

## Research Trip Summary Report

### Task 2. Foreign mobility of WUST doctoral students

#### I. Data of the doctoral student

1. Full name: Olga Kaczmarczyk
2. Year of studies: 2
3. Educational discipline: chemical sciences

#### II. Foreign research trip (research visit)

1. Research institute in which the foreign research was implemented: Massachusetts Institute of Technology
2. Name and surname of the host person (mentor): Frances M. Ross
3. Dates of the research trip: 01.10.2022-30.12.2022
4. Title and date of a seminar delivered during the research trip: *Liquid crystals and their nanocomposites*, 01.11.2022

5. Description of work carried out during the research trip:

Gold nanoparticles transfer optimization (from water to organic solvent); polarizing microscopy characterization of liquid crystals (thermotropic and lyotropic) and their nanocomposites consisting of 4-cyano-4'-octylbiphenyl (8CB) or AOT/p-xylene/water and gold nanorods; preparation of liquid samples for transmission electron microscopy (TEM) using silicon nitride membranes and silicon chips; characterization of nanomaterials and liquid crystalline nanocomposites using TEM

6. Description of the main results obtained:

Gold nanoparticles were successfully transferred from the water solution to toluene using 1-dodecanethiol. The obtained solutions were mixed with 8CB liquid crystal and characterized using polarizing microscopy and TEM techniques. The liquid sample preparation was successful and the liquid crystal was characterized in vacuum-free conditions in bright field and diffraction mode. The work done during the research trip is fundamental for the future observations.

7. Future collaborations (if applicable):

Preparation of the future manuscript.

8. Title and date of a seminar presenting the results of the trip delivered at Wrocław University of Science and Technology after returning from the research trip: *Liquid-cell TEM of liquid crystals and their nanocomposites – the summary of the research trip to MIT*, the results will be presented at the seminar of Institute of Advanced Materials and the date will be provided after the acceptance of the coordinator.



**III. Doctoral student's signature**

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(Date)

.....  
(doctoral student's signature)

**IV. Confirmation and information from the host**

1. Confirmation of compliance of the information contained in the report: I CONFIRM / DO NOT CONFIRM. *(In justified cases, the confirmation of the host may be sent by e-mail to the Dean's Office of the Doctoral School email: [interdocschool@pwr.edu.pl](mailto:interdocschool@pwr.edu.pl))*

2. Additional information and comments

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(Date)

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(signature(s) of Host)