



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

Madhurima Chattopadhyay

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 PhD student's achievements in research, activities in results dissemination and other organizational activities, which are as follows:

1. Scientific report delivered by M.Sc. M. Chattopadhyay in the parts 2&3 proves that realization of her IRP is proportional to the time used for its realization. The obtained results already explained the hydration-dependence of lipid mobility by correlating it with the change in hydration structure of the lipid head group and changes to the activation energy of diffusion. The research activities of M.Sc. M. Chattopadhyay confirms that the diffusion coefficient (D) of L_d phase lipids decreases with dehydration and increases again with rehydration, proving the reversibility of the process and highlighting the crucial role of water molecules attached to lipids in the mobility of these biomolecules and in turn on the properties of lipid-based membranes mimicking cell structures. Additionally, M.Sc. M. Chattopadhyay discovered that cholesterol redistributes with dehydration preferentially to Liquid Disordered Phase (L_d) than Liquid Ordered Phase (L_o) phase, while L_o is more abundant in fully hydrated conditions. This behavior of cholesterol is fascinating, and it deserves additional investigation. Namely, the important part of research plan was realized, the results interpreted and published in JCR high rank Journals and enabled patents on methods of practicable hydration sensing in biomembranes.
2. Part 4th reporting scientific achievements and other activity directly related to implementation of doctoral dissertation was also positively assessed as Miss M. Chattopadhyay is the first co-author of 2 articles published in the high rank Journals as JACS (including JACS front cover) and Biosensors, and the third co-author of manuscript being delivered to Journal of Molecular Liquids. She also published 2 conference papers, presented 2 talks and 7 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 3 patents applications (as the first co-author in two of them). She also took a part in 5 "on-line" courses organized by Polish and foreign scientific Institutions.
3. Her Individual Education Program (IEP) was realized fully as Miss M. Chattopadhyay has gained maximum ECTS points possible to obtain within the first two years of studies at the PUT Doctoral School 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 grant applications with Miss M. Chattopadhyay 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