Synthesis, Antimicrobial, and Anticancer Activities of a New Series of Thieno[2,3-d] Pyrimidine Derivatives

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Abstract:

A new series from thieno[2,3-d] pyrimidine derivatives have been synthesized based on 2-ethylmercapto)-4-mercapto-6-phenyl-5-pyrimidine carbonitrile, these compounds used in the synthesis of many pyrimidothienopyrimidine derivatives and triazolo[1″,5″:1,6″][pyrimido]40,50:4,5]thieno[2,3-d] pyrimidine derivatives. The chemical composition of these compounds was confirmed by 1H NMR, 13C NMR, and MS techniques. Some of the synthesized compounds were screened for their antimicrobial and anticancer agent. Compound (9b) showed strong effect on Aspergillus Fumigatus (RCMB 2568), Candida albicans (RCMB 05036), Saphylococcus aureus (RCMB 010010), Bacillis subtilis (RCMB 010067), Salmonella sp. (RCMB 010043), and Escherichia coli (RCMB 010052). Compounds (2) and (5a–k) were evaluated for their IC50 values against two cancer cell lines (MCF-7 and HeLa cells) in the presence of Paclitaxel as reference material. Compound (5g) showed the highest cytotoxicity against MCF-7 (IC50 values about 18.87 ± 0.2 μg/mL) cells compared with Paclitaxel (IC50 values about 40.37 ± 1.7 μg/mL). Also, compound (5d) showed the highest cytotoxicity against HeLa (IC50 values about 40.74 ± 1.7 μg/mL) cells compared with Paclitaxel (IC50 values about 45.78 ± 0.8 μg/mL).

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