

Dear Editor,

We appreciate the valuable and suggestive comments from you and the reviewers on our manuscript entitled “Research on nanosciences involvement in pharmaceutical education should be reinforced” (WJEM-87143). We have addressed all the comments raised by the reviewers and carefully revised the manuscript based on your suggestions. The amendments are highlighted in yellow in the revised manuscript, and point-by-point responses to the reviewers’ comments are attached below. We hope that the revised manuscript is now acceptable for publication in World Journal of Experimental Medicine. Look forward to hearing from you at your earliest convenience.

Yours sincerely,

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Reviewer 1

Q1. Are there controversies in this field? What are the most recent and important achievements in the field? In my opinion, answers to these questions should be emphasized. Perhaps, in some cases, novelty of the recent achievements should be highlighted by indicating the year of publication in the text of the manuscript.

A1. Thank you for your valuable comments.

(1) About controversies in this field, literature published in 2022~2023 were referenced. A new section on ethical and environmental toxicity controversies of nanoscience was added. (Page3 Line 50- Page 3 Line 52):

Although nanotoxicology is a rising concern worldwide, and the ethical issues (so-called “nanoethics”) and the ecological risk of nanotechnology have been identified, the application of nanomaterials and nanotechnologies is still shed light on.

(2) About the most recent and important achievements in the field, literature published in 2016~2023 were referenced. Recent specific products in nanoscience in the fields of chemistry, environment, biology, medicine, and pharmaceutical sciences are added. (Page 3 Line 55- Page 4 Line 57):

In the chemistry field, it is possible to apply nanotechnologies to various chemical compounds, including polymers, to modify their structure and function. In a recent study, metal-organic framework (MOF)--based nano-adsorbents have made a number of noteworthy advances in antichemical warfare reagents. In the biology field, one of the most acclaimed achievements in nanotechnology in molecular biology is

claiming the vaccination mechanism for COVID-19 using nanoscale vector systems. In the environment field, nanotechnology is utilized not only to enhance the environment but also to produce renewable sources of energy. A paradigmatic example is the employment of nanofluids in solar cells can produce electricity at a competitive cost. In the medical field, the successful applications of nanomedicine help to develop enhanced versions of diagnostics, treatment, prevention, and proactive healthcare measures. Recent research has shown that the controllability of nanorobots has been advanced, allowing for efficient remodeling of dense tumor stromal microenvironments to enable deep tumor penetration.

Q2. The results and discussion section is very weak and no emphasis is given on the discussion of the results like why certain effects are coming into existence and what could be the possible reason behind them.

A2. Thank you for your valuable comments. According to the suggestions, the results and discussion section were strengthened.

(1) A section discussing why nanoscience is less frequently covered in pharmacy education was added. (Page 5 Line 87-95):

The reasons may be as follows. Nanotechnology is a cutting-edge research field; its novelty may present some challenges to the faculty. Even in a nanoscience or nanotechnology training program, some teachers show a preference for teaching more familiar courses so that they can apply the knowledge into the classroom timely. It is documented that low self-confidence, associated with a lack of knowledge about the

new content, sometimes hinders the acceptance and the willingness to use it in the classroom. Another aspect is that the study of basic theoretical subjects is still generally considered necessary in pharmacy education. Some people therefore reject the educational importance of nanoscience, believing that there is no room for a new science curriculum like that.

(2) The discussion section on why there is a scarcity of documents on the intersection of nanoscience and pharmacy education was added. (Page 6 Line 106-112):

In authors' perspective, characterized by interdisciplinarity, nanoscience is a deeply interconnected discipline, encompassing diverse areas of modern science and technology. When taking nanoscience into the classroom, it has been confronted with the dilemma of whether it should be taught as a new or a subsidiary discipline. Accordingly, the intricate nature of nanoscience may be the possible reason that has resulted in a scarcity of research exploring its intersection with a specialized field such as pharmacy education.

(3) A section for discussing why the inclusion of nanoscience in pharmaceutical science will become more comprehensive in the future was added (Page7 Line 123-134):

It is worth noting that the market for nanomedicines for disease management has great potential. The global market for nanomedicine was estimated at \$53 billion in 2009. It is expected to grow by 13.5% to reach \$100 billion in recent years. These data demonstrate global interest in the nanoscience field. Therapeutic formulations

utilizing nanotechnology hold potential for improving clinical outcome. Engineered nanomaterials are rapidly evolving in drug development, and offer promise in overcoming biological barriers and achieving precise drug delivery for precision medicine. In addition, the potential of nanotechnology in pharmacy will be further expanded with efforts to combine nanomaterials with some established formulations. Recent studies have pointed out that the combined properties of hydrogels and nanoparticles in smart nanogels can improve drug loading capacity, drug stability, target delivery, and therapeutic efficacy. Considering these factors, it is foreseeable that nanotechnology will become more widely and tightly integrated into pharmaceuticals in the future.

Q3. Conclusion: not properly written.

A3. (1) We were sorry that the original last paragraph was actually not the conclusion, which was misleading.

(2) A new concluding paragraph was added. (Page 9 Line 165-177):

In summary, nanoscience is rapidly evolving in a number of disciplines and fields. It has been widely used in the fields of chemistry, biology, environment, medicine, and pharmacy, and has attracted much attention. Especially in the field of pharmacy, nanoscience and nanotechnology have played a significant role. However, at present, pharmaceutical courses and educational studies are lacking in the coverage of nanoscience, which is detrimental to the cultivation of talents in this field. The gaps in this area should be further addressed by all groups. The authors herein put forward

three suggestions to boost the inclusion of nanoscience in pharmacy education, viz. (1) colleges and universities should establish scientific foundations for the educational reformation of nanoscience courses, (2) faculties must initiate changes to their curricular systems and add nanoscience courses and (3) Journals should encourage the submission of relevant studies as a publishing platform. Similar to the situation of pharmacy education, clinical medicine training should also include more courses on nanotechnology, and we will be conducting in-depth research on this topic in the future.

Q4. Results and conclusion: The section devoted to the explanation of the results suffers from the same problems revealed so far. Your storyline in the results section (and conclusion) is hard to follow. Moreover, the conclusions reached are really far from what one can infer from the empirical results.

A4. Thank you for your valuable comments.

(1) We are sorry that this paper was not submitted as a common experimental article, and the section on results and discussion will seem to be unfamiliar to readers of experimental articles. However, as a Letter to the Editor, we believe that the concise writing of results and discussions is acceptable for this type of paper. We hope for your comprehension.

(2) Following your suggestion to make the storyline clearer, “However, only eight documents were retrieved, which was surprisingly low.” was changed to “According to the results of literature survey, however, only eight documents were retrieved,

which was surprisingly low.” (Page 7 Line 132), to indicate it was a discussion content.

(3) The last paragraph of the original version was not a proper conclusion, as pointed out by the reviewer; therefore, we have included a new concluding paragraph (Page 9 Line 165-177):

In summary, nanoscience is rapidly evolving in a number of disciplines and fields. It has been widely used in the fields of chemistry, biology, environment, medicine, and pharmacy, and has attracted much attention. Especially in the field of pharmacy, nanoscience and nanotechnology have played a significant role. However, at present, pharmaceutical courses and educational studies are lacking in the coverage of nanoscience, which is detrimental to the cultivation of talents in this field. The gaps in this area should be further addressed by all groups. The authors herein put forward three suggestions to boost the inclusion of nanoscience in pharmacy education, viz. (1) colleges and universities should establish scientific foundations for the educational reformation of nanoscience courses, (2) faculties must initiate changes to their curricular systems and add nanoscience courses and (3) Journals should encourage the submission of relevant studies as a publishing platform. Similar to the situation of pharmacy education, clinical medicine training should also include more courses on nanotechnology, and we will be conducting in-depth research on this topic in the future.

Q5. The discussion should be rather organized around arguments avoiding simply

describing details without providing much meaning. A real discussion should also link the findings of the study to theory and/or literature.

A5. (1) The section "To achieve this aim, the author proposes three suggestions" (Page 7 Line 137) may better fits the definition of "discussion". We are sorry that the original version did lack specifics and links to literature.

(2) We have reframed the original discussion and added lots of information so that it provides meaning and links to the literature. (Page 7 Line 138-Page 8 Line 147):

Firstly, colleges and universities should establish scientific foundations for the educational reformation of nanoscience courses; The role of foundations in support of the education process is indispensable. A positive example to be studied is the National Science Foundation (NSF). The NSF is charged with funding basic research programs to maximize the advancement of science in the United States through the development of scientific information. In the National Nanotechnology Initiative (NNI), NSF assumed responsibility for funding basic research and education in nanoscience and nanotechnology, leading to a healthy growth of nanotechnology in the US. Referring to the operation and supporting model of NSF, sufficient attention from colleges and universities should be given to the investment of adequate funding to meet the development of nanoscience in pharmacy education.

Secondly, faculties must initiate changes to their curricular systems and add nanoscience courses. In the post-pandemic era, the rate of change in healthcare has rapidly accelerated. Consequently, healthcare professionals must dedicate themselves to lifelong learning through continuing education and professional development

programs, including those associated with nanoscience. For instance, teachers should learn about the applications of nanotechnology in COVID-19 treatment, and pass the knowledge to the students in the classroom. Through these efforts, students can gain scientific and technological literacy, which has a significant impact on curriculum design. It can also serve as an effective means of bridging the gap between workforce needs and cutting-edge fields.

Lastly, Journals, such as the World Journal of Experimental Medicine, should encourage the submission of relevant studies as a publishing platform. Currently, the evaluation of papers by impact factor is still the dominant approach used by journals. However, this single-factor approach has led to much discussion about its update or revolution, and the actual implication of papers for the real world should be reconsidered. As a publishing platform, considering and encouraging papers based on multiple factors may be a positive guide for the conduct of research focusing on a rare field (the very scenario of nanoscience education in pharmacy).

Q6. Spacing, punctuation marks, grammar, and spelling errors should be reviewed thoroughly. I found so many typos throughout the manuscript.

A6. We were quite sorry for the issues in language and invited a native English speaker to correct and polish the language. Some changes were listed below as examples:

1. Page 2 Line 40, “involved” was changed to “included”;
2. Page 2 Line 43, “a few” was changed to “few”;

3. Page 2 Line 45, “perform” was changed to “conduct”;
4. Page 3 Line 54, “regions” was changed to “fields”;
5. Page 6 Line 114, the title of Table 1, “searching” was changed to “search”;
6. Page 9 Line 137, “proposed” was changed to “proposes”.

Q7. English is modest. Therefore, the authors need to improve their writing style. In addition, the whole manuscript needs to be checked by native English speakers.

A7. As responded in Q6, the writing had been checked by a native English speaker from Enago, a professional English editing servicer. The language editing certificate was uploaded into the system.

Reviewer 2

Q1. According to me, the question of nanotechnology application in pharmaceutical preparates is very important not only in context of modern drug technology but also in context of undesirable contaminations of drugs (e.g. vaccines), which can cause serious adverse effect, dangerous for healthy and life. For this reason, I found the knowledge concerning nanoscience and nanotechnology to be important for all medical practitioners, not only for pharmacists. Although, contemporary, the nanoscience is rather widespread, however, it is not sufficiently known among clinicians.

A1. (1) Thank you very much for your reviewing work. We appreciated the reviewers' deep understanding of nanotechnology's inclusion in drug science.

(2) We agreed with the reviewer that nanoscience was not sufficiently known among clinicians, and thus added some relevant comments in the Concluding remarks (Page 9 Line 175-176):

Similar to the situation of pharmacy education, clinical medicine training should also include more courses on nanotechnology, and we will be conducting in-depth research on this topic in the future.

Reviewer 3

Q1. The manuscript is accepted.

A1. Thank you so much for your great reviewing work.

Editor

Q1. I have reviewed the Peer-Review Report, full text of the manuscript, and the relevant ethics documents, all of which have met the basic publishing requirements of the World Journal of Experimental Medicine, and the manuscript is conditionally accepted.

A1. Thank you very much for your great reviewing and editing work.

Q2. I have sent the manuscript to the author(s) for its revision according to the Peer-Review Report, Editorial Office's comments and the Criteria for Manuscript Revision by Authors. Please provide the original figure documents.

A2. We provide the original figure documents in the current version.

Q3. Please prepare and arrange the figures using PowerPoint to ensure that all graphs or arrows or text portions can be reprocessed by the editor. In order to respect and protect the author's intellectual property rights and prevent others from misappropriating figures without the author's authorization or abusing figures without indicating the source, we will indicate the author's copyright for figures originally generated by the author, and if the author has used a figure published elsewhere or that is copyrighted, the author needs to be authorized by the previous publisher or the copyright holder and/or indicate the reference source and copyrights. Please check and confirm whether the figures are original (i.e. generated de novo by the author(s))

for this paper). If the picture is 'original', the author needs to add the following copyright information to the bottom right-hand side of the picture in PowerPoint (PPT): Copyright ©The Author(s) 2023.

A3. As the figures were 'original', the information 'Copyright ©The Author(s) 2023' was added to them in PPT. Please refer to our updated files.

Q4. Authors are required to provide standard three-line tables, that is, only the top line, bottom line, and column line are displayed, while other table lines are hidden. The contents of each cell in the table should conform to the editing specifications, and the lines of each row or column of the table should be aligned. Do not use carriage returns or spaces to replace lines or vertical lines and do not segment cell content.

A4. Standard three-line table was provided in the current version. Please refer to our updated files.