

**The Role of *bax* and *bcl-2* and Protein Phosphatase Type 2A (PP2A) in the Regulation of Apoptosis in HL-60 Cells.**

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Reversible phosphorylation is a key mechanism for regulating the biological activity of proteins that affects cellular processes including apoptosis and cell-cycle progression. Calyculin-A is an inhibitor of protein phosphatase 2A (PP2A). Previous studies in our laboratory established that lithium induces apoptosis of HL-60 cells at 10 mM and above while calyculin-A induces apoptosis at 1 nM and above. The observed apoptotic effects were synergistic. These observations led to the hypothesis that lithium and calyculin-A exert their biological effects by acting on a similar target. It was, therefore, the aim of this study to establish whether lithium would also exert similar inhibitory effects on the activities of PP2A. We further aimed at delineating the effects of both lithium and calyculin-A on the expression profiles of apoptotic genes. In this study, HL-60 cells were treated with calyculin-A, lithium and the combination of both. This was followed by assessment of cell proliferation and viability. Lithium and calyculin-A were found to inhibit cell proliferation and viability in a time- and dose-dependent manner. Preliminary studies on enzyme activity assays of PP2A showed a concentration- and time-dependent inhibition by lithium and calyculin-A. Further, semi-quantitative RT-PCR analyses of *bax* and *bcl-2* genes revealed aberrant expression profiles under the treatment conditions.