Host-Guest Complexation of Oxaliplatin and Para-Sulfonatocalix[n]Arenes for Potential Use in Cancer Therapy

Iten Mamdouh Fawzy ,Sherif Ashraf Fahmy ,Fortuna Ponte,Emilia Sicilia ,Udo Bakowsky ,Hassan Mohamed El-Said Azzazy

Abstract

P-sulfonatocalix[n]arenes have demonstrated a great potential for encapsulation of therapeutic drugs via host-guest complexation to improve solubility, stability, and bioavailability of encapsulated drugs. In this work, guest-host complexes of a thirdigpgtcvkqp"cpvkecpegt"ftwi"*qzcnkrncvkp+"cpf"r/4/uwnhqecnkz]p ctgpgu"*p"?"4 and 6="r/ SC4"cpf"r/UE6."tgurgevkxgn{+"ygtg"rtgrctgf"cpf"kpxguvkicvgf."wukpi"1H NMR, UV, Jobøs plot analysis, and DFT calculations, for use as cancer therapeutics. The peak amplitude of the prepared host-guest complexes was linearly proportional to the concentration of oxaliplatin in the range of 1.0" "32 7"O 1"vq"2.1" "32 6"O 1. The tgcevkqp"uvqkejkqogvt{"dgvyggp"gkvjgt"r/UE4"qt"r/UE6 and oxaliplatin in the formed complexes was 1:1. The stability constants for the complexes were 5.07" 104"O 1"cpf"6.3" "104"O 1. These correspond to complexation free energy of 6.39 and 6.52"mecnl o gn"hqt"r/UE4"cpf"r/UE6, respectively. Complexation dgvyggp"qzcnkrncvkp"cpf"r/UE4"qt"r/UE6 was found to involve hydrogen bonds. Both complexes exhibited enhanced biological and high cytotoxic activities against HT-29 colorectal cells and MCF-7 breast adenocarcinoma compared to free oxaliplatin, which warrants further investigation for cancer therapy.

Molecules 2020, December

Future University In Egypt (http://www.fue.edu.eg)