Camel Whey Protein Disrupts the Cross-Talk Between PI3K and BCL-2 Signals and Mediates Apoptosis in Primary Acute Myeloid Leukemia Cells.

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Abstract:

In the present study, we investigated the impact of camel whey protein (CWP) on the survival of primary acute myeloid leukemia (AML) cells that were isolated from 20 patients diagnosed with AML. We found that CWP induced apoptosis in the primary AML cells without affecting the normal PBMCs that were isolated from healthy individuals, as determined by PI/annexin V double staining followed by flow-cytometry analysis. Furthermore, we demonstrated that these primary AML cells exhibited aberrant phosphorylation of AKT, mTOR and STAT3. Treatment of AML cells with CWP mediated significant reduction in the phosphorylation of AKT, mTOR and STAT3. Additionally, we demonstrated that blockade of PI3K/AKT signaling pathway by wortmannin (WM) impaired the expression of Bcl-2 and BclXL in the primary AML cells, suggesting an essential cross-talk between PI3K and Bcl-2 that maintains the survival of AML cells. In this context, treatment of AML cells with CWP disrupted the PI3K/Bcl-2 cross-talk; significantly downregulated the expression of anti-apoptotic Bcl-2 family members Bcl-2 and BclXL; markedly upregulated the expression of the pro-apoptotic Bcl-2 family members Bak and Bax; and subsequently sensitized tumor cells to growth arrest. Our data revealed the therapeutic potential of CWP and the underlying mechanisms against leukemia.

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