EXPLORING THE ANTICANCER EFFECT OF A NEWLY SYNTHESIZED PYRIDINE DERIVATIVE IN AN IN-VIVO BREAST CANCER MODEL IN RATS

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Breast cancer is a vigorous cancer that impacted more than 2.3 million females worldwide in 2022 alone, as well as, more than 650 thousand death cases in the same year. New treatments need to be formulated to control such incline. In fact, several pyridine (a nitrogen bearing heterocyclic scaffold) derivatives exhibited good anticancer effects against diverse cell lines. Therefore, to explore new anticancer pyridine entities, novel pyridine derivatives were designed, synthesized, and evaluated for their anticancer mechanistic pathway through an in vivo study. Breast cancer was induced in female Wistar rats using 7,12-dimethylbenz[a]anthracene (DMBA) and were divided into 4 groups; Normal control, positive control, paclitaxel treated group, pyridine derivative treated group. The pyridine new derivative showed promising results in increasing the tumor cells apoptosis through increasing the pro-apoptotic Bax protein while decreasing the anti-apoptotic Bcl-2. Moreover, the newly synthesized pyridine derivative induced disruption in the cellular microtubules by significantly decreasing the tubulin heterodimers levels (α-tublin and β-tublin) compared to the paclitaxel treated group. Furthermore, the pyridine derivative showed a significant decline in the proinflammatory marker (TNF- α) which is known to induce cancer progression. Finally, further future studies is recommended to unveil more mechanistic aspects of that newly synthesized agent.