## I. PERSONAL AND STUDY DETAILS

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|---|---|
| Student's name: | **Malherbe   Justin Jehan Du Maur** |
| Faculty: | **Faculty of Biomedical Engineering** |
| Study program: | **Biomedical and Clinical Engineering** |

Personal ID number:  **499492**

## II. EVALUATION OF THE MASTER THESIS

Masters's thesis title in English:

**Cyclodextrin-based nanogel delivery platform for hydrophobic drug delivery**

| | Evaluation criteria | N. of points |
|---|---|---|
| 1. | Fulfillment of the aim of the thesis and suitability of the structure of the thesis with respect to the topic (compliance with the assignment). (0 – 30)*<br><br>Each assignment, or rather any part or sentence from the assignment has to be dealt with, 20 points can only be given for a fully fulfilled assignment. Reduce the number of points with respect to the part of the assignment that is not adequately dealt with. Stating the aim in the introduction is compulsory and if the student fails to state the aim, he/she loses 10 points. The total of 30 points can be granted only to a flawless and precisely prepared thesis. | 22 |
| 2. | Theoretical level and application of accessible sources. (0 – 30)*<br><br>The role of the reader is very important here. It is as follows: if most of the text is adopted, then the student gets only 5 points. If everything is written by the student, in his/her own words, he/she may get maximum 15 points. Additional maximum 15 points can be added for appropriate and complete processing of accessible sources, i.e. state of the art is described in an independent chapter (5 points), important and relevant sources are commented on including the description of the selection process (selection strategy 5 points). All sources are adequately cited. The composition of the cited sources is also judged, i.e. whether they reflect the state of the art and are related to the topic, general sources such as mathematical formulas etc. are not included in full-bodied citations. The ratio of these sources can be calculated i.e. useful / not useful sources and the ration has to have impact on the evaluation (5 points). | 21 |
| 3. | Scope of experimental work (SW, HW) and applied knowledge, quality of the methodology and conclusions of the thesis. (0 – 30)*<br><br>If the thesis is a combination of theoretical deductions (4 points – can be replaced by a paper in English), modelling and simulation (4 points), SW implementation (4 points) and technical realization (4 points – can be replaced by a patent or utility model) and 4 points for functionality of both SW and HW - then the student can get up to 20 points. If the thesis has the correct structure including the discussion (5 points – at least 2 A4 pages) and conclusions (5 points – at least one A4 page) then another 10 points can be added. It means 30 points for a complex and flawless thesis which includes some outcomes in projects, papers, patents or utility models. | 23 |
| 4. | Formal requisites and layout of the thesis (writing mastery, structuring, graphs, tables, citations in the text, list of references etc.). (0 – 10)*<br><br>Currently, students have materials explaining how to prepare a professional text on PC, they have all knowledge and skills; therefore it is not necessary to make allowances for the quality of PC processing. The list of contents of the thesis should have decimal system. Consider references between the individual parts including numbering of equations, pictures, tables and graphs (1 point), quality of pictures (1 point), number of spelling mistakes (1 point for just a few), whether it contains important features with respect to the type of the thesis (2 points). Only standard terminology should be used especially in the English language (ability to express oneself with the use of professional language - 2 points), if graphs are according to the rules (see tolerance and influence of statistical processing – 1 point), if there are relevant captions for graphs and tables and everything is readable (1 point), observance of citation rules ISO690 and ISO690-2 (1 point). | 1 |
| 5. | **Total points** | 67 |

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* Verbal evaluation should be part of the Comments

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## III. PROPOSED QUESTIONS FOR THE DEFENSE (OPTIONAL)

1. Could you briefly descrive "Atypical binding test" mentioned in your thesis?

2. Guideliness for your thesis mention optional characterization of samples by electron microscopy? Was such characterization attempted? If yes, what were the results?

3.

## IV. THE OVERALL ASSESSMENT OF THE LEVEL OF THE MASTER THESIS

| Grade**: | A (excellent) | B (very good) | C (good) | D (satisfactory) | E (sufficient) | F (failed) |
|---|---|---|---|---|---|---|
| Number of points: | 100 - 90 | 89 - 80 | 79 - 70 | 69 - 60 | 59 - 50 | < 50 |
| | ☐ | ☐ | ☐ | X | ☐ | ☐ |

** in case of F (failed) please explain in detail

I give the above grade to the master thesis and I recommend/~~do not recommend~~ it for the defence.

## V. COMMENTS

The thesis is based on cutting-edge research. The student has mastered several methods for the synthesis, functionalization, and characterization of nanoparticles. I am sure that a lot of effort has been put into the work, many dead ends have been reached, and many obstacles have been overcome. It is obvious that the task of synthesizing a novel drug delivery platform is challenging, and the amount of work done is huge. I appreciate the thorough and honest discussion of the experiments that describe all the difficulties and successes in detail.

I have several comments on the content:
I miss the macroscopic description of prepared solutions: how they looked, whether they were clear or opalescent and if some aggregates were visible. I would expect a photograph similar to Figure 3 in [ref1] (Reference is from the same research lab). There is more space in the thesis than in a scientific article, and such data help to make a clearer picture of the experimental results.
The author should explain characterization methods that are not widely known. "Atypical binding test" plays an important role in the thesis, yet I could not find any explanation in the thesis (or elsewhere)

Unfortunately, many minor issues together diminish the overall quality of this work. For example:
- Page 13 contains a paragraph. The same paragraph is by accident repeated o the following page.
- Some illustrations look nice, but they are too small to allow comfortable reading (for example figures 1 and 3,)
- Figures 5 and 6 are not well designed. The arrows are crossing the text, making it confusing.
- The list of symbols and abbreviations is not alphabetically sorted. Seemingly random order reduces the usefulness of the list.
- Some sentences do not make much sense, starting with the very first sentence of the introduction. Some words are used incorrectly e.g. "idyllic synthesis technique". Idyllic means extremely happy, peaceful, or picturesque.
- "Error! Reference source" not found appears three times in the text.

I found a case of incorrect paraphrasing. In general, it is not enough to change the order of the words from the source. But I believe, that this is just an accidental omission and it does not affect the grade I am suggesting.

Text the thesis: "[S]everal antimicrobial drugs are used that inhibit the growth of various pathogenic microorganisms like fungi, bacteria, or viruses that can be produced either naturally, synthetically, or sometimes by chemical modification."

Text in the source: "Various antimicrobials agents have been produced naturally, synthetically, or through chemical, modification to inhibit the growth of various pathogenic microorganisms such as bacteria, fungi, and viruses."

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At this moment I am suggesting a D grade, but I hope that the student will convince the commission that he deserves a better grade.

[ref1] Siebenmorgen, Clio, et al. "Dynamic Covalent Cross-Linked Nanogel-Stabilized Pickering Emulsion for Responsive Microstructures." Macromolecular Rapid Communications (2022): 2100766.

Name and surname incl. degrees: Ing. Václav Petrák, Ph.D.          Signature: .............................................
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