

Review of a PhD thesis

Topic: Titanium dioxide-based materials for isolation and purification of clinically significant RNAs

Author: Mgr. Denisa Smělá

Reviewer: doc. RNDr. Sabina Ševčíková, PhD

This PhD thesis aims to use titanium dioxide material for extraction and purification of different types of RNA molecules, including a subclass of non-coding RNA molecules (microRNAs) as well as viral RNAs. Both these topics are highly relevant.

This doctoral thesis is 158 pages long, very thorough and written in clear English. It contains a lot of tables and very nice figures, with relevant references.

The introduction contains a comprehensive review of various RNA molecules and basically all the methods that can be used for their isolation. I especially enjoyed the description of history of RNA research as I think it is relevant to be aware of all the major advances in the field of study. The aims are clear and well formulated. From the description of the methods, it is obvious that the student learned and utilized many modern and relevant techniques. The student tested several titanium dioxide materials for RNA isolation. The description of results and discussion are very well written and clear.

The student is a first-author of two publications, one in International Journal of Molecular Sciences (IF= 6.208) and second in Molecules (IF= 4.927). Moreover, two other publications are submitted. The student also attended several conferences where she presented her work.

Masarykova univerzita, Lékařská fakulta

Kamenice 753/5, 625 00 Brno, Česká republika

T: +420 549 49 2910, E: info@med.muni.cz, www.med.muni.cz

Bankovní spojení: KB Brno-město, ČÚ: 85636621/0100, IČ: 00216224, DIČ: CZ00216224

Questions:

1. Can you explain the difference between a microRNA cluster and family?
2. Are genes for microRNAs found on all human chromosomes?
3. In your opinion, could you use the titanium dioxide materials for DNA isolation?
4. How much RNA are you able to isolate?

Conclusion:

This PhD thesis offers new and relevant research in the field. As the student showed her creative abilities, I am recommending this thesis for defense.

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Doc. RNDr. Sabina Sevcikova, PhD

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