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A new model of liposome-human cell interaction for iron supplying

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Approximately one third of the entire population is affected by iron deficiency, with heavy consequences on health. Its request may not be completely satisfied with a regular diet, due to a low iron bioavailability and to nutritional factors that limit its absorption.

Iron supplementation is considered a global economic and effective strategy to prevent and control anemia, in particular, during pregnancy [1]. Therefore, to develop new experimental protocols to improve its bioavailability appears very important.

Liposomes [2] are vesicular structures with double lipid layer membrane, which are proved to be particularly interesting in the biomedical field as a delivery system of pharmaceutically active substances [3].

In this study, ultrastructural analyses have been carried out to verify if liposome dehydration process induces structural alterations of lipid membranes, which could compromise carrier viability and function. Morphological integrity of Biofer and Lifervit (two new commercial iron carriers), both in liquid form and in dried powder, has been investigated by means of transmission electron microscopy on negatively stained samples [4]. Moreover, liposome interaction with U937 cell line, a well-known human model, characterized by a great phagocytic ability, has been evaluated on thin sections.

Both compounds revealed a good stability and are easily internalized into cells, interacting with cytoplasmic organelles without inducing, at least apparently, any ultrastructural damage. Therefore, Biofer and Lifervit do not cause cell toxicity, and for that they can be considered, in agreement with the current literature, potential candidates in iron vehiculation.

Further studies are in progress to evaluate their interaction in human intestinal cell models.

References

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Key words
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