Immunomodulation-Mediated Anticancer Activity of a Novel Compound from *Brugmansia suaveolens* Leaves

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Abstract:

Immunomodulation activity-guided fractionation of ethanol extract of *Brugmansia suaveolens* leaves was carried out to isolate a novel compound SUPH036-022A (**1**) by co-culturing the test fraction/compound activated PBMC with MCF7 and A549 cancer cell lines. Assessment of immune markers in PBMC, and analysis of apoptosis markers and cell cycle was carried out for cancer cells. The structure of the isolated compound was elucidated by spectral analysis. Compound **1** enhanced the secretion of immune markers, IL-2 and IFN-γ, from PBMC. Further, compound **1** treated PBMC increased cell death in MCF7 and A549 cell lines and induced ROS production and mitochondrial membrane perturbation, leading to apoptosis. Flow cytometry analysis revealed; compound **1** stimulated PBMC to cause a five-fold increase in cell cycle perturbations in the sub-G1 stage of cancer cells as compared to the negative control. The compound, in the absence of PBMC, only had a weak cytotoxic activity against these cell lines. Thus, compound **1** is a novel lead for immunomodulation-mediated anticancer activity.

Keywords: *Brugmansia suaveolens*; immunomodulation; cancer; bioactivity-guided fractionation; apoptosis.