



Silica Nanoparticles Sensitize Human Multiple Myeloma Cells to Snake (*Walterinnesia aegyptia*) Venom-Induced Apoptosis and Growth Arrest

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Abstract:

Background. Multiple myeloma (MM), an almost incurable disease, is the second most common blood cancer. Initial chemotherapeutic treatment could be successful; however, resistance development urges the use of higher toxic doses accompanied by hematopoietic stem cell transplantation. The establishment of more effective treatments that can overcome or circumvent chemoresistance has become a priority. We recently demonstrated that venom extracted from *Walterinnesia aegyptia* (WEV) either alone or in combination with silica nanoparticles (WEV+NPs) mediated the growth arrest and apoptosis of prostate cancer cells. In the present study, we evaluated the impact of WEV alone and WEV+NP on proliferation and apoptosis of MM cells. **Methods.** The impacts of WEV alone and WEV+NP were monitored in MM cells from 70 diagnosed patients. The influences of WEV and WEV+NP were assessed with flow cytometry analysis. **Results.** WEV alone and WEV+NP decreased the viability of MM cells. Using a CFSE proliferation assay, we found that WEV+NP strongly inhibited MM cell proliferation. Furthermore, analysis of the cell cycle using the propidium iodide (PI) staining method indicated that WEV+NP strongly altered the cell cycle of MM cells and enhanced the induction of apoptosis. **Conclusions.** Our data reveal the biological effects of WEV and WEV+NP on MM cells that enable these compounds to function as effective treatments for MM.

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