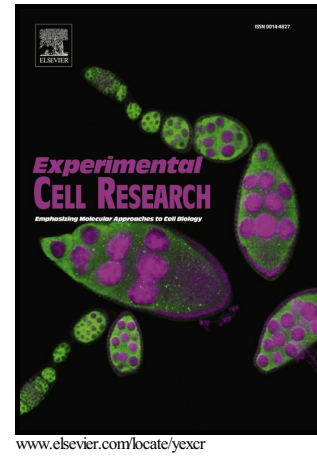


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Energy metabolic capacities of human adipose-derived mesenchymal stromal cells *in vitro* and their adaptations in osteogenic and adipogenic differentiation

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Abstract

Mesenchymal stromal/stem cells (MSC) are important in tissue homeostasis and regeneration due to their ability for self-renewal and multipotent differentiation. Differentiation, as well as proliferation, requires adaptations in the cell metabolism. However, only few data exist concerning the energy metabolism of non-differentiating and differentiating MSC. In this study we compared capacities of major energy metabolic pathways of MSC from human adipose tissue (adMSC) *in vitro* in the non-differentiated state with those of osteogenically or adipogenically differentiating adMSC. To this end we quantified the proliferation and differentiation status of adMSC and analyzed maximum enzyme capacities and several enzyme isoforms of major energy metabolic pathways regarding their activity and gene expression. We could show that non-differentiating and osteogenic cultivation conditions induced proliferation and showed increasing capacities of the glycolytic marker enzyme phosphofructokinase as well as the marker enzyme of the pentose phosphate pathway glucose-6-phosphate dehydrogenase. Adipogenic stimulation,

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