OP-30

DOI: 10.14232/syrptbrs.2021.op30

Design and synthesis of betulinic acid gold nano-particles with enhanced pharmaceutical properties

Roxana Ghiulai, Marius Mioc, Gabriela Nistor, Roxana Racoviceanu, Codruta Soica

Faculty of Pharmacy, University of Medicine and Pharmacy Victor Babeș Timișoara, Timișoara, Romania

Betulinic acid (BA) is a pentaciclic triterpene, exhibiting strong cytotoxic activity but low water solubility, which affects its bioavailability and biological activity. Extensive studies have been carried out for increasing the solubility and bioavailability of BA, one option being BA-bioconjugates with gold nanoparticles (GNP). The synthesis of BA GNP bioconjugates was achieved by using cysteamine as a linker between the organic molecule and the metallic surface of GNP. BA's carboxylic group was condensed to the amine group of cysteamine using DCC and DMAP in dichlormethane. The completion of the reaction was monitored by means of TLC. The obtained BA amide was purified by flash column chromatography. FT-IR and LC-MS analysis confirmed the identity of the synthesized compound. Synthesis of GNPs was conducted accordingto a previously published procedure. The synthesis is achieved by reducing chloroauric acid ($HAuCl_4$) withtrisodium citrate dihydrate ($C_6H_5O_7Na3{\cdot}2H_2O$) using a $HAuCl_4$:$C_6H_5O_7Na3$molar ratio of 1:3.5. The obtained clear ruby-redsolution was cooled at room temperature. Purificationwas accomplished by repeated steps involving centrifugationfollowed by washing with deionized water. The finalproduct was lyophilized and resuspended in methanol. A methanolic solution of BA-cysteamine amide was added drop wise to the methanolic suspension of GNPs, under continuous stirring for 24h, allowing the thiol group to attach to the metallic surface. After the completion of the reaction, methanol was slowly evaporated under reduced pressure and the obtained formulation was washed with deionized water, centrifuged and lyophilized. The obtained product was refrigerated. This current nanoformulation will be further investigated for its proposed anticancer activity.

Supervisor: Prof. Codruta Soica