# NBM-23-0200.R1 - Decision on Manuscript

1 message

**NMR in Biomedicine** <onbehalfof@manuscriptcentral.com> Fri, Feb 2, 2024 at 9:40 AM
Reply-To: cristina.cudalbu@epfl.ch
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02-Feb-2024

Dear Dr. LaMaster,

Manuscript # NBM-23-0200.R1 entitled "MRS-Sim: Open-Source Framework for Simulating In Vivo-like Magnetic Resonance Spectra" which you submitted to NMR in Biomedicine, has been reviewed. The comments of the reviewers are included at the bottom of this letter. One reviewer accepted the manuscript while the second one recommended major revisions to your manuscript. Therefore, I invite you to respond to the reviewers' comments and revise your manuscript.

To submit your revised manuscript: Log in by clicking on the link below https://wiley.atyponrex.com/submissionBoard/1/f69b399c-bb3f-437c-b578-53c138c990e7/current

Or

Log into submission.wiley.com/journal/NBM. Sort by journal and submission status to locate this manuscript, then click the “Revise submission” button to submit your revision.

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We provide authors with a reasonable length of time to submit their revised manuscript. Your revision is due on 31-Jul-2024 . If you require more time you must contact the Editorial Office to be granted an extension, otherwise the option to revise will expire. Please note that resubmitting your manuscript does not guarantee acceptance.

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Once again, thank you for submitting your manuscript to NMR in Biomedicine.

I look forward to receiving your revision.

Sincerely, Dr. Cristina Cudalbu
Editor, NMR in Biomedicine
cristina.cudalbu@epfl.ch

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PLEASE NOTE: The reviewer may have returned their comments to me as a separate file. We do not attach these files to the decision letter as they can interfere with successful delivery of emails. You can view the reviewer's attachment by by logging into the submission site at submission.wiley.com/journal/nbm

Comments to Author:

Reviewer: 1

Comments to the Author
Rebuttal 'MRS-Sim: Open-Source Framework for Simulating In Vivolike
Magnetic Resonance Spectra'

The authors have carefully addressed all the points I raised in my review, showing a clear grasp of the feedback. Their revisions demonstrate a careful and detailed approach, successfully integrating suggestions to improve the overall quality and clarity of the manuscript. I'm happy to note that the authors' responses have met my expectations, leading to a substantially improved and more solid scientific contribution.
I only have three minor feedback points for the summary. When these points are corrected, I fully agree with the publication.

1) Summary:
Thank you for addressing the previous review points. The summary reads much better now. I have three minor points still:
a) 'When simulating clinical-like datasets, it is important to be able to study the underlying ranges and statistical distributions of the simulation parameters of the clinical data. Therefore, accompanying software can analyze the distributions and ranges of parameters in fitted datasets, allowing simulations to be tailored to specific clinical data.' - these two sentences say the same in different words, but are still not clear to me. Why is it important to analyze underlying distributions? And which software can do this?
b) Line 40: 'The availability of readily available..' - word repetition
c) The last sentence is redundant.

Reviewer: 2

Comments to the Author
Thank you for the chance to review this revised manuscript. The authors have addressed many of the comments from the first review but further clarity is needed. Specific comments are below:

Abstract/summary:
- The end of the first paragraph states 'raw multi-coil transients.' This could be more precise, ie, do the authors mean "raw data from multi-channel phased arrays"?

- Overall, while the abstract has been revised, it still reads more theoretical in nature rather than summarizing the tool itself (particularly the end of the summary). For example, in the second paragraph, it states 'When simulating clinical-like datasets, it is important to be able to study the underlying ranges and statistical distributions of the simulation parameters of the clinical data. Therefore, accompanying software can analyze the distributions and ranges of parameters in fitted datasets, allowing simulations to be tailored to specific clinical data." By "accompanying software, does this refer to MRS-Sim? Same for the last paragraph – is the 'framework' MRS-Sim? It would help to be more explicit in the abstract.

Introduction:
- Manuscript p2, line 33 – 'In this work, "in vivo spectra" refers to the data that comes off a clinical scanner before post-processing and analysis begins." Is this what the authors mean? Or do they mean, data that comes off a human/whole-body MRI scanner (clinical or research-dedicated) and is acquired in vivo from a living human or other mammal? It's not entirely clear if this new definition is 1) necessary based on the next sentence (ie, to reframe the

task of simulating data, etc), and 2) different than what is simulated with other processing tools, eg, FID-A. Clarification seems necessary here.
- Last paragraph – is the work presenting a new model for generation or just a tool to do so? In this paragraph, MRS-Sim (presumably) is referred to throughout as a 'synthetic data generation model', a 'software', and a 'framework'. It would help for the authors to refer to their simulator as 'MRS-Sim' throughout, as it doesn't seem like the model itself is entirely new (just repackaged).

Methods:
- First paragraph of 2.1 – this paragraph changes tense and it's unclear what is being done in this work and what is theoretical. It is, in places, difficult to identify what is being presented in this current manuscript, and what has either been done or is instead commentary on what was done here.
- For many sections, eg, 2.1.4, 2.1.5, the 'supplement' is referred to. It would help if this were more formally referenced, ie, "Section # of the Supporting Information." (NMR Biomed refers to this material as 'Supporting Information').
- 2.1.7, Phase Offsets – a bit of detail on how these are modeled would help. It seems this is more of a definition of what zero and first order phase is, rather than how it is implemented in the model or what options are available in the simulator.
- 2.1.10, Multi-coil transients – see Summary but this term can be clarified. It's unclear if the authors are referring to repeated excitations/averages, or combined data from multi-channel phased arrays.
- In the 'coil sensitivity' sub-section at the end of this section, it would help if the methods available for coil combination are described. Right now, it reads 'A variety of coil combination techniques can be used…" but this isn't Methods perse. What is the default and what methods are available in the simulator?
- Section 2.4. After the first sentence of the second paragraph, missing a space before the next sentence.
- Section 2.4.1 – ensure all abbreviations are defined in the text on first use. This section also refers to Figure 8 and 9, but these seem to be Results and likely should not be discussed until the Results section (or need to be included in the manuscript in the Methods section).

Results and Discussion: An opening section summarizing the MRS-Sim would be helpful for this section, followed by the rest as this section is still very sparse. It's unclear why the authors only highlight the baseline and residual water generator, followed by the complete Model. Is this the key unique part of the simulator (it seemed also that B0 maps simulations were a new feature compared to existing tools)?

Conclusions: Much of this reads as discussion versus conclusions (particularly paragraphs 3-4 which could be moved to Results and Discussion as these should come earlier).

Acknowledgments: These should be limited to acknowledgments to the work described rather than general acknowledgments by the authors (ie, what specific scientific contributions did these individuals make towards this manuscript?)

Supplement, B0 simulator - some of this language is still very colloquial, ie, '"Now that the model volume has been defined, it is time to model the actual B0 field." Much of the supporting information reads as hypothetical, ie, that something can be done but not necessarily that it was done or how it was done.