Analysis of Neuronal-Like Differentiation of Mouse Mesenchymal Stem Cell Line- C3H10T1/2

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Abstract—*Mesenchymal stem cells have been extensively used for cell-based therapies especially in neuronal diseases. Studies still continue to delineate mechanisms involved in differentiating mesenchymal stem cells into neuronal cells as they are not immortal and hence, the number of cells available for experiments is much more limited. Culturing and differentiating of neuronal cell is more challenging as they do not undergo cell division thus, bringing them to differentiation proves to be a difficult task. Therefore, the aim of this study was investigate whether Juglans regia L. (Walnut oil (WO)) differentiates multipotent, C3H10T1/2 cells, a murine mesenchymal stem cell line, into neuronal cells. C3H10T1/2 cells were plated at a concentration of 30,000 cells per/well of six well plates and treated with WO post 24 hours of plating. The treatment was given (with WO treated cultures or without control cultures) at different concentrations of 2.5 µl, 5 µl, 10 µl. The cell cultures were then stained with Cresyl violet acetate solution which was used to stain the Nissl substance in the cytoplasm of the differentiated neuronal culture. The results indicated that the C3H10T1/2 cells differentiated into neuronal-like cells with long outgrowths of axon like structures. Cell in culture were able to take up the cresyl violet acetate stain indicating their preliminary differentiation into neuron-like morphology with WO treatment. Therefore, treating the mesenchymal stem cells can in future establish a cultured mesenchymal stem cell line as neuronal differentiating cell line model. In conclusion, treatment of C3H10T1/2 cell line with WO induced the lineage to shift toward neuronal-like cells.*