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To
Univerzita Pardubice
Fakulta Chemicko-Technologicka
Doc. Ing. Jan Fischer, CSc.
Head of the jury for defence of PhD Thesis in
branch "Analytical Chemistry"

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**Review of the PhD Thesis „Comprehensive Analysis of Glycosphingolipids in Biological Samples using HPLC/MS“ presented by
Mgr. Karel Horejsi**

The PhD Thesis, presented by Mgr. Karel Horejsi, deals with an improved and more comprehensive analysis of lipids and glycosphingolipids derived from human plasma and tissue including tumor with the goal to use the established methods for patient screenings and to identify new tumor markers that might enable earlier diagnosis.

Mgr. Karel Horejsi presents a cumulative PhD Thesis derived from 2 original publications with him as first author, one original publication with him as co-author and one review with him as first author.

In his original work as first author, he first established a HILIC-ESI-MS/MS based method for the semi-targeted detection of intact glycosphingolipids from human plasma. This method enabled him to identify over 150 GSLs from not more than 250 µL of human plasma, more than reported ever before. Thereafter he set up an improved method to extract and detect the carbohydrate head groups of complex glycosphingolipids from human pancreatic tissue to reveal differences between normal and tumor tissue. With this method, he identified a series of complex carbohydrates with 4 to 7 sugar moieties, often carrying blood group epitopes. With detailed interpretation of the derived MS/MS data, he could assign corresponding oligosaccharide structures. This enabled him to realize a switch in glycolipid series from neolacto- to lactoseries in pancreatic tumors, which indicates a change in the expression of corresponding glycosyltransferases and may point to a potential new target for future cancer therapy in this deadly disease.

His cumulative PhD-thesis very clearly introduces to a very broad overview of analytical methods to purify, detect, identify and quantitate lipids and glycolipids and summarizes the excellent findings of his publications in a broad context of current literature.

His work very well meets formal, linguistic, and scientific standards.

Therefore, I recommend to accept his PhD thesis for defense.


Roger Sandhoff

Foundation under Public Law

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