

esis and inflammation was assessed by measuring VEGF and TNF α secretion in media using ELISA.

Results: MTT assay showed that in all of the culture conditions there was an increasing trend in the number of the cells with time. Comparison between control and hyperosmotic conditions showed higher expression of collagen type 2 in hyperosmolar groups. RT-PCR results showed expression of Col II was up regulated in all hyperosmotic groups in comparison with Iso-osmotic condition. MMP9 gene was down regulated in all hyperosmotic conditions.

Conclusion: Hyperosmolarity enhances the expressions of chondrogenic markers, regardless of the type of osmolyte used.

Keywords: MSC, Stem Cells, Chondrogenesis, Osmolarity

Ps-9: Legal Challenges in Stem Cells Application: Codifying Legal Codes

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Objective: Stem Cells are indistinctive cells, which because of their capability to repair and self-treatment as well as the capacity of dividing into various types of cells, are regarded as an important issue of study. These cells are studied by scientists both in order to cure diseases and to research and study new diseases and treatments. This technology has been always challenged by a broad set of issues and discussions around the world. The treatment application of stem cells although is done after a long process of testing and studying, it has a short age and its results have not been discovered so far. In many cases, the treatment operations are only regarded as researches, for instance nobody knows what permanent effects a stem cell (especially from a strange one) affects on a human body. Also there are many factors about the beginning and prevalence of a disease and we cannot get a decisive conclusion only based on testing limited cases. In security, the first important thing is that the stem cell must be relief of any kind of cancer cells, virus, bacteria, etc. The second is that if stem cells remain in the same place they enter or move to other body tissues and make a new clone. The last but not least is that will these cells remain in the patient's body in 30 years without risk and dozens of questions must be observed in legal issues. It seems that the legal discussions related to the research and application of stem cells should be to the extent of scientific advances of the field and with logical balance in these two areas, we can ensure the health of society and not harm the patients.

Materials and Methods: Our method in the present article is to clarify questions and effects of treatment cells and express a set of strategies to develop binding rules, i.e. legal codes.

Results: Codifying legal codes would, in one hand, support the researches and professional centers and, in other, would protect the health and fundamental laws of human bodies and observe the moral, international and national guides.

Conclusion: Codifying legal codes would, in one hand, support the researches and professional centers and, in other, would protect the health and fundamental laws of human bodies and observe the moral, international and national guides.

Keywords: Stem Cells, Law, Codes, Treatment, Patient

Ps-10: Studying The Effect of Thymoquinone on Mouse Bone Marrow-Derived Mesenchymal Stem Cells Viability *In Vitro*

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Objective: Thymoquinone (TQ) is a volatile compound of some medicinal herbs. Despite extensive studies on the biological and pharmacological effects of TQ, but there is no report on its effects on stem cells, especially mesenchymal stem cells (MSCs). Given the importance of immunomodulatory properties of MSCs, as well as their applications in tissue regeneration, and also the pro-/anti-oxidant and immunomodulatory effects of TQ, it can propose that this compound may affect the behavior and function of MSCs. The present study was designed to investigate the effect of TQ on mouse bone marrow-derived MSCs viability *in vitro*.

Materials and Methods: MSCs were isolated from 4-8 week mice and were cultured in DMEM supplemented with FBS. The identity of the cells was confirmed by differentiation assays into osteoblasts and adipocytes. The effect of different concentrations of TQ (0.125, 0.25, 0.5, 1, 2, 4, 8, 16, 32, 64 μ g/ml) on MSCs viability was determined by MTT assay at 24, 48, and 72h. Furthermore, morphological changes of the treated MSCs were evaluated under an inverted microscope.

Results: The results of this study showed that TQ induced a distinct dose- and time- dependent diminution of MSCs viability. The IC50 values of TQ on MSCs were determined as 8 μ g/ml after 24h, and 4 μ g/ml after 48 and 72h. Morphological observations also revealed that TQ reduced the number of MSCs in a dose- and time- dependent manner and prominent morphological changes were common after 24h of treatments with 4 μ g/ml of TQ, compared with untreated controls.

Conclusion: This study indicates that TQ had less toxicity on MSCs at low concentrations, thus it can propose that this compound may affect proliferation, migration and immunomodulatory properties of the cells. It may also induce pre-/anti-inflammatory phenotypes in MSCs, which can affect immune system and thus MSCs applications in regenerative medicine, however, different studies are required to support these effects.

Keywords: Thymoquinone, Mesenchymal Stem Cell, Viability, MTT Assay

Ps-11: Studying The Effect of Osmolarity on Chondrogenic Differentiation of Human-Mesenchymal Stem cells

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