant has raised a considerable interest in medicine owing to its negligible toxicity and multiple therapeutic actions including anti-cancer and anti-inflammatory activities. Among its various molecular targets, some are involved in bone remodeling, which strongly suggests that curcumin can also affect the skeletal system. The present study sheds light on the current and potential applications of curcumin to treat bone disorders characterized by an excessive resorption activity including breast cancer bone metastasis. We designed a smart nanoformulation of curcumin to overcome its physicochemical and pharmacokinetic constraints as previously described. We conducted *in vitro* studies to assess anti-tumoral and antiresorption activities and toxicity of this nanoformulation on normal bone cells. After testing different concentrations and incubation time of pluronic, stable nanoparticles were obtained and characterized in terms of size and charge. For the *in vitro* assay, we used the well-characterized estrogen-independent human breast adenocarcinoma cell line MDA-MB-231. In addition, the mouse monocyte cell line RAW 264.7 was cultured in a-MEM medium and stimulated with RANK-L for 4 days. Preliminary results strongly suggest that these nanoparticles may provide anti-tumoral properties without inducing cytotoxic effect towards normal bone cells. We demonstrated that formulating curcumin in nanoparticles significantly promotes its anti-cancer activities and might be a promising approach for treating bone metastases.

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Synthesis and hypolipidemic properties of novel N-(4-benzoylphenyl) pyrrole-2-carboxamide derivatives

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Hyperlipidemia is involved in development of atherosclerosis and coronary heart disease. We synthesized two novel pyrrole carboxamide derivatives N-(4-benzoylphenyl)-4-bromo-2,5-dihydro-1H-pyrrole-2 carboxamide (compound 1) and 4-amino-N-(4-benzoylphenyl)-1-methyl-1H-pyrrole-2 carboxamide (compound 2) and test them as antihypelipidemic agents. The synthesized compounds were characterized using I.R. and NMR. Biological evaluation of compound 1 and 2 showed that compound 1 significantly decreased TG, LDL-C, TC and mild increase in HDL-C in plasma. Contrarily, compound 2 appeared to be less potent compared to 1; it moderately decreased TG, LDL-C and TC with mild increase of HDL-C. The NH pyrrole mediates H-bond interaction of 1 with the backbone of the target(s) protein(s) and this corresponds to the high potency of 1. The lower activity of 2 confirms that the presence of H-bond is essential to induce high activity. The finding of this work suggests that this scaffold might be promising as antihypelipidemic agents for future work.

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