

CHARLES UNIVERSITY
FACULTY OF PHARMACY IN HRADEC KRALOVE

Department: of Pharmaceutical Technology Master's degree program in Pharmacy

Opponent's review of Master's thesis

Student's name: Andrea Suther Bunes

Mentor of the thesis: assoc. prof. PharmDr. Zdenka Šklubalová, Ph.D.

Year of the thesis
defense: 2021

Opponent of the thesis: PharmDr. Barbora Vraníková, Ph.D.

Title of the thesis:

Study of the influence of hydrophilic carriers on the dissolution rate of a BCS II drug

Formal comments: number of pages: 72, number of figures: 21, number of tables: 9, number of references: 72.

Type of work: Experimental work

- a) The aim of the thesis is: Fulfilled
- b) Language and graphic level: Very good
- c) Processing of the theory: Very good
- d) Methods description: Excellent
- e) Results description: Excellent
- f) Discussion and conclusions: Very good

I recommend Diploma thesis for the recognition as Rigorous thesis .

Opponent's comments:

The submitted diploma thesis is focused on the preparation of interactive mixtures with the main aim to improve the dissolution rate of poorly soluble drug (meloxicam). Lactose was utilized as a carrier material, while chitosan was added to minimize the formation of agglomerates.

The theoretical part of the thesis characterizes the solubility and dissolution rate and describes in detail the ordered mixing. This part is well written; however, the excessive repetition of given information may be observed.

The experimental section is standardly divided into materials, equipment, methods and result and discussion. The methods are described sufficiently. In my opinion, the discussion section could be extended by comparison of obtained results with the available scientific studies.

Questions:

Formal comments:

- (page 2) instead of "signature of student" the student's name should be given

- the abbreviation BCS is used throughout the text (even in the title) without its explanation; similarly, the abbreviation used in Figure 1 is missing even in the list of abbreviations
- several typos and grammatical errors may be observed throughout the text (e.g. self-emulsification instead of self-emulsifying)
- the word of Latin origin should be given in italic (e.g., *in vivo*)
- inconsistent links to figures throughout the text
- different font style in the capture of figure 4
- incorrect link to the equation on page 41 (1 instead of 7)
- the stated values in the discussion part are given without the SD
- there are missing values on the y-axis in Figure 21 (only 0.0 is given)
- inconsistent usage of the decimal point (comma vs point/dot)

Question regarding theoretical part:

1. On page 13 Handen solubility parameters are given. Similarly, Lipinski et al. defined Lipinski's rule of 5. Can you specify this rule?
2. Figure 1 is describing the 4 basic classes of BCS. This classification was recently extended to 5 classes. Can you please define the difference?
3. (page 19) Can you provide an example of a lipid-based formulation with cosolvents?
4. (page 21) Which methods are used to determine contact angle?
5. On page 23 you stated that the dissolution will decrease as the drug concentration in the medium is nearing saturation concentration. How this problem may be solved during the dissolution testing?
6. (page 27) What is the difference between deaggregation and deagglomeration? Can be agglomerates deaggregated?

Question regarding experimental part:

1. Why the amount of 10.5 mg of the sample was used for the dissolution testing?
2. The selected concentrations to prepare a standard stock solution, as well as solutions for the evaluation of calibration curves, are atypical. Can you explain their selection?
3. Is there a risk of drug precipitation after dilution of its methanol solution with buffer?
4. (page 46) Why you consider the utilization of a large amount of media (660 mL) as a disadvantage of the flow-through cell method?
5. What can be the reason for incomplete drug release in the case of sample MLX-LACT 1-8 PM and MLX-LACT 1-8 CM?

Evaluation of Master's thesis: Excellent

Recommendations for the thesis defense: Recommended

In Hradec Kralove 25.5.2021

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Opponent's signature