# Gangliosides and Adipose Mesenchymal Stem Cells Adipogenic Differentiation

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Adipose tissue has been shown to contain a population of cells that retain a high proliferation capacity in vitro and the ability to undergo differentiation into multiple cell lineages. These cells are referred to as mesenchymal stem cells from adipose tissue (MSC-TA). Gangliosides, sialic acid-containing glycosphingolipids, are present in surface membranes of cells and play a role in cell growth regulation, cell surface interaction, cell differentiation, and transmembrane signaling. Changes in ganglioside composition occur during embryonic development, lactation and cancer cell differentiation. It is not known, however, whether ganglioside compositional changes during MSC differentiation. This study examined the ganglioside expression during the adipogenic differentiation of human MSC-TA. Semi-confluent MSC-TA differentiated or not into adipocytes were incubated with [$^{14}$C]-galactose for 12h. After, gangliosides were extracted, examined by HPTLC. The radioactive sphingolipids were visualized by autoradiography and quantified by densitometric scanning. The major glycosphingolipids of MSC-TA are GM1, GM3, GD2 and GD1a from a-series and GD3 from b-series gangliosides. The MSC-TA differentiated into adipocytes showed essentially the same gangliosides profile. Immunocytochemistry studies demonstrated that GM1, GM3 and GD2 are localized on the plasma membrane with a strong labelling in the perinuclear region. In addition differentiation of MSC-TA into adipocytes revealed the presence of gangliosides in the membrane structure surrounding lipid droplets. It would be important to study the composition of the lipid droplets as well as the interaction of gangliosides with proteins and membrane macromolecules surrounding the droplets in the future.

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