Abstract

A prodrug is an active drug that has been disguised and is intended to be activated through an enzymatic or chemical reaction in the body as a pharmacologically inactive component that then goes through biotransformation to become its therapeutic activity. The prodrug method has also been utilized to improve the medications' target-specific selectivity. The prodrug can get past obstacles like low bioavailability, poor aqueous solubility, chemical instability, insufficient oral absorption, quick pre-systemic metabolism, insufficient brain penetration, toxicity, unpleasant taste and odor, local irritation, and change the physical form of the drug by chemically altering the active agent.

Quinine is a drug with a strong bitter taste that has a negative effect on its acceptance by patients, whether for the treatment of malaria or muscle spasms and others. In this study, we aimed to mask the intensely bitter taste of quinine by synthesizing prodrugs with suitable linkers that can release the parent drug (quinine) when exposed to a physiological environment. The prodrugs were synthesized by esterification of their free hydroxyl groups using different linkers (1, 2-cyclohexanedicarboxylic anhydride, succinic anhydride, maleic anhydride) instructions through (HPLC, Melting Point, LC-MS, FT-IR, H-NMR) to check the purity of the manufactured compounds.

In *vitro* kinetic studies for the prodrugs were tested and analyzed in the laboratory using the HPLC apparatus at a constant temperature of 37^{o}C and various pHs such as 0.1 N HCl, pH 2.2, pH 5.5, and pH 7.4, which are similar to the pH of the human body. Unfortunately, the results of the hydrolyzing of the prodrugs at all pH levels were stable and did not release the parent drug (Quinine). This could be a result of the quinine anion's (R-O-) poor leaving group properties. The ester link could be broken by blood enzymes such esterase to furnish the parent drug in the near future.