



The result of the mid-term assessment together with the justification

Wynik oceny śródkresowej wraz z uzasadnieniem

for the period 01.10.2019 to 31.08.2021

Hanna Orlikowska
 the Doctoral Student at PUT Doctoral School / Doktorant Szkoły Doktorskiej PP
 discipline of science / dyscyplina naukowa: materials engineering / inżynieria materiałowa

The result of assessment / Wynik oceny

Positive / Pozytywna*	Negative / Negatywna*
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Justification / Uzasadnienie

The final assessment of doctoral student is **positive** due to Miss H. Orlikowska achievements in research, activities in results dissemination and other organizational activities, which are as follows:

1. Scientific report delivered by M.Sc. H. Orlikowska in the parts 2&3 proves that realization of her IRP is proportional to the time used for its realization (40%). Some delays (about 10%) were caused COVID-19 pandemic. Miss H. Orlikowska was focused on the developing highly advanced measuring system – modulation transfer microscopy (MDM) for imaging components of biomimetic cell membranes regardless of their fluorescence yield. The main part of the system was constructed and enabled determination of the sensitivity and detection limits. Also trial measurements for a solid supported lipid bilayer (4 nm thick!) were performed as well as collection of fluorescence signal in reflection. M.Sc. H. Orlikowska studied the modulation transfer signal (from 3.3 mM aqueous Atto647N solution) as a function of the modulation frequency as well as a function of the concentration of the investigated aqueous solution of Atto647N. Moreover, the modulation transfer signal was studied, changing the power levels of both pump and probe beams. The obtained results are very promising and suggest the development of a reliable technique to visualize fluorescence-free biomimetic cell membranes. It is also worth to mention Miss H. Orlikowska's hard work on systematic literature studies of recent advances in above mentioned field (MDM) and studies of ultrafast phenomena at the nanoscale. Publication the review paper in Acta Physica Polonica may serve as the best assessment of this work.

She also was very active in realization other tasks in common with other group members. She is co-author of common articles and patents applications.

2. Scientific achievements reported in the Part 4th and other activities directly related to implementation of doctoral dissertation were also positively assessed as Miss H. Orlikowska is the first co-author of 2 articles published in APP A and J. of Molecular Liquids, and co-author of 2 other papers published in the high rank Journals as JACS (including JACS front cover) and Biosensors. She also presented 3 talks and 5 posters during national and international conferences, mostly "on-line" due to Covid-19 pandemic restrictions. It is worth to point out her participation in preparing 2 patents applications. She has successfully applied for two projects as principal investigator, one project devoted to young scientists at PUT and the second (very prestigious) "Diamond Grant" from Ministry of Education&Science.

3. Her Individual Education Program (IEP) was realized fully as Miss H. Orlikowska has gained maximum ECTS points possible to obtain within the first two years of studies at the PUT Doctoral School (27 p.), and she realized appropriate participation in teaching of classes with students. The other internships or practical trainings outside PUT were postponed due to COVID-19 pandemic.

The obtained scientific results up to now, publications and patent applications gives a very good base for the next grant applications as head. We would suggest to apply for PRELUDIUM project at the first turn.

On behalf of the Commission / Za Komisję

September 14th, 2021
 Date

Ryszard Czajka

 Legible signature of Head of Commission
 prof. dr hab. Ryszard Czajka

* delete as appropriate / niepotrzebne skreślić