

Łódź, 10 February 2026

Dr hab. Dorota Rybaczek, Prof. University of Lodz
Department of Cytophysiology
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Review of the doctoral dissertation

entitled "Post-Transcriptional Regulation of mRNA Mediated by Decapping and Degradation
Proteins in the Cytoplasm and Processing Bodies of *Larix Decidua*"

Doctoral student: Arash Matinahmadi, MSc (Nicolaus Copernicus University in Torun,
Department of Cellular and Molecular Biology)

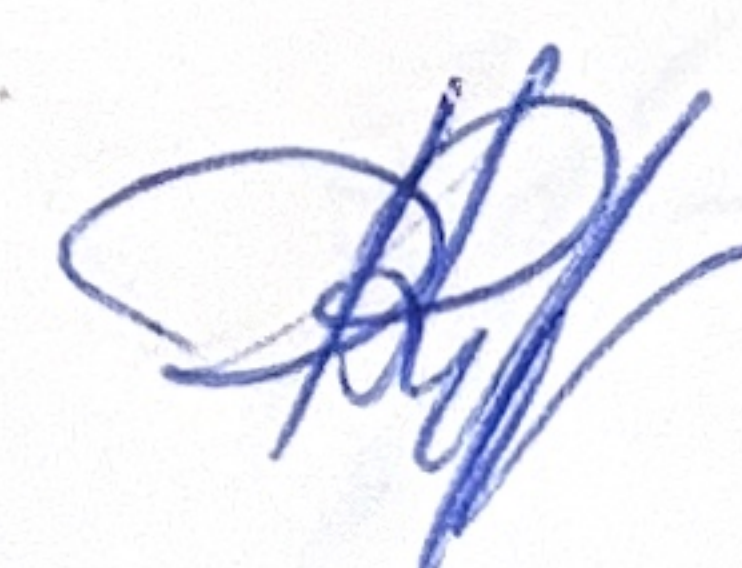
Main supervisor: Dr hab. Dariusz J. Smoliński, Prof. Nicolaus Copernicus University

Co-supervisor: Prof. Mehrdad Hashemi, Tehran Medical Sciences University

The formal basis for the review is Resolution No. 98 of the Scientific Council of Biological Sciences
at Nicolaus Copernicus University in Torun of 21 November 2025, pursuant to which I was
entrusted with the duties of a reviewer.

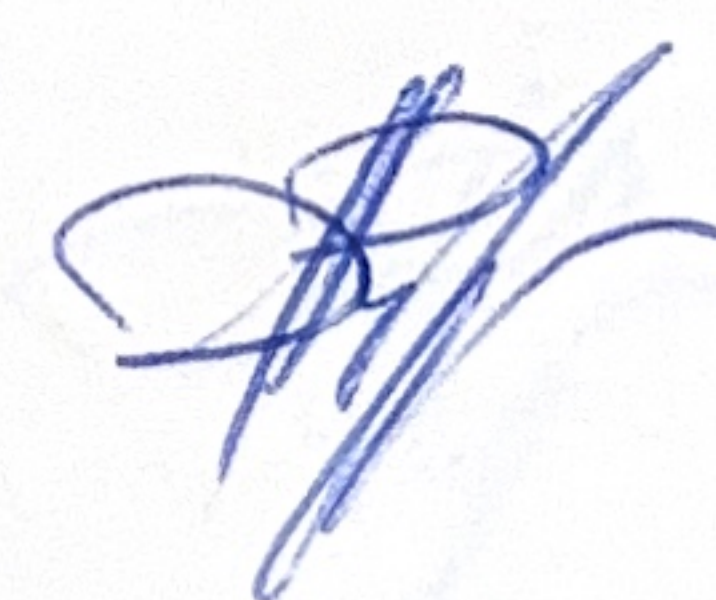
Overall formal assessment

The doctoral dissertation submitted for review is a work with a typical monograph layout written
in English. Not being an English language specialist, I assess the language of the manuscript
as good, with clear and lucid expression. The dissertation is 174 pages long and contains 36
illustrations and photographs (not including Supplementary). The **Introduction** provides
a sufficiently good introduction to the issues addressed in the experimental part of the
dissertation and logically leads to the presentation of the research objectives set by the doctoral
student. In my opinion, the font used in Figures 1_1 and 1_4 is far too small. The second chapter
(**Hypothesis and Objectives**) clearly presents the research objectives. Figure 2.1, which shows
changes in the level and intracellular location of poly(A) RNA, deserves recognition. I appreciate



the quality of this diagram and its role in facilitating the visualization of the processes described. The following chapter (**Materials and Methods**) describes the techniques used in the research in an extremely clear and precise manner. The **Results** are presented clearly and their critical **Discussion** in the light of the latest literature data is carried out in a manner that raises no objections. The doctoral student's broad knowledge and excellent theoretical preparation are also evidenced by the aptly selected bibliography (**Literature**). The graphic design of the manuscript is of a high standard. The figures and tables included in the introduction and discussion significantly facilitate the reader's understanding of the content, while those included in the '**Results**' chapter clearly illustrate the data obtained by the doctoral student. The dissertation is preceded by a table of contents, a summary in Polish and English, and a complete list of figures. A list of abbreviations is missing. The structure of the manuscript is clear, and the division into individual parts is correct and logical.

The main objective of the doctoral dissertation was to determine the role of proteins responsible for decapping (DCP5 and DCP2), degradation (XRN4) and regulating the level of RNA poly(A), as well as cofactors of this process (EDC4 and LSM4 proteins). European larch (*Larix decidua* Mill.) microsporocytes in the diplotene phase of prophase I of meiotic division were selected as the research model, as they constitute a natural research model for observing the individual stages of ribonucleoprotein metabolism under physiological and developmental conditions. It should be emphasised that I consider the subject of the doctoral thesis to be interesting and innovative. To solve the above research problems, the doctoral student used a diverse, modern and substantively justified research toolkit, significantly expanding the existing knowledge on mRNA degradation dependent on decapping and explaining when and where P bodies accumulate and how/where they act during the development of *Larix decidua*. The elegance with which the hypothesis was formulated and the research objectives were set, as well as the precision with which they were answered, deserve recognition. Mr Matinahmadi has mastered the craft of molecular biology, as evidenced by the conclusions in Chapter 6 (**Conclusions**) and the research ideas in Chapter 7 (**Perspectives**). I sincerely hope that the research ideas resulting from the implementation of the assumptions of this dissertation will allow the doctoral student to obtain his own research project and continue his work independently.



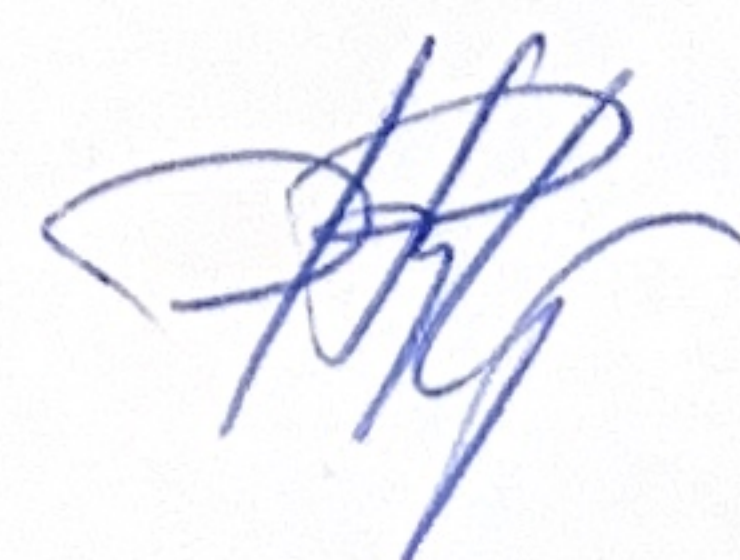
The role of the reviewer is also to point out any shortcomings in the thesis. The doctoral student has not avoided minor editorial errors. However, these minor errors do not affect the high substantive value of the dissertation. The weakest part of the doctoral dissertation is the bibliography and citations contained in Table 1_1. The nature of the irregularities may indicate the likely use of AI tools in compiling the list of citations, which was probably done without the necessary restrictive, time-consuming and responsible quality control. As a reviewer, I point out the following shortcomings: (i) editorial errors in bibliography items nos. 9, 11, 56, 57, 104, 165, 167, 190, 195, 198, 211; (ii) lack of page numbers and volumes in items: 30, 38, 47, 92, 138, 171; (iii) repetition of citations for the following items: 79-93-107; 105-106; 92-108; 141-143; 180-185; 216-217.

However, considering only the substantive aspects, I can say that after reading Arash Matinahmadi's doctoral dissertation, I am certain that the Author is a versatile scientist who carries out his research work with great commitment and passion.

In summary, I believe that the doctoral student has fully solved the original research problem he set himself. In addition, he has demonstrated his ability to work in a team, perfectly integrating his contribution into the continuation of research previously conducted at the Department of Cell Biology and assisting in the implementation of grant projects carried out at his home department.

While reading the doctoral dissertation, the following questions and suggestions came to mind:

- Already in the abstract of the thesis, it was stated that 'the time-space convergence indicates that decapping contributes to a late decrease in the level of poly(A) RNA in the diplotene of *L. decidua* microsporocytes...' - so my question is: how exactly was the time-space aspect studied? Was it mainly based on various types of microscopy? And, in the doctoral student's opinion, was this aspect of the research fully realized (given that experiments related to reaction kinetics and live-cell dynamics analyses are planned...)?
- Why was Hoechst used for DNA/chromatin staining instead of DAPI?
- Was the figure in subsection 3.3.5.4. created by the doctoral student?



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- The photographic documentation and data included in the graphs should be supplemented in each case with information on the number of cells counted in each sample. Please supplement this information during the public defence.

in summary, I conclude that the doctoral dissertation of Mr Arash Matinahmadi meets the requirements for doctoral dissertations, in accordance with the Act of 20 July 2018 on Higher Education and Science, as amended (Journal of Laws 2024, item 1571), and I request that the Council of Biological Sciences at Nicolaus Copernicus University in Torun admit the doctoral student to the next stages of the doctoral programme.

Considering the high substantive level of the reviewed dissertation, the quality of the research conducted, the multitude of research methods used, and the novelty of the results obtained, I request that the Council of Biological Sciences of the Nicolaus Copernicus University in Torun award the reviewed doctoral dissertation with an appropriate prize.



Lodz, 10 February 2026

Dr hab. Dorota Rybaczek, Prof. University of Lodz
Department of Cytophysiology
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Application for the award of a doctoral dissertation

entitled 'Post-Transcriptional Regulation of mRNA Mediated by Decapping and Degradation
Proteins in the Cytoplasm and Processing Bodies of *Larix Decidua*'
by Arash Matinahmadi, MSc

Considering the high substantive level of the reviewed dissertation, the quality of the research conducted, the multitude of research methods used, and the novelty of the results obtained, I request that the Council of Biological Sciences at Nicolaus Copernicus University in Torun award the reviewed doctoral dissertation with an appropriate prize.

