

Prague, January 26, 2022

Review on Master thesis by Hanna Zhukouskaya, B.Sc.

Master thesis „Stability of controlled drug release systems based on plasticized starch“ written by Bc. Hanna Zhukouskaya, B.Sc., is focused on the research of stability of controlled drug release systems based on a blend of plasticized starch/poly(ϵ -caprolactone) (TPS/PCL) that served as a carrier. Antibiotic vancomycin was used as a model drug, and its release from TPS/PCL pellets into aqueous environment was followed by UV-spectroscopy and the obtained time dependences were treated by a simple kinetic model. Moreover, the simultaneous release of starch particles to the surrounding liquid phase was studied by static and dynamic light scattering as well as transmission electron microscopy (TEM) in order to obtain information on the stability of biodegradable matrix and on the structure of the products of the pellet decomposition on a nanoscale level.

The thesis is logically divided and written in good English. I highly appreciate wide interdisciplinary overview of the author, not only the physico-chemical part, but also medical part of introduction is written without any significant factual errors. Results and Discussion section is clearly presented with critical evaluation of the results of multiple types experiments involving different physico-chemical methods. I have only few minor points to discuss within defension, which, however, do not disturb my generally excellent opinion about the thesis:

- 1, The author mentioned that technetium radionuclide can be utilized to visualize bone defects (page 8). In the form of which compound and which radionuclide of technetium is most often used for this purpose?
- 2, Page 17, paragraph just above Table 1: I do not agree with statement „Vancomycin is a concentration-independent antibiotic, ...“. Effect of any antibiotic is concentration-dependent. In the same paragraph, the author perhaps meant range 1-4 mg/L not 1-4 mg/mL.
- 3, Figure 13, page 48: These are probably emission fluorescence spectra? It should be explicitly mentioned whether these are emission or excitation spectra. If these are emission spectra, excitation wavelength should be given in figure caption or somewhere within the picture.
- 5, Figure 19 at page 52: How would volume-weighted distributions look like? Volume-weighted distributions are less straightforward from the physical point of view, but are more important for the biomedical application. Please do not replot the charts, just comment what will be the difference in 1-2 sentences.

I recommend the thesis for defension as a material based on which master degree (M.Sc.) would be awarded to Hanna Zhukouskaya, B.Sc. with suggested rating A-excellent



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