26th Congress of SCTM

Sept. 20-23, 2023, Metropol Lake Resort, Ohrid, N. Macedonia

Design and *In Vitro* Evaluation of Monocarbonyl Curcumin Analogs Eliciting Breast Cancer Cytotoxicity

K. Dragarska[a], I. Todorovska[a], R. Stojchevski[b, c], N. Hadzi-Petrushev[b], M. Mladenov[b], D. Avtanski[c], and J. Bogdanov[a,*]

[a] *Faculty of Natural Sciences and Mathematics, Institute of Chemistry, Ss. Cyril and Methodius University in Skopje, Skopje, Macedonia*

[b] *Faculty of Natural Sciences and Mathematics, Institute of Biology, Ss. Cyril and Methodius University in Skopje, Skopje, Macedonia*

[c] *Friedman Diabetes Institute at Lenox Hill Hospital, Northwell Health, 110 E 59th Street, Suite 8B, Room 837, 10022 New York, NY, USA*

**j_b_bogdanov@yahoo.com*

Breast cancer is the most prevalent malignancy in women worldwide and is heterogeneous and highly complex in nature. Curcumin, owing to its pleiotropic molecular structure and recognized bioactivities, has established its role in anticancer research. Regarding curcumin's limiting factors from therapeutic applicative aspect, the monocarbonyl analogs of curcumin (MACs), possessing improved pharmacological properties, offer promising prospect for the development of new anti-breast cancer agents.

Guided by our previously built quantitative structure-activity relationship (QSAR) model[1] novel and previously reported MACs with different central cores and ring substituents were designed and synthesized. The cytotoxicity of selected compounds against the MCF-7 breast cancer cell line was evaluated using an MTT assay. The viability values obtained for the cell line under the influence of various MACs were in the range of 2 – 76 %. This confirmed the influence of structural features on the anticancer activity of the molecules. Furthermore, the experimental results were in accordance with the QSAR trend, and both reflected the inhibitory activity of curcumin analogs on the survival and proliferation of breast cancer cells *in vitro*. In conclusion, MACs represent a promising chemical architecture with anticancer potential.

Keywords: monocarbonyl analogs of curcumin; QSAR; MTT; MCF-7; anti-breast cancer

References

1. Todorovska, I.; Dragarska, K.; Bogdanov, J. A Combined 2D- and 3D-QSAR Study, Design and Synthesis of Some Monocarbonyl Curcumin Analogs as Potential Inhibitors of MDA-MB-231 Breast Cancer Cells, *Chem. Proc.* **2022**, *12*, 5. DOI: 10.3390/ecsoc-26-13572