Investigating novel quinoxaline derivatives as potential apoptoticinducers and anticancer agents

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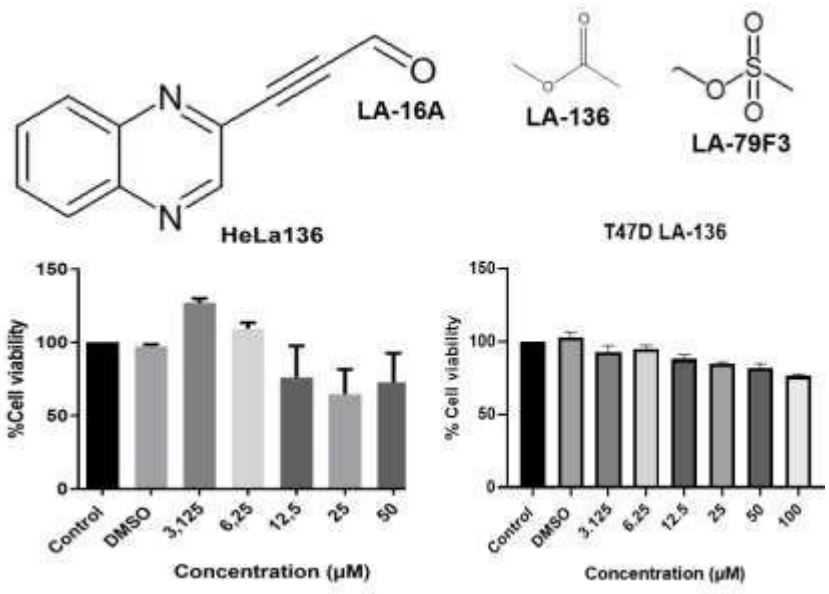

Fig 1: The effect of quinoxaline derivatives on cervical and breast cancer cell viability.

Introduction: Cancer is a major health and socio-economic problem in South Africa and the second most cause of mortality worldwide. Breast and cervical cancer remain the most diagnosed cancers in females in South Africa with limited available treatment options that are accompanied by undesirable side effects and poor prognosis. In the current preliminary research, a novel cohort of quinoxaline derivatives (LA-16, LA-136 and LA- 79F3) designed to possess a wide spectrum of biological activities inclusive of anti- proliferative, pro-apoptotic and oxidative stress modulation abilities were synthesised with promising targeted and selective anti-cancer drug activities.

Method: In order to investigate the antioxidant properties of the quinoxalines ferric reducing power assay and DPPH free radical scavenging activity was performed. Morphological analysis, cell viability and nuclear integrity of the cells were also evaluated.

Results: Results showed that LA- 136 and LA-79F3 induced cell death and pronounced morphological changes in HeLa cervical and T47D breast cancer cells, respectively.

Discussion and conclusion: With more insight on their modes of action, new therapeutic targets may be revealed and this will provide potential approaches to overcome the problem of drug resistance and to mitigate or avoid toxicity.Thus, it can be concluded that LA-136 and LA-79F3 can be further investigated as potential anticancer agents for cervical and breast cancer treatment. References: Sibiya, M.A., Raphoko, L., Mangokoana, D., Makola, R., Nxumalo, W. and Matsebatlela, T.M. 2019. Induction of cell death in human A549 cells using 3-(quinoxaline- 3-yl) prop-2-ynyl methanosulphonate and 3-(quinoxaline-3-yl) prop-2-yn-1-ol. *Journal of Molecules.* 24:2.

Key words: breast cancer, cervical cancer, quinoxaline derivatives, apoptosis.