Research Festival

Abstract Title: [Please do not use all caps]

Breast Cancer Cell Viability in Cyrene and Hydroxamic Acid Derivatives

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Abstract: [Limit to 300 words]

One of the most common types of cancer in females is breast cancer. The American Breast Cancer society expects that 43,250 women will die of breast cancer in 2022. Due to the uses of Class I Histone deacetylases' inhibitors as anticancer agents, we synthesized HDAC new inhibitors using microwave-assisted methods, including N-hydroxy-1H-indole-2-carboxamide and 1H-indole-2-carboxylic acid. These products and the reactant were tested to be used as an HDAC Class I inhibitor in mammalian breast cancer cells. Two synthesized compounds and ethyl indole-2-carboxylate were tested using WST-1 for cell viability in MDA-MB-231 and MCF-7 breast cancer cells: The MDA-MB-231 cells are triple negative cells that lack estrogen receptors (ER), progesterone receptors (PR), and HER2 proteins. The MCF-7 breast cancer cells have ER, PR, and HER2 proteins. Based on the viability test there is cell death that occurs at a higher μM dosage than desired. The half maximal effective concentration (EC50) for ethyl indole-2-carboxylate for the MDA-MB-231 was 335μM and 315 μM for the MCF-7. The EC50 for N-hydroxy-1H-indole-2-carboxamide was 340 μM for the MDA-MB-231 and 300 μM for the MCF-7. The EC50 for 1H-indole-2-carboxylic acid was 800 μM for the MDA-MB-231 and was not effective on the MCF-7 cells. Adjustments can be made to increase the toxicity of the compounds so the μM dosage is within the recommended range to proceed with further testing. The common solvent, dimethyl sulfoxide (DMSO) used in pharmacology discovery is toxic to the cells and reacts with compounds in cell viability tests. Therefore, we investigated the toxicity of Cyrene® advertised as a green solvent, compared to DMSO using WST-1 cell viability test in MDA-MB-231 and MCF-7 breast cancer cells. We discovered that Cyrene® is significantly more toxic to these cells than DMSO.