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Characterization and transdifferentiation of human mesothelial progenitor/stem cells of the peritoneum cavity

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Abstract

Mesothelial progenitor cells have been reported to reside in either the monolayer of mesothelium, submesothelium or within the peritoneal cavity as free floating cells. A putative plasticity has been suggested for these cells as an epithelial to mesenchymal transition and transformation into myofibroblasts and smooth muscle have been suggested. In order to investigate the plasticity and nature of mesothelial cells, cell populations from peritoneal dialysis fluid of early stage non-peritonitis patients were first screened for dominant marker determination by RT-PCR and immunofluorescence. Then, cell colonies were isolated by culture and FACS using HBME-1 and CD34 markers. Efficacy of cell colony isolation by the mentioned methods was validated by flow cytometry. Later, specific media for the differentiation of the mesothelial colonies were defined. The culture of mesothelial cell colonies in knockout serum cultures containing specific growth factors showed a surprising but a relatively low yield of differentiation capacity along extra mesodermal lineage directed to neurons. This was evident by morphological characteristics of neurons and expression of neuronal specific cell markers consisting of the immature neuron markers Tubulin III and Nestin and also the structural neuronal marker Neurofilament 200 as revealed by Western blot. This study could completely violate the previously assumed plasticity of mesothelial progenitor cells and lead us to the definition of a new source of adult stem cells. © 2007 Asian Network for Scientific Information.

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Author keywords

CD34+; HBME-1; Peritoneum; Stem cells; Transdifferentiation

Indexed Keywords

EMTREE drug terms: CD31 antigen; CD34 antigen; CD38 antigen; growth factor; HBME 1 protein; nestin; neurofilament protein; Thy 1 antigen; tubulin; tumor marker; unclassified drug

EMTREE medical terms: article; cell culture; cell differentiation; cell isolation; cell lineage; cell population; cell structure; cell transformation; controlled study; culture medium; epithelium cell; flow cytometry; fluorescence activated cell sorting; human; human cell; immunocytochemistry; immunofluorescence; mesenchyme cell; mesoderm; mesothelium cell; myofibroblast; nerve cell; peritoneal cavity; peritoneal dialysis; peritoneal fluid; peritoneum cell; plasticity; protein expression; reverse transcription polymerase chain reaction; smooth muscle fiber; stem cell; validation study; Western blotting

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