Review of: "[Review Article] Nanocarriers for Protein and Peptide Drug Delivery"

Pouria Gharehbeglou[1]

1 Tabriz University of Medical Sciences

Potential competing interests: No potential competing interests to declare.

Dear authors,

I consider your research to be of significant value and innovation, presented in a well-structured and eloquently written manner. Nevertheless, certain aspects require attention and reconsideration for publication, as outlined in the reviewer report I have provided.

……..

Section by section comments:

Abstract:

- Given that this is a review article, the subtitle "Materials and Methods" may not be entirely suitable as there isn't a distinct materials and methods section

General comment:

The abstract of the article is enlightening and provides a clear summary of the study.

……

Introduction

The introduction provides a comprehensive overview of the significance of peptides and proteins in biomolecular applications, with a particular focus on their challenges and potential solutions through nanotechnology. Here are some points for consideration:

- Kindly elaborate on the limitations encountered by proteins and peptides, encompassing factors like their brief half-life and swift breakdown, in order to offer readers a more nuanced and detailed comprehension.
- Please be mindful of repetitive phrases, such as "considerable potential" and "considerable benefits." Exploring synonyms or rephrasing for variety could enhance the text.
- Please replace the colon after "following" with a parenthesis to enhance readability.
- Please clarify the enumeration of points by adding Roman numerals (I, ii, iii, iv) for each application of nanoparticle technology in protein delivery.

.....

Microsphere

- The text emphasizes the importance of selecting an appropriate polymer for microsphere formulation, but it would be valuable to delve into specific examples or criteria for selection. Providing more details on the properties that make a polymer suitable for controlled drug release would further enhance the scientific depth of the discussion.
- The text briefly mentions the low oral bioavailability of the medication but lacks elaboration on the factors contributing to poor absorption or potential strategies to enhance oral delivery. Incorporating information on the challenges associated with oral delivery and proposing possible solutions would significantly enhance the scientific value of the discussion.
- The text mentions the utilization of both natural and synthetic polymers without delving into the specific criteria guiding the choice between the two. A scientific exploration of the advantages and disadvantages associated with natural versus synthetic polymers in microsphere formulations would be highly beneficial.
- While polyester is mentioned as the most commonly employed polymer, the text lacks information on why polyester is preferred, its specific characteristics, and how it compares to other polymers in terms of drug release and stability. Including this information would enhance the scientific rigor of the discussion.

.....

Microemulsion

- The text notes that the microemulsion composition consists of particles measuring 0.15 µm. It would be beneficial to elaborate on the significance of this specific particle size, particularly in the context of drug delivery, with a focus on insulin encapsulation.

.....

Nanoemulsion

- Given the variation in nanoemulsion sizes reported in different articles, it is recommended to include references or a specific citation for this section.: Nanoemulsion is a thermodynamically stable, isotropic, transparent or translucent particle with a particle size of 1 to 100 nm formed spontaneously from water, oil, surfactants, and co-surfactants.
- I would like to suggest that the section discussing the discovery of the dispersion system by Hoar and Schulman in 1943 and Schulman's proposal of the term "Nanoemulsion" in 1959 could potentially be omitted, in my opinion, to streamline the content and focus on more pertinent aspects.
- I appreciate the current order of subjects, but there is a suggestion to ensure a harmonious arrangement across all sections for better cohesion.
- The sentence "Nanoemulsion has many advantages that are unparalleled by other preparations:" could be rephrased for better flow. For example: "Nanoemulsion offers numerous advantages that are unparalleled by other preparations,

including:"

- The sentence "Nanoemulsions are essential in the preparation of oral and topical dosage forms that enable optimum transport of proteins and peptides" contains redundancy. Please consider rephrasing for conciseness, such as "Nanoemulsions play a crucial role in preparing oral and topical dosage forms, facilitating optimal transport of proteins and peptides."

.....

Nanoparticles

- The text introduces MSNs briefly but does not delve into their specific advantages for protein delivery. Providing more details on why MSNs have attracted interest, along with specific examples or applications, would enhance the scientific understanding.

.....

Liposomes

- While the method acknowledges researchers employing various strategies, it could benefit from additional specificity. Elaborating on the particular strategies being utilized would contribute to a more comprehensive and informative description.
- Kindly consider ensuring consistency in verb tenses. For instance, the use of "have proven" and "are employing" implies ongoing actions, while the past tense is utilized later in the paragraph. It would be beneficial to maintain uniformity for a smoother flow of the text.

.....

Protein-based nanoparticles

- The phrase "wherein drugs are either linked to proteins as carriers or the active therapeutic agents themselves are recombinant proteins" could be enhanced for improved clarity through parallel structure. For example: "wherein drugs are either linked to proteins as carriers or are recombinant proteins serving as active therapeutic agents."
- The quality of the figure is quite low. Please replace it with a higher quality figure, and the title of the figure is: Fig 1.

.....

Solid Lipid based Nanoparticles

- The paragraph introduces solid lipid nanoparticles as an alternative to liposomes and emulsions but lacks specific information on the drawbacks they aim to overcome. Including a brief mention of the drawbacks associated with liposomal drug administration would enhance the context and provide a more comprehensive understanding.
- The statement "These nanoparticles have proven to be efficient in drug delivery" lacks specificity. Including specific examples or referencing studies that demonstrate the efficiency of solid lipid nanoparticles would add scientific support

and strengthen the statement.

- The paragraph begins in the past tense ("were introduced in 1990") and later switches to the present tense ("have proven," "are made of," "stay solid"). To maintain consistency in verb tenses, consider revising the latter part to match the past tense. For example: "were introduced in 1990 and have proven to be effective. They were made of...".

……

Mucoadhesive Polymeric Systems

- The mention of newer polymers like cationic chitosan and anionic alginate is insightful, but additional information on their specific advantages or applications in mucoadhesive systems would be beneficial. Providing more details could enhance the understanding of their roles and benefits in these systems.

……

Conclusion and Future Trends

- The suggested future research directions are well-stated, but offering more specifics on the optimization of nanocarrier design or detailing innovative strategies for overcoming biological barriers could enhance the guidance for future research.
- Terms like "considerable hurdles" and "vast size" could be replaced with more specific language for a more precise description.