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#### **Antioxidant efficacy of vitamins loaded lipid based delivery systems with different microstructure for dermal application**

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Nowadays, the interest in the development of novel dermal delivery systems for efficient therapy of skin weakened by various environmental stressors is steadily growing. Namely, environmental agents activate cutaneous inflammatory pathways and induce oxidative stress particularly by lowering the levels of antioxidants, which is associated with various skin diseases. Supporting the endogenous skin antioxidant system has been thus recognized as extremely beneficial [1, 2].

The purpose of the present work was to evaluate and compare different lipid based delivery systems for dermal administration of vitamins with antioxidant properties in terms of their stability and antioxidant activity. Dermally applicable lyotropic liquid crystals and microemulsions, all composed of the same ingredients but with different microstructure, were selected as carrier systems for simultaneous delivery of hydrophilic vitamin C and lipophilic vitamin E. The influence of selected delivery systems on the stability of incorporated antioxidants was assessed by HPLC method while their antioxidant capacity was investigated using DPPH assay.

Obtained results revealed differences in the stability among incorporated vitamins in correlation to the type of the delivery system, with lyotropic liquid crystals as most perspective formulation. Additionally, the study also demonstrated that the antioxidant efficacy of studied vitamins depends on their concentration and that the internal structure of the delivery system to some extent affects ability of incorporated vitamins to neutralize radicals.

#### References

- 1 Gašperlin M.; Gosenca M. *Expert Opin Drug Deliv.* 8(7), 905–919 (2011)
- 2 Kim K. E. et al. *Life Sci.* 152, 126–136 (2016)

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