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Antiproliferative activities of newly synthesized heterocyclic compounds against human cell lines

Benzimidazole and its derivatives are among the significant heterocyclic group which exhibits a wide range of biological applications such as antibacterials, antifungals, antivirals, anticancers, antihypertensives, anti-diabetics, anti-HIVs and anti-convulsants. Researchers give importance to the synthesis of benzimidazoles and its derivatives due to these wide ranging biological activities. Furthermore, a few products containing benzimidazole nucleus like fenbendazole, bendamustine, carbendazim, bezitramide, diabazole, and etc. have already been commercialized and are being employed in treating different diseases. Cancer is a general health problem in every country of the world. Therefore, a series of heterocyclic compounds including benzimidazole nucleus that would be effective against cancer cell lines, were synthesized and the structures of compounds were verified by appropriate spectroscopic and analytic methods such as ^{1}H NMR, ^{13}C NMR, IR and elemental analysis. The synthesized compounds were tested towards human adenocarcinoma epithelial colon cell line (DLD-1), human liver epithelial carcinoma cell line (HepG2), human adenocarcinoma epithelial breast cell line (MDA-MB-231) and human normal epithelial virus transformed cell line (Beas-2B) using the MTT assay method. The drug candidates were prepared at nine different concentrations ranging from 200 μM to 0.5 μM. Cisplatin, ploxal, fluoro-5 and irinocam were also tested against cell lines under the same conditions for comparison. Furthermore, the microscopic examination of cells was done using Leica inverted microscope and Olympus confocal microscope. According to the obtained IC50 values, the substituent on benzimidazole nucleus has a major impact on cancer activity and the synthesized compounds have antiproliferative activity as *in-vitro* in human cell lines.

Biography

Senem Akkoç has obtained her Bachelor's Degree from Bülent Ecevit (Zonguldak Karaelmas) University in 2009. She has completed her Master's degree in the synthesis and properties of N-heterocyclic salts at Inonu University in 2012. She has completed her PhD from Erciyes University about in-vitro cytotoxic activity of synthesized benzimidazolium salts. She had been in the University of Sydney (Australia) as a Visiting Scholar from 2015 to 2016. She has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of three journals.

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