



FORMULATION AND CHARACTERIZATION OF NANOSIZED CARRIERS AS POTENTIAL PLATFORMS FOR TOPICAL DELIVERY OF ANTIOXIDANTS

Elena Drakalska, Bistra Angelovska, Marija Sterjova, Aleksandar Cvetkovski

"University Goce Delchev" - Shtip - Faculty of medical sciences

*corresponding author: elena.drakalska@ugd.edu.mk

INTRODUCTION

Skin is protected from the harmful effects of free radicals by the presence of an endogenous antioxidant system. However, when exposed to ultraviolet (UV) radiation, there is an imbalance between pro-oxidants and antioxidants, leading to oxidative stress and photoaging of the skin. In order to prevent skin aging, use of topical antioxidants in different formulations is method of choice in pharmaceutical industry. However, many bioactive substances are unstable when exposed to light, lose activity during storage and possess low solubility and bioavailability. The aim of this study is to present the advantages of incorporation of antioxidants into nanocarriers such as niosomes, liposomes and nanoemulsions as an intriguing strategy to overcome listed limitations of antioxidants.

METHODOLOGY

We gathered the data needed for this study by searching relevant scientific and professional literature, made a comparison between antioxidant loaded nanosystems and free solutions, listed the advantages and disadvantages, discussed the results of clinical studies on various antioxidants incorporated into nanoparticles and listed the market's patented formulations by now

RESULTS AND DISCUSSION

Obtained results showed significantly higher stability of antioxidants loaded nanocarriers compared with free drug, enhanced penetration into dermis and potentiation of antioxidant effect. Results are presented on figures below.

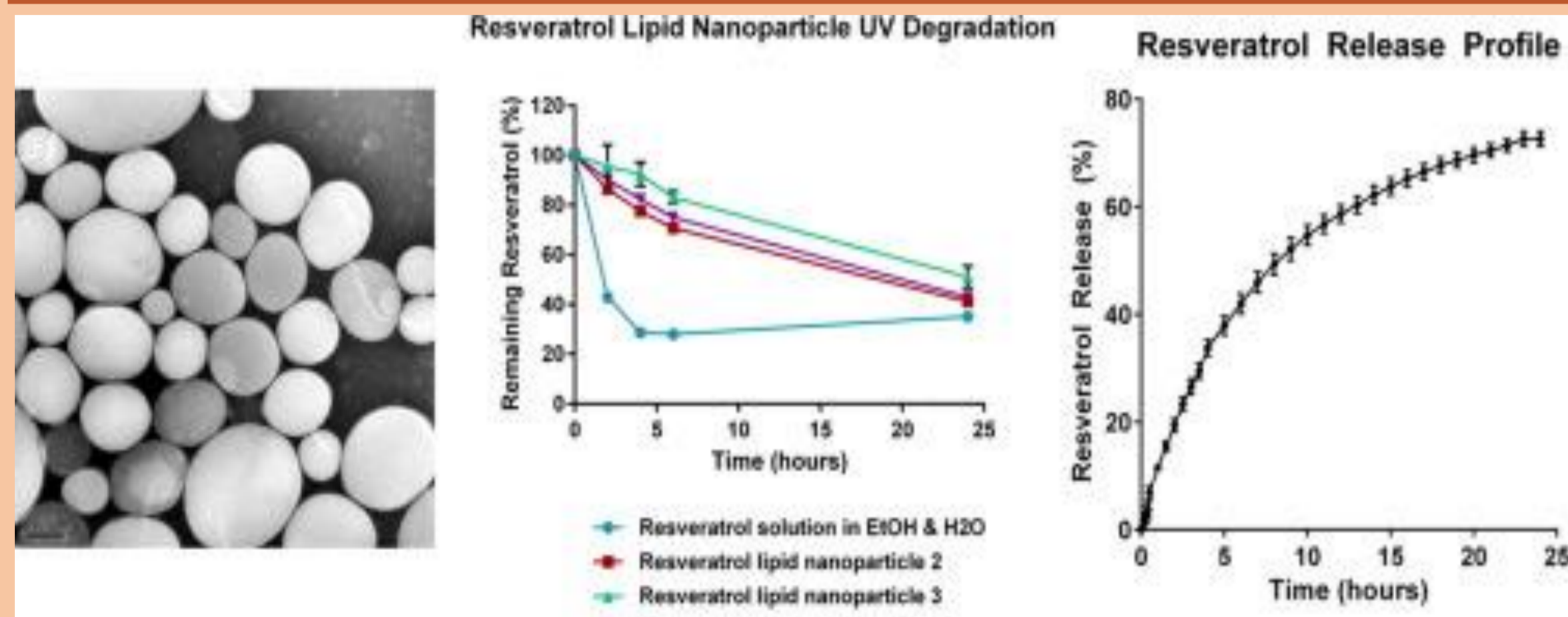


Figure 1. Protection of resveratrol from UV and release profile from SLN (Neves et al.2018)

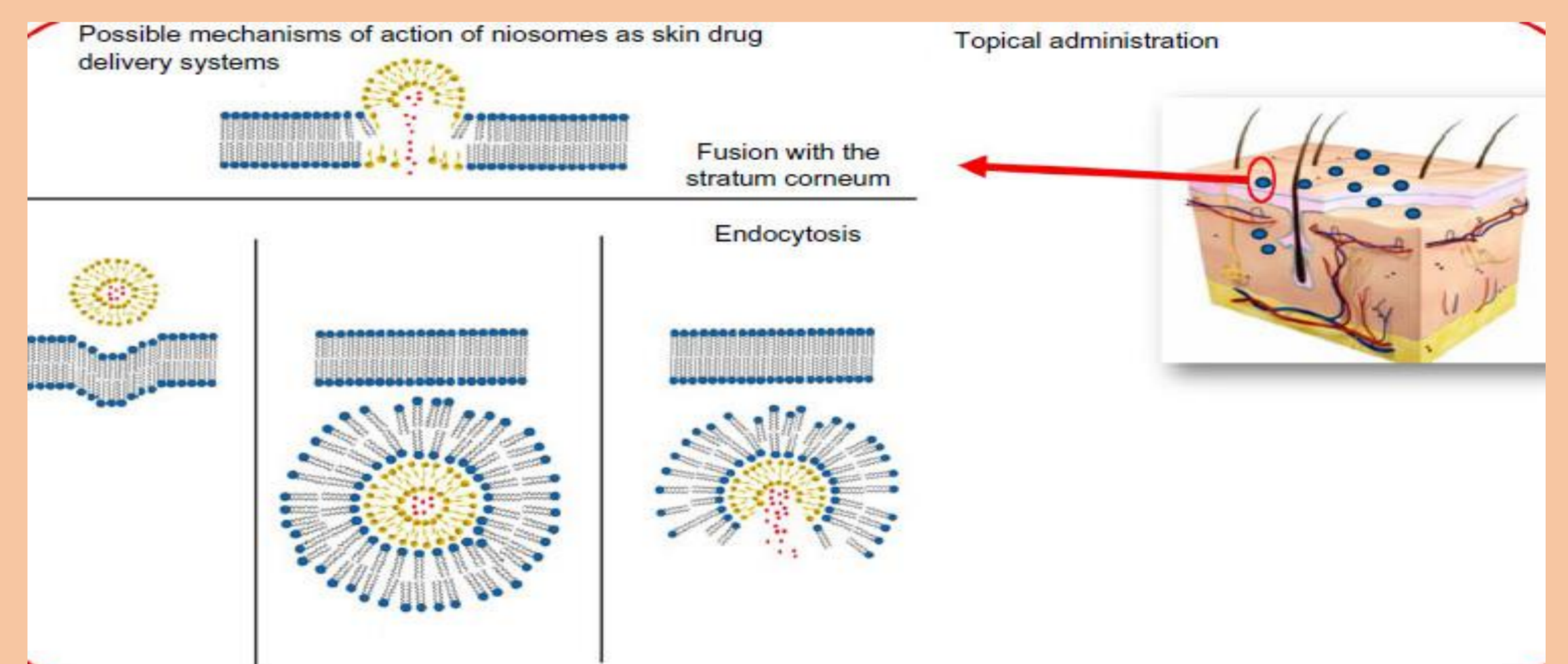


Figure 2. Mechanism of action of niosomes as skin drug delivery systems (Wang et al.2017)

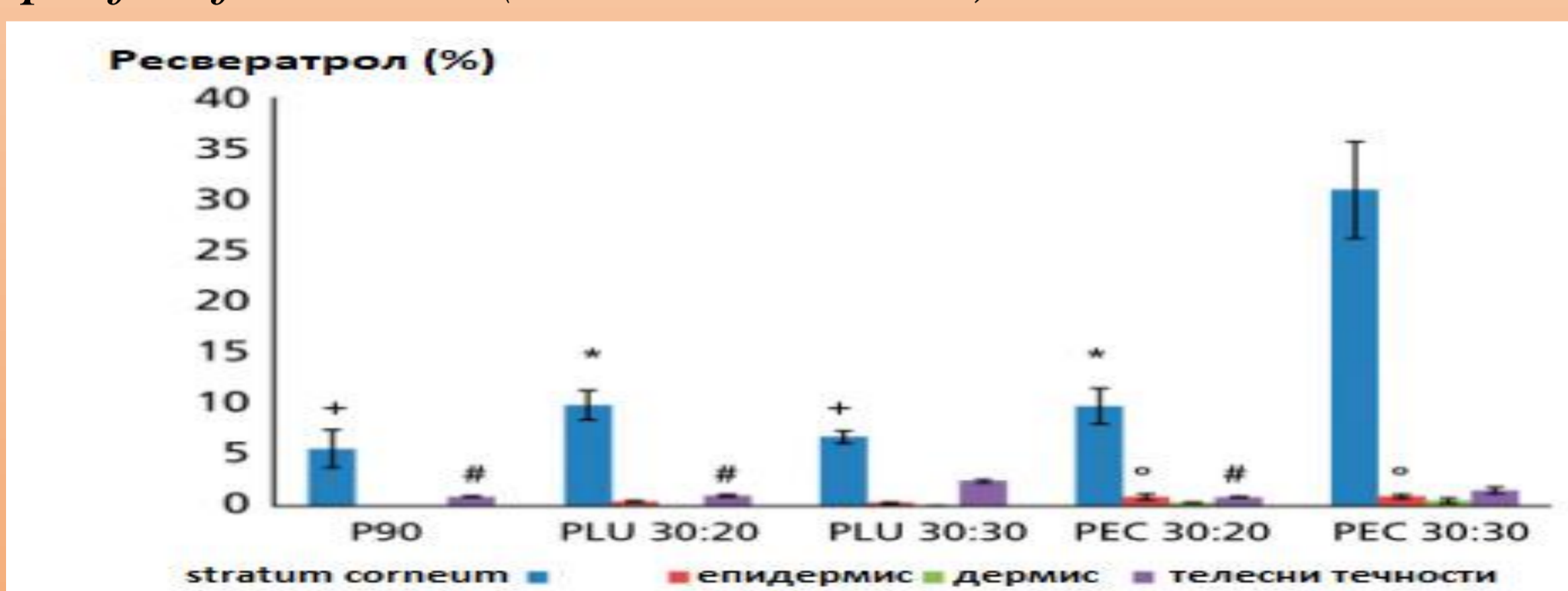


Figure 3. Percentage of resveratrol accumulation (Neves et al.2018)

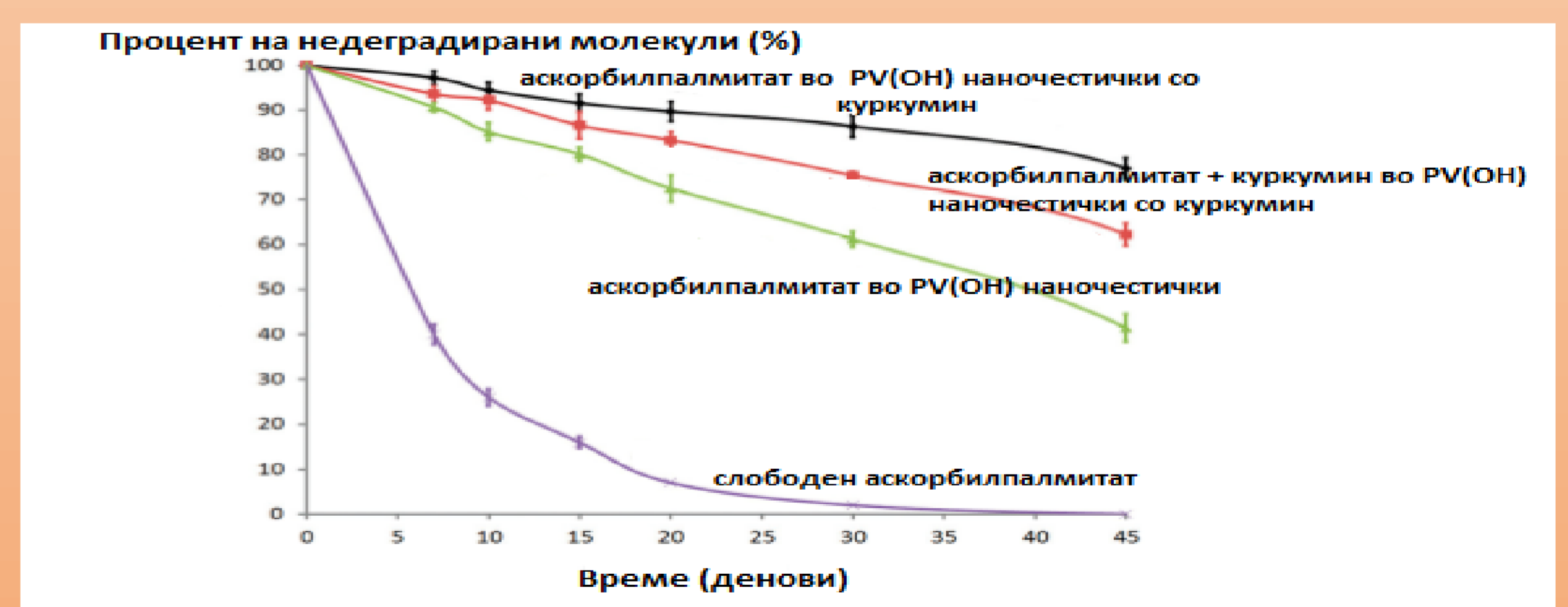


Figure 4. Stability of ascorbylpalmitate formulated into nanocarriers

CONCLUSION

From the collected and processed data we concluded that nanocarriers are potential platforms for antioxidants providing higher solubility, greater stability and enhanced bioavailability.

REFERENCES

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2. Neves, A.R., Queiroz, J.F. & Reis, S. *J Nanobiotechnol* (2016) 14: 27. <https://doi.org/10.1186/s12951-016-0177-x>