Peer Review File

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Reviewer A

This manuscript reviewed the recent cTn biosensors. It discussed different types of biosensors and compared their detection range and sensitivities. It also briefly mentioned the future development directions for the bedside rapid detection of cTn. The following concerns need to be addressed:

1. The literature mentioned in this paper is about cardiac troponin I(cTnI). The author should specify it in the title, abstract, table's caption, and conclusion.

We sincerely appreciate your many constructive comments on our article. These comments are very professional and valuable and help to improve our articles. Based on your comments, we have extensively revised the manuscript and made appropriate additions to some sections. All modifications have been marked in red.

Reply 1: We have made it clear in the title, abstract, table's caption, and conclusion, as recommended, that the detection object of this article is "Cardiac Troponin I".[see Page1 Line3/6 (Title); Page2 Line36/42/48/51/54-55/58/61 (Abstract); Page3 Line87 (Introduction); Page3 Line97; Page4 Line101(Methods); Page4 Line104; Page5 Line152; Page11 Line346; Page14 Line445; Page15 Line459 (Conclusion); Page21 Line625 (Table 2's caption); Page21 Line630 (Table 3's caption)].

2.What samples were used for the performance parameters summarized in Table 2 and Table 3? Did they all use simple sample matrices like PBS or buffer or serum and plasma? The author should confirm if the values from different strategies are from the same sample type. Values obtained from different sample complexities are not suitable for direct comparison.

Reply 2:The samples used in the performance parameters summarized in Table 2 and Table 3 are the standard samples of cTn I, which are diluted with simple sample matrices such as 1×PBS buffer to different concentrations for detection.

3. Table 2 and table 3 should add columns to specify the biosensor design and the reference paper, because different biosensor designs of one type of sensor have very different detection performance.

Reply 3: We have added two columns to each of the 2 tables to describe the materials used for each biosensor example and the corresponding references, as suggested.[see Page 21, line 625 (Table 2); Page 21, line 630(Table 3)].

4. The authors reviewed voltammetric, potentiometric, electrochemical impedance spectroscopy, electrochemical luminescence, and FET signal sensors. Two of the discussed types were missing in line 128, page 4. They should be added in line 128, page 4.

Reply 4: We have added "potentiometric, electrochemical impedance spectrometry," to the sentence under discussion, as advised.(see Page 5, line 164).

5. The authors mentioned, "This paper...summarizing the advantages and disadvantages of biosensors based on electrochemical, colorimetric, fluorescent, chemiluminescent, and SERS techniques.". However, disadvantages were only discussed in the Electrochemical biosensors section, and they were missing in the other types of biosensors.

Reply 5: We have replaced "advantages and disadvantages" with "characteristics" (see Page11, line345; Page 14, line446) and made some additions to the fluorescence(see Page 9, line 274-278), SERS(see Page 11, line 328-333) and SPR(see Page 11, line 336-339) type sensors, respectively.

6. In the sections discussing different types of biosensors, many biosensors used nanomaterials. As a result, the current placement of the "Integration of Nanomaterials and Biosensors" section seems to disrupt the paper's overall structure. To enhance the coherence of the paper, the authors should remove the "Integration of nanomaterials and biosensors" section and add its content to the previous sections.

Reply 6: We have removed the "Integration of nanomaterials and biosensors" section as suggested and added its content to the general introduction of the previous "Types of biosensors for detecting cardiac troponin I" section.(see Page 4, line 116-154).

7. Page 11 line 335 should be changed to "Some recent bedside cTnI testings include gate-controlled FET biosensors, ..." to avoid confusion.

Reply 7: We have replaced "These" with "Some recent bedside cTnI testings" as advised.(see Page 12, line 391).

8. The author mentioned, "In the future, POCT should be developed to be highly integrated, miniaturized, cost-effective, and easy-to-operate detection systems."(Page 12 line 367). The authors should briefly discuss the current level of integration, miniaturization, cost, and operational simplicity of the three POCT devices.

Reply 8: As suggested, we have discussed the three POCT devices in the corresponding section, comparing their testing time, volume and cost.(see Page 14, line426-428). And, to make it more obvious, we have added relevant information about two of the sensors.(see Page 13, line398-400; Page 13, line421-424).
Thank you again for your comments and suggestions. We hope that you will be satisfied with this revised version.

Reviewer B

The manuscript titled "Methods for detecting of cardiac troponin biomarkers for myocardial infarction using biosensors: a narrative review of recent research" has updated information about cardiac troponin biomarkers. Although it can include more information in detail in some figures, it is useful for scientists. In consequence, it is proper to publish for scientists to know more about the advances of biomarkers in this field.

Reply: We appreciate your professional comments on the article. Your comments are very helpful in improving the quality of our article. We have added extra parameters to some of the examples.[see Page 21, line 625 (Table 2); Page 21, line 630(Table 3)]. All modified parts are marked in red. Thank you again for your positive comments and valuable suggestions.

Reviewer C

This study reviewed the progress of cardiac troponin detection based on biosensing strategies. The authors found that cardiac troponin detection methods based on biosensing strategies have their own advantages and disadvantages in clinical applications, and their sensitivity has been constantly improved. In the future, the detection of cardiac troponin using biosensing technology will be simpler, faster, more sensitive, and portable. The paper is interesting but its presentation should be improved and it should be expanded with other scientific directions and technologies related to this field.
The authors should enrich the paper with graphical materials and real examples.
As for the technologies, the authors should pay attention to the lab-on-chip, microfluidic-based platforms, etc.
For example:
https://www.mdpi.com/2072-666X/12/6/691
https://www.mdpi.com/2072-666X/13/1/20

Reply: We sincerely appreciate your valuable comments. We agree that more graphical materials and real examples would be useful to understand the details of various types of biosensor designs. Due to conditions, we did not obtain further permission to use the images from the authors of the examples. For the sensors listed, most examples use the standard addition method. Some examples that use voluntary donor serum samples have been added by us.(see Page6, Line173-176/186-188; Page8, Line233-235; Page13, Line411-413). Moreover, We have carefully read the literatures related to microfluidic platforms that you suggested, and have briefly discussed microfluidic technology and added some references in the "Clinical translation" section of the revised manuscript.(see Page14, Line428-435/439-441). Some changes have been made in the revised paper which are marked in red. I hope the revision will be approved. Thank you again for your comments and suggestions.