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New Quinazoline Derivative Exhibit Cytotoxic Effect agaisnt MCF-7 Human Breast Cancer Cell

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Abstract : The new quinazoline Schiff bases have been synthesized through condensation reaction of 2-aminobenzhydrazide with 5-bromosalicylaldehyde and 3-methoxy-5-bromosalicylaldehyde. The compound was investigated for anticancer activity against MCF-7 human breast cancer cell line. It demonstrated a remarkable antiproliferative effect, with an IC50 value of 3.41±0.34, after 72 hours of treatment. Most apoptosis morphological features in treated MCF-7 cells were observed by AO/PI staining. The results of cell cycle analysis indicate that compounds did not induce S and M phase arrest in cell after 24 hours of treatment. Furthermore, MCF-7 cells treated with compound subjected to apoptosis death, as exhibited by perturbation of mitochondrial membrane potential and cytochrome C release as well as increase in ROS generation. We also found activation of caspases 3/7 and -9. Moreover, acute toxicity results demonstrated the nontoxic nature of the compounds in mice. Our results showed the selected compound significantly induce apoptosis in MCF-7 cells via intrinsic pathway, which might be considered as a potential candidate for further in vivo and clinical breast cancer studies.

Keywords : quinazoline Schiff base, apoptosis, MCF-7, caspase, cell cycle, acute toxicity
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