

# OPPONENT REPORT OF THE DIPLOMA THESIS

Name and Surname of the Student: Marta Tomillo Amorós

Topic of Diploma Thesis: Incorporation of hydrophilic/hydrophobic drug into biodegradable nanofibrous materials as drug delivery systems

## Statement of whether the thesis meets the objectives of the assignment

*This thesis compares Direct Current Electrospinning (DCES) and Alternating Current Electrospinning (ACES) for creating nanofibrous membranes in drug delivery systems. Specifically, it explores incorporating curcumin, an anti-inflammatory and anticancer compound, into Polylactic Acid (PLA) nanofibers. Both DCES and ACES were assessed for their effectiveness in fiber formation, morphology, and thermal properties through Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA). While each method shows unique advantages, both produce nanofibers with promising properties for drug delivery. This study enhances the understanding of ACES in drug delivery applications and emphasizes the importance of optimizing electrospinning parameters for effective integration of pharmaceuticals into biodegradable fibers.*

*The theoretical part, as well as the tests and analyses, are sufficient to achieve the study's goal. This study is appropriate for a master's thesis. I have some remarks about introduction theoretical parts:*

*The "literature review" section is written in an unconventional way, particularly in the first three paragraphs. Each paragraph summarizes a single article without comparing or relating the findings to one another or to the current research topic. The author has chosen to include discussion at the end of this section rather than throughout.*

*The "Production Theory" section is unnecessary, as it does not contribute any new information.*

*Overall, the thesis meets the all objectives of the assignment.*

## Evaluation of the content and formal aspects of the thesis

*There are few questions needs to be discussed:*

a) *What is the portion means in "Acetic acid, Formic Acid, and Acetone at 1/1/1 proportion".*

*In the experimental part, what is the portion means in „Acetic acid, Formic Acid, and Acetone at 1/1/1 proportion“? 10 wt% PLA dissolved in a 1:1:1 mixture of Formic acid FA, acetic acid AA, and acetone, is it wt./mL or wt./wt. ?*

*b) In experimental part, curcumin was added at 10, 25, and 50 wt% concentrations. Is it 50% wt. of PLA or 50% wt./wt of whole solution?*

*c) What does it mean "DC1 has the highest Fibre diameter mean meanwhile, DC3 has the shortest one. "?*

*d) Does student measure the fiber length? "For DC3, the mean fiber length decreases to 0.451  $\mu\text{m}$  with the lowest standard deviation of 0.143  $\mu\text{m}$ ".*

*e) What is the reason of increasing fiber diameter after adding of curcumin?*

*f) What is the role of fiber orientation on drug delivery?*

The submitted thesis **FULFILLS** requirements for the award of **Ing. degree**.

**I RECOMMEND** the thesis for defence and I evaluate it with the classification grade **EXCELLENT**.

**Name and surname of the opponent: doc. Fatma Yalcinkaya, Ph.D., MSc.**

**Date: 9.12.2024**

**Signature:**