

**Mathematisch-Naturwissenschaftliche Fakultät**

**Institut für Biowissenschaften**

**Fachgebiet: Zellbiologie**

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***Energy metabolic configuration of human adipose tissue-derived cells and its changes due to in vitro culture with osteogenic and adipogenic differentiation***

Adipose tissue is known to be a source of adult mesenchymal stem/stromal cells with high regenerative potential. In the present work the energy metabolic phenotype of the following distinct cell populations from adipose tissue was characterized: native adipocytes and CD34<sup>+</sup> cells of the stromal vascular fraction directly after isolation as well as primary mesenchymal stem/stromal cells after *in vitro* cultivation and osteogenic and adipogenic differentiation. It has been shown that osteogenic differentiation, that was accompanied by an increase of proliferation potential appeared along with an increasing metabolic capacity in general and an increasing glycolytic metabolism in specific. The cells that were stimulated to differentiate adipogenically showed a reduced proliferation potential that was accompanied by an increased oxidative capacity. Especially the mitochondrial metabolic pathway of lipid oxidation displayed increased capacities of its marker enzyme.