

Review of Ph.D. thesis of Ilkay Karakurt, MSc. with title “Preparation and characterization of saccharide-based antibacterial coatings”

The topic of this thesis is interesting and many laboratories all over the world study polymers for biomedical applications. The experimental work aims to contribute to the field of biomedical applications with the focus on antibacterial properties. The main material is polylactic acid (PLA) that was compressed into a film. The surface of this film was activated by plasma treatment and saccharides were attached to the surface with the help of carbodiimide chemistry. The antibacterial activity and cytotoxicity were evaluated.

The whole thesis consists of 98 pages. In the 42 pages of introduction student well explained the background of the research. Experimental part describes used materials, surface treatment and various characterization methods, such as: X-Ray photoelectron spectroscopy (XPS), UV-Vis Spectroscopy, Scanning electron microscopy (SEM), contact angle measurement, cytotoxicity testing, antibacterial testing, zone of inhibition test.

In the “Results and Discussion” section examples of various results are shown: contact angle, surface by SEM, XPS, biocompatibility, antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* after 24h incubation time.

Conclusion summarizes most important results. In the end 128 references are listed.

I have only one question.

You wrote that PLA can be used for catheters. In my experience PLA is very hard and brittle. Could you explain how can it be used for catheters? I thought that catheters should be soft rubbery tubes.

Altogether this research was performed on high level with great number of experiments. Student has shown the ability to study literature, perform experiments, analyze experiments and summarize them into well-arranged form.

This doctoral thesis does not contain visible flaws and therefore I recommend it for defense.

I have checked the Web of Science and found 4 papers with his name out of which on 2 he is listed as the first author. He has already 20 citations (without self-citation), h-index is 3. I would say that this is more than enough for granting of Ph.D. title.

In Zlin 20.7.2022



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[Ozaltin K; Lehocky M; \(...\); Saha P](#)
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Furcellaran Surface Deposition and Its Potential in Biomedical Applications
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Antibacterial Activity and Cytotoxicity of Immobilized Glucosamine/Chondroitin Sulfate on Polylactic Acid Films
[Karakurt I; Ozaltin K; \(...\); Mozetic M](#)
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[Karakurt I; Ozaltin K; \(...\); Mozetic M](#)
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