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Cytotoxic Effect of Crocetin Combined with Mesenchymal Stem Cells Isolated from Mouse Bone Marrow in vitro

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ABSTRACT

Introduction: Cancer, the second most prominent factor of mortality, contributes to approximately one-sixth of global fatalities. Regrettably, present chemotherapeutic agents employed in oncology harm healthy cells. Therefore, more effective and non-toxic compounds isolated from natural sources, such as phytochemicals with anticancer activities, need further investigation. In addition, in many studies, mesenchymal stem cells or the supernatant obtained from the culture of these cells have shown anticancer effects. This study aimed to examine the impact of the supernatant derived from the close vicinity of mesenchymal stem cells, which were exposed to varying concentrations of crocetin, on the viability of B16F10 cancer cells in an in vitro environment.

Methods and Materials: At first, the process of isolating mesenchymal stem cells from the bone marrow tissue of a mouse femur was carried out. Subsequently, these cells were then cultured, and their mesenchymal nature was confirmed. Subsequently, these cells were co-cultured with varying concentrations of crocetin plant extracts in distinct plates. Afterward, the resulting supernatant (conditioned media) acquired from this condition was used to treat B16F10 cancer cells cultured in separate plates. Finally, the survival rate of B16F9 cancer cells was assessed through the MTT test. The obtained data was evaluated with the aid of Prism and SPSS software.

Results: For the first time, the results demonstrated that the administration of the conditioned media derived from the co-culture of mesenchymal stem cells with crocetin significantly reduces the viability of B16F10 cancer cells.

Conclusion and Discussion: Our findings indicate that the conditioned media obtained from the co-culture of mesenchymal stem cells and the compound known as crocetin, in a concentration-dependent manner, can be considered a viable therapeutic adjunct to enhance the body's antitumor reactions in the treatment of patients suffering from B16F10 cancer.

Keywords: Bone marrow, Mesenchymal stem cells, Mice, Neoplasms