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Comparison of Gangliosides of Human Skeletal and Heart Muscles by Immunostaining on Thin-Layer Chromatograms

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Aim: Determination of the ganglioside composition of human skeletal and heart muscles.
Method: Comparative thin-layer chromatography (TLC) immunostaining of gangliosides with highly specific poly- and monoclonal antibodies, as well as the GM1-specific choleragenoid, was used for the overlay assays, combined with preceding neuraminidase treatment of gangliosides on TLC plates.
Results: GM3(Neu5Ac) was the major ganglioside, constituting almost 70% of all the skeletal and about 50% of cardiac muscle gangliosides. GM1a-type gangliosides (GM1, GD1a, GD1b and GT1b), as well as neolacto-series ganglioside IV3Neu5Ac-nLcOse4Cer, showed quantitative differences in the analyzed muscle tissues. Both displayed more complex patterns in cardiac muscle. GM2 was found only in skeletal muscle, while GM3(Neu5Gc), GD3 and GM1b-type gangliosides (GM1b and GD1a) were undetectable in both tissues.
Conclusion: Human skeletal and heart muscles, although both belonging to the striated muscle tissue, significantly differ in the ganglioside composition, which is probably a result of the difference between their metabolic profiles and the contraction processes they perform.

Key words: antibodies; chromatography, thin layer; glycosphingolipids; heart; muscles