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Development and in vitro Evaluation of Polymer-Drug Conjugates Containing Potentiating Agents for Combination Therapy

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Abstract : Combination therapy is a treatment approach that is used to prevent the emergence of drug resistance. This approach is used for the treatment of many chronic and infectious diseases. Potentiating agents are currently explored in combination therapy, resulting in excellent therapeutic outcomes. Breast cancer and malaria are two chronic conditions responsible globally for high death rates. In this research, a class of polymer-drug conjugates containing potentiating agents with either antimalarial or anticancer drugs were prepared by Michael Addition Polymerization reaction and ring-opening polymerization reaction. Conjugation of potentiating agents with bioactive compounds into the polymers resulted in conjugates with good water solubility, highly selective and non-toxic. In vitro cytotoxicity and in vitro antiplasmodial evaluation on the conjugates revealed that the conjugates were more effective when compared to the free drugs. The drug release studies further showed that the release profile of the drugs from the conjugates was sustained. The findings revealed the potential of polymer-drug conjugates to overcome drug toxicity and drug resistance, which is common with the currently used antimalarial and anticancer drugs.

Keywords : anticancer, antimalarials, combination therapy, polymer-drug conjugates
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