

Curcumin, the main compound of spice turmeric- as one of the natural products- was demonstrated to possess effective anti-cancer properties, with no significant effect on normal cells. Also many studies have been accomplished using curcumin for diabetes treatment. Therefore we based the main aim of this study on improving the efficiency of differentiating human MSCs into IPCs utilizing polymeric nanocurcumin. The absorption efficacy of curcumin is too low to make dramatic results in therapy. Curcumin bioavailability could be improved using nanoparticle carriers. Our data indicates that polymeric nanocurcumin -in specific dose and time- reduces the expression of nestin (protein coding gene, expressed in IPC progenitors) with no significant effect on insulin expression in mRNA and protein level.

**Keywords:** Diabetes type I, Regenerative Medicine, MSCs, IPCs, Polymeric Nanocurcumin.

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#### Abstract No.107

##### Electrochemical Investigation of Hemoglobin via Gold-Coated Magnetic Nanoparticles

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Using direct electrochemistry of redox proteins it is possible to establish a foundation for fabricating the mediator-free biosensors. In the last few years, by development of nanotechnology, magnetic gold nanoparticles as especial carrier for immobilizing biomolecules have aroused great interest. Among the various protein immobilization approaches, the technique based on electrostatic interactions has much attention due to their facility and wide availability of materials. The direct electron-transfer of hemoglobin (Hb) immobilized on magnetic gold nanoparticles was achieved. Magnetic gold nanoparticles were dropped on the surface of Au electrode and hold on it by using magnet behind electrode. The cyclic voltammograms (CVs) of Hb, heme and globin on gold nanoparticles were obtained in phosphate buffer solution (pH 6.8) and air saturated conditions. Hb showed a quasi-reversible CV corresponding to the Fe<sup>3+</sup>/Fe<sup>2+</sup> redox couple with a formal potential of about -0.33 V (vs. Ag/AgCl). The immobilized Hb exhibited good electrocatalytic activity toward hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>). The gold nanoparticles provided a biocompatible micro-environment for protein and could promote the

direct electron transferring of Hb. This method may also be examined to other proteins too.

**Keywords:** Gold Magnetic Nanoparticles, Hemoglobin, Globin, Heme, Direct Electron Transfer.

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#### Abstract No.108

##### Cloning and Sequencing of Endoglucanase Gene from a Native Strain of Bacillus spp.

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An endoglucanase producing strain of Bacillus spp. was isolated from the forest soils of Ardabil province. The 16S rDNA was amplified using universal primers and the sequencing results were analyzed by nucleotide Basic Local Alignment Search Tool. The data showed that the strain was Bacillus pumilus. A pair of primers was designed according to upstream and downstream sequence of the gene using bacteria genome (NCBI ACCESSION: AY339624) as template, and the gene was amplified using standard three-step PCR reaction. A specific 2200 bp DNA band was amplified and purified from agarose gel. The DNA was cloned into pTG19 vector using T/A cloning method and transformed into E. coli DH5a. The recombinant vector was extracted and sequenced. The results confirmed the endoglucanase gene with two distinct domains of glycosyl hydrolase family and cellulose binding domain which was followed a signal peptide in the 5' end.

**Keywords:** Bacillus spp., Endoglucanase Gene, PCR Amplification, Cloning.

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#### Abstract No.109

##### Lung Cancer Tumors Classification by Using Data Mining Tools on Important Protein attributes Derived from Structural and Physicochemical Descriptors Of Involved Proteins

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