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BIOLOGICAL CHARACTERISTICS OF HUMAN URINE DERIVED STEM CELLS

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As potential seed cells, urine-derived stem cells (USCs) have a distinct advantage in non-invasive acquisition. In the past four years, we developed a strategy to isolate and cultivate stem cells from urine directly and explored their possible application in tissue injury repair. We compared the biological characteristics of USCs with adipose-derived stem cells (ASCs). We examined the growth rate, surface antigens, and differentiation potential. USCs showed robust proliferation ability, expressed mesenchymal stem cell surface markers, retained normal karyotypes after serial propagation, could differentiate toward the osteogenic, chondrogenic, adipogenic and neurogenic lineages. In rat brain, human USCs were able to survive, migrate and express proteins associated with neural phenotypes. In a recent donor-matched comparative study, we compared USCs and bone-marrow mesenchymal stem cells from the same donor and found out USCs have their specific markers. The results of our study demonstrate that USCs have multilineage differentiation potential, can differentiate to neuron-like cells in rat brain, and it is possible to purify USCs through their specific markers for further application in tissue engineering and regenerative medicine.

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