Design and synthesis of some novel compounds derived from hybdrid coumarin-thiazole structures

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Abstract

Coumarins are molecules that belongs to a special family of compounds which, due to the conjugated double bond become interesting molecules for many fields of study. Their structure and physical properties make them a privileged scaffold in medicinal chemistry. Also, they exhibit a wide range of biological activity including free radical scavenging. Recent research has focused attention on the anticancer activity of coumarin and coumarin- derived compounds due to their high level of cytotoxicity. Thiazole rings, on the other hand, had also showed remarkable anticancer activity on various cancer cells. Based on this, the idea was to combine those two heterocyclic units in one hybrid unique molecular structure with high anticancer potential. The synthetic strategy was simple, applying the reaction of diazotation of 2-aminothizoles and using the corresponding diazonium salts as good electrophiles to attack the 4-hydoxycoumarin at position 3. Furthermore, it was revealed by previous investigation that the alkyl substituent at the thiazole ring is playing key role. Namely, by increasing of the nonpolar tail at that part of the molecule, the biological activity is also increased. Based on this, some 4-substituated-2-aminothiazoles were synthesized by optimization of the Hantzsch reaction, prior to diazotation and coupling with the coumarin core. All of the newly synthetized compounds were purified by crystallization and the melting point was determined. Finally, the obtained compounds were characterized by spectroscopic means.

Keywords: synthesis, coumarin, thiazole, Hantzsch reaction, anticancer activity

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Figures

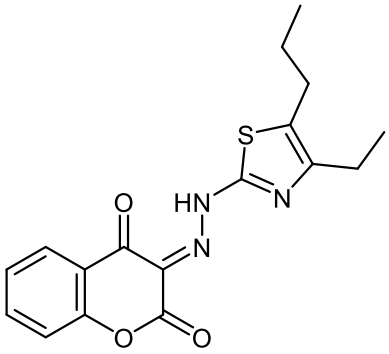

Figure1. Structure of novel coupling derivative