

**CHARLES UNIVERSITY
FACULTY OF PHARMACY IN HRADEC KRALOVE**

Department of Organic and Bioorganic Chemistry

Study program: Pharmacy

Opinion of the Opponent of the Diploma Thesis

Year of the defense: 2024

Student: **Mohammadreza Shojaei**
Thesis Tutor: PharmDr. Lukáš Opálka, Ph.D.
Consultant: PharmDr. Pavla Jančálková
Opponent: PharmDr. Lukáš Lochman, Ph.D.
Thesis title: **Quantification of skin lipids in mouse model of induced psoriasis**

Scope of work, number of 62 pages, 25 figures, 0 tables, 98 citations

Evaluation of the work:

- | | |
|---|-----------|
| a) Processing of the theoretical part: | Excellent |
| b) The complexity of the methods used: | Very good |
| c) Preparation of the methodological part (clarity, comprehensibility): | Very good |
| d) The quality of the experimental data obtained: | Excellent |
| e) Processing of results (clarity): | Excellent |
| f) Evaluation of results, including statistical analysis: | Excellent |
| g) Discussion of results: | Excellent |
| h) Clarity, conciseness, and adequacy of conclusions: | Excellent |
| i) Meeting the objectives of the work: | Excellent |
| j) Quantity and up to date of references: | Excellent |
| k) Language level (stylistic and grammatical level): | Excellent |
| l) Formal level of the work (text structure, graphic design): | Excellent |

I recommend the thesis for recognition as a rigorous thesis

Comments on the evaluation:

Mohammadreza Shojaei completed his diploma thesis under the supervision of Dr. Lukáš Opálka at the Department of Organic and Bioorganic Chemistry (FAF UK). The main aim of the thesis was to investigate the effect of exogenous Acylceramide applied via topical cream in a mouse model with induced Psoriasis. Further, the ceramide profile in the stratum corneum of healthy mice and mice with induced Psoriasis was compared, and selected ceramide subclasses were analyzed by LC-MS/MS instrumentation and evaluated.

Regarding the formal aspect of the work, I observed minimum typographical errors, and the thesis is thoroughly written. Regarding clarity, the work lacks tables, and sometimes the graphical illustration will be suitable, e.g., the design of the experiment with mice. On the other hand, the theoretical part is written clearly and appropriately. The experimental section is clearly written, except for the method of quantification of selected analytes. MRM transitions of the analytes were not mentioned as well. The results were presented in graphs and widely discussed in reference to previously published research. In my opinion, the model chromatogram is missing. The references were consistently styled and properly cited.

The Theses similarity check shows a cumulative similarity of 23% (44 records, maximal similarity <7%). The Turnitin system indicates a cumulative similarity of 34% (212 records, maximal similarity <2%), including the matches found in the list of cited literature. Both similarity protocols were carefully examined, and I note that the matches found are insignificant and located in the understandable parts of the work.

Therefore, I deem this thesis an original work and highly recommend it for the defense.

Questions and comments to student:

What enlargement was used in the Cryo-electron microscopy picture (Figure 1)?

What are the key differences between the human and mouse stratum corneum? Is the mouse model suitable for the study of the skin and subsequent extrapolation to human skin?

Chapter 3.2 (Page 20). How was the protein content measured? The procedure of protein content evaluation is missing!

Page 21. The preparation for mobile phases A and B is missing; please describe it! What was the gradient elution profile in time? The description of the gradient is insufficient. The temperature of the column thermostat is not mentioned.

Can you show the model chromatogram with the retention behavior of the analytes and the example of MRM transition?

Chapter 3.4.1 (Page 21). What volume of the mixture CHF/MeOH (1:9, v/v) was added to the individual ceramide components?

Chapter 3.4.1 (Page 21). Explain your sentence: This concentration was used for the subsequent calculations in the quantification of ceramides. What was the method used for quantification? What are the differences between the quantification using internal and external standards?

Chapter 4.1. (Page 23). Please explain the design of the combination of the stripes in the sentence: Eight of these strips were subsequently combined into four pairs (1+2, 3+4, 5+6, and 7+8) for further measurements and analysis.

Evaluation of the thesis: Excellent

**For the
defense: Recommend**

In Hradec Kralove

13. září 2024

signature of the opponent