



## Design, Synthesis and Biological Evaluation of N-(Benzazol-2-yl)-2-phenylacetamide Derivatives as Potent Antiproliferative Agents Against MCF-7 Breast Cancer Cell Line

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### Abstract

Carboxamides have been used as a linker in adjoining different pharmacophores to build novel cytotoxic agents [1,2]. A series of benzimidazole-2-carboxamide derivatives (**BSH 104-120**), with three types of phenyl groups have been designed and synthesized. H- / 4-F and 2,5-OCH<sub>3</sub> Substituted benzyl group of benzazole-2-carboxamide (benzimidazole, benzoxazole or benzothiazole) rings system gave nine target compounds. Most of our synthesized compounds exhibit cytotoxic effect against MCF-7 cell by using xCELLigence DP real time cell analysis system. Compounds **104**, **107** and **119** showed more potent anticancer activity than doxorubicin against MCF-7 with IC<sub>50</sub> values of 4.31 μM, 3.83 μM and 4.52 μM respectively. The most potent compounds (**104**, **107** and **119**) on the induction of apoptosis in the breast cancer cell line were analyzed by flow cytometry. Compound **119** induced the late apoptosis 20.63%. In order to determine the effect of promising compound **119** on cell cycle, MCF-7 cells were treated with IC<sub>50</sub> value of **119** for 48h and quantified the percentage of cells in different cell cycle phases. Compound **119** has induced significantly, the ratio of cells in the G1 phase compared with control. Compound **119** has potential anticancer effect and give a promising strategy for further research of cancer therapy.

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### References

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- 2) Tokala R, Mahajan S, Kiranmai G, Sigalapalli DK, Sana S, John SE, Nagesh N, Shankaraiah N. *Bioorg Chem*. 2021 Jan;106:104481.



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