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CHARACTERIZATION OF SMOOTH MUSCLE DIFFERENTIATION OF PURIFIED HUMAN SKELETAL MUSCLE DERIVED CELLS FOR UROLOGICAL REGENERATION

Hypothesis / aims of study

The purpose of this study is to characterize the smooth muscle differentiation of purified human skeletal muscle derived cells (hMDCs) for bladder reconstitution and management of stress urinary incontinence .

Study design, materials and methods

The isolation and purification of hMDCs were conducted by modified preplate technique and Dynal CD34 cell selection. Smooth muscle cell differentiation was induced by the use of smooth muscle induction medium (SMIM) and low serum medium. The gene expressions at the mRNA and protein levels of undifferentiated and differentiated hMDCs were tested by RT-PCR, western blot and immunofluorescence studies.

Results

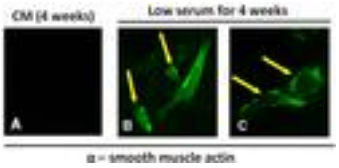
Western blot and immunofluorescence studies demonstrated the purified hMDCs cultured in SMIM for 4 weeks expressed significant amount of smooth muscle myosin heavy chain (MHC) and alpha-smooth muscle actin (ASMA). The cells cultured in low serum medium for 4 weeks also expressed ASMA, while the control group did not. RT-PCR analysis showed increased gene expression of smooth muscle markers, such as ASMA, Calponin, SM22, Caldesmon, Smoothelin, and MHC when purified hMDCs were exposed to SMIM for 2 and 4 weeks when compared to the controls.

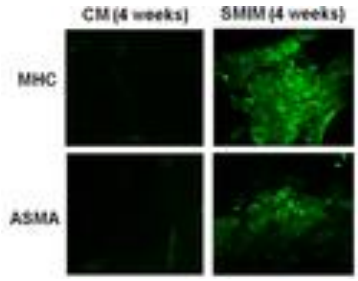
Interpretation of results

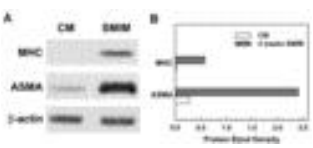
The smooth muscle differentiation of purified human MDCs was justified. These cells may be used for potential biomaterials for bladder reconstitution and the treatment for stress urinary incontinence in the future.

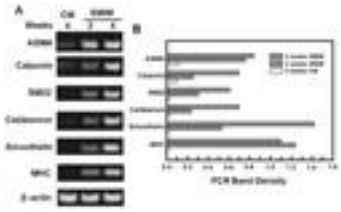
Concluding message

We confirmed the smooth muscle differentiation capability of purified hMDCs. The gene expression of smooth muscle differentiation of purified hMDCs was characterized. These cells may be potential biomaterials for human tissue regeneration.









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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**IRB of Taipei-Veterans General Hospital in Taipei Taiwan with the IRB number: VGHIRB No: 92-11-07A**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**