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(54) Title: A NOVEL POPULATION OF MULTIPOTENT CARDIAC PRECURSOR CELLS DERIVED FROM HUMAN BLASTOCYSTS DERIVED STEM CELLS

(57) **Abstract:** A novel population of multipotent cardiac precursor (MCP) cells derived from human blastocysts derived stem cells is disclosed, methods for the preparation thereof and use of the cells for in vitro testing. Basement cells derived from hBS cells are also disclosed and method for the preparation of MCP cells from basement cells. The MCP cells have the following characteristics i) at least 1 % of the cells exhibit no antigen expression of one or more markers for undifferentiated cell, the marker being selected from the group consisting of SSEA-3, SSEA-4, TRA-1-60, TRA-1-81 and Oct-4, ii) at least 1% of the cells exhibit no protein expression of one or more of a neural marker including nestin or GFAP iii) at least 1 % of the cells exhibit protein and/or gene expression of one or more of a mesodermal marker including brachyury, vimentin or desmin iv) at least 1% of the cells exhibit protein and/or gene expression of Flk-1 (KDR). Furthermore, the MCP cells have a characteristic morphology. They grow as clusters of small, round and phase-bright cells; individual cells are 5-20 μm in diameter and each cluster is composed of 2-500 cells. They form clusters of round or elongated shape, that appear as loosely adherent cell clumps that as illustrated in figure 2 panel a, b and c. Furthermore, they have a relatively high nucleus-to-cytoplasma ratio, e.g. 1 :2 - 1 :64 of the total volume of the cell and/or appear as balloons on a string, as illustrated in figure 18, schematic sketch. Moreover, the MCP cells are non-contracting.

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