



Peer-Review Record:

Nanocarriers for Delivery of Antioxidants on the Skin

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Reviewer 1: Anonymous

Reviewer 2: Anonymous

Editor: Martina Meinke (Guest Editor of Special Issue “The Antioxidant Potential of the Skin”)

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First Round of Evaluation

Round 1: Reviewer 1 Report and Author Response

1. The manuscript entitled “Nanocarriers for delivery of antioxidants on the skin” is an interesting review based on the problem of an efficient drug delivery into the skin. The development of oxidative stress and its counteracting is a very important problem which should be improved. This review article gives the reader a very good overview of the different nanocarrier systems and their properties. The article is well written and presented. In general, this thematic is very interesting and actual. I recommend publication.

A few questions/ hints have arisen:

1) In general: Please write “in vivo” in italics.

Response: all in vivo and also in vitro has been written in italics.

2) In the abstract and also in the introduction only UV radiation is mentioned. Please keep in mind that several publications have quite nicely shown that also VIS/ NIR induce the development of free radicals in skin (oxidative stress). Please add a few sentences.

(1) Radical protection by differently composed creams in the UV/VIS and IR spectral ranges. Meinke, M.C.; Syring, F.; Schanzer, S.; Haag, S.F.; Graf, R.; Loch, M.; Gersonde, I.; Groth, N.; Pflücker, F.; Lademann, J. *Photochem. Photobiol.* 2013 Sep-Oct; 89(5):1079-84. doi:10.1111/php.12137.

(2) Radical protection in the visible and infrared by a hyperforin-rich cream—*in vivo* versus *ex vivo* methods. Arndt, S.; Haag, S.F.; Kleemann, A.; Lademann, J.; Meinke, M.C. *Exp. Dermatol.* 2013 May; 22(5):354-7. doi:10.1111/exd.12124.

Response: the articles have been included.

2. Please define NP (page 2, line 39ff.).

Response: NP has been defined.

3. In the introduction you write that ROS are reduced by among other by endogenous and exogenous small molecules. Please write some more sentences to this molecules.

Response: it has been included.

4. Please replace antioxidant capacity (p.2, line 67) to antioxidant status.

Response: it has been replaces.

5. Please correct: Page 4, line 117 c) to b) and alter the followed terms...

Response: it has been corrected.

6. Please define EPR (page 5, line 142)

Response: the correct definition has been included.

7. Several nanocarriers for coenzyme Q10 delivery were examined. Please add the following publication (page 7, line 220 plus in Table 1):

Ultra-small lipid nanoparticles promote the penetration of coenzyme Q10 in skin cells and counteract oxidative stress. Lohan, S.B.; Bauersachs, S.; Ahlberg, S.; Baisaeng, N.; Keck, C.M.; Müller, R.H.; Witte, E.; Wolk, K.; Hackbarth, S.; Röder, B.; Lademann, J.; Meinke, M.C. *Eur. J. Pharm. Biopharm.* 2015 Jan; 89:201-7. doi:10.1016/j.ejpb.2014.12.008.

In this publication the cell viability and the efficiency of the ultra-small nanostructured lipid carriers were examined in HaCaT cells.

Response: the paper has been included in text and table with some comments.

Round 1: Reviewer 2 Report and Author Response

1. This review focuses on delivery of antioxidants to the skin by means of nanocarriers. This topic is interesting and up to date both in cosmetic and pharmaceutical field. In my opinion it deserves publication after minor revisions reported below:

Introduction: niosomes and liposomes should be better defined pointing out similarity and differences.

Response: it has been better defined according to reviewer's comments.

2. Figure 1. in the text are mentioned five structures (a, b, c, d, e) while in the figure as well in the caption only structures a, b, c are reported.

Response: Figure 1 is an example of the structures.

3. As for resveratrol in nanocarriers an interesting papers should be cited and results briefly discussed. Caddeo, *et al.* Nanocarriers for antioxidant resveratrol: formulation approach, vesicle self-assembly and stability evaluation. *Colloids and Surfaces B: Biointerfaces*, 11, 327-332 (2013).

Response: It has been included.

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