The growth inhibitory mechanism of PC-2d in A498 human renal carcinoma cell line

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This study demonstrated the cytotoxic effect and molecular mechanisms of PC-2d, a new synthetic carbazole derivative, in A498 human renal carcinoma cells. A498 cells were treated with different concentrations of PC-2d, the proliferation activity of A498 cells was determined by MTT assay. The results showed that the PC-2d exhibited potent cytotoxicity against A498 cells with IC_{50} value 0.09 μM, in a dose- and time-dependent manner. The morphological change of A498 cells was observed by microscope. Using flow cytometry analysis, PC-2d induced A498 cells apoptosis as demonstrated by the accumulation of the sub-G1 phase. Annexin V/PI double staining demonstrated the presence of apoptotic cells. JC-1 staining analysis showed that PC-2d decreased mitochondrial membrane potential in support of apoptosis. Treatment of A498 cells with PC-2d resulted in significant increased activation of caspase-3, caspase-8 and caspase-9. PC-2d treatment increased protein levels of active caspase-3, caspase-9, Endo G, AIF, cytochrome *c*, but treatment with the compound caused reduced levels of procaspase-3, procaspase-9, and Bcl-2. These results observed that PC-2d could induce apoptosis in A498 cells by both the mitochondrial pathway and death receptor pathway.