ACTA PHARMACEUTICA HUNGARICA

Scientific Journal of the Hungarian Society for Pharmaceutical Sciences

3.

2018

APHGAO 88, (043) 85–212. (2018)

Book of Abstracts

XII. CESPT

Central European Symposium on Pharmaceutical Technology and Regulatory Affairs

SZEGED

Established in 1925. by Pál Lipták

LXXXVIII. **85–212.** **ISSN 001-6659**

A C T A
PHARMACEUTICA
H U N G A R I C A
Scientific Journal of the Hungarian Society for Pharmaceutical Sciences

Contents

Acta Pharmaceutica Hungarica: www.mgyt.hu

„Acta Pharmaceutica Hungarica" Scientific papers of the Hungarian Society for Pharmaceutical Sciences
Published by the Hungarian Society for Pharmaceutical Sciences, represented by *Prof. Éva Szökő*
Gyulai Pál u. 16., Budapest, 1085 Hungary, Phone: (+36-1) 235-09-99;
E-mail: szerkesztoseg@mgyt.hu
Subscibtion: Hungarian Society for Pharmaceutical Sciences, Gyulai Pál u. 16., Budapest, 1085 Hungary by international banktransfer
(OTP bank account number: 11708001-20530530) – Mailing address: 1447 Budapest, Pf. 480
Informations for international banktransfer:
Account holder: OTP Bank Ltd. - Nádor utcai Kereskedelmi Banki Centrum
Account Number: 11708001-20530530
Bankadress: H-1051 Budapest, Nádor u. 6.
IBAN: HU20 1170 8001 2053 0530 0000 0000
Swift Code (BIC): OTPVHUHBaz MGYT átutalási számlájára: OTP VIII. kerületi fiók, Budapest, József krt. 33.
Subscibtion fee: HUF 6000 + HUF 300 VAT
Published quaterly
Typesetting: *Csaba Oláh*
Printing: ColorToys Bt.

Acta Pharmaceutica Hungarica – CESPT Edition – Committees 87. 88-89 2018.

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the current study, the physico-chemical and biological properties, as well as the antitumor activity in C26 colon carcinoma bearing mice were explored, for an optimized LCL-CURC-DOX formulation.

MATERIALS AND METHODS: Optimized LCL-CURC-DOX were prepared and characterized in terms of size, surface charge, drug loading, in vitro drug release, hemolityc activity and stability in simulated biological fluids. Further, treatments consisting of LCL-CURC (5 mg/kg), LCL-DOX (2.5 mg/kg), LCL-CURC-DOX (5 mg/kg, 2.5 mg/kg) or free drugs at equivalent doses, were i.v. administered at day 7 and 10 after C26 cell inoculationin mice, and their effects on tumor growth were evaluated. The mechanisms responsible for this antitumor activity were evaluated through markers specific for supportive processes in tumor microenvironment such as inflammation, invasion and apoptosis.

RESULTS: LCL-CURC-DOX had appropriate physico-chemical properties for i.v. administration, were stable in simulated biological fluids and hemocompatible. This formulation demonstrated the highest antitumor efficacy among all treatment tested. The antineoplastic effects were due to inhibition of the activity of the transcription factors, NF-kB and AP-1, and to alteration of Th1/Th2 cytokine balance in TME, in favor of the Th1 arm.

CONCLUSION: Our results proved that the developed nanoformulation, based on the co-encapsulation of CURC and DOX in long-circulating liposomes, met the requirements of a modern drug delivery system for future colorectal cancer therapy.

ACKNOWLEDGEMENTS: This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS-UEFISCDI, project number PN-II-RU-TE-2014-4-0220.

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Chitosan/sodium lauryl ether sulfate microcapsules as carriers for vitamin E: in vitro release study

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INTRODUCTION: The important current focus in production of cosmetics is usage of vitamin E (E), a natural antioxidant protective for tissues from UV radiation, delays photoaging and provide moisturizing effect. Encapsulation is needed for its protection from high temperature, oxygen, and light, during storage, and also for a potential ability to control its release and delivery. Preparation of microcapsules of desired characteristics depends on various factors (size and nature of the core substance, wall material, techniques and parameters of encapsulation) [1, 2]. The study aimed to evaluate chitosan/sodium lauryl ether sulfate (Ch/SLES) microcapsules with E as a delivery system for skin care.

MATERIALS AND METHODS: Microcapsules were prepared by complex coacervation. Initially, a 20% O/W emulsion with E (10% solution in medium-chain triglycerides), stabilized with the mixture of Ch (0.1 %) and SLES [3], was obtained by Ultra Turrax T25 homogenization. The emulsion, without or with a crosslinker, formaldehyde (FA) or glutaraldehyde (GA), was spray dried. The in vitro release profile of E from the microcapsule samples (0.1 g) was studied in 100 g of ethanol 80%, under continuous stirring at room temperature. The dissolved E in supernatant aliquots (2 ml) was analyzed during 90 min, by the Halo DB-20S UV-VIS spectrophotometer.

RESULTS: The obtained release profiles were analyzed by fitting in different mathematical models and in all samples correlate the best with Korsmeyer-Peppas model. The diffusion exponent n values (0.05-0.23) indicated non-Fickian diffusion. We assumed that release of E was based on a combination of rinsing from the surface of the microcapsules [4] and diffusion through the capsule wall. For microparticles with GA, n was the lowest, the release was rapid and the amount of release of the substance was higher (i.e., more pronounced rinsing process), compared with FA and microcapsules without the crosslinker, where release of E was more controlled by diffusion.

CONCLUSION: E vitamin release from Ch/SLES microcapsules followed Korsmeyer-Peppas kinetics. The selection of the crosslinker influenced their surface properties, the surface amount

and permeability of the capsule wall for E vitamine diffusion.

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Determination of the protein corona stability complex of nanoliposomes in physiological mediums

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INTRODUCTION: Due to nanosizing results in the creation of new interfaces and in a positive Gibbs free energy change, nanoliposomal dispersion is a thermodynamically unstable system with tendency of agglomeration or vesical growth. Also, upon the addition of nanoliposomes (NLs) to biological fluids, there is an almost immediate fouling of their surfaces with proteins and other cellular apparatus forming a layer known as protein corona (PC), which determines the eventual properties of NLs [1].

MATERIALS AND METHODS: In order to investigate the effect of LIPOID PE 18:0/18:0-PEG 2000 (PEG) on the in vitro stability of NLs and PC complex formation, two formulations (lechitin: cholesterol:PEG = 8.7:1:1.7 and 9:1:0.17 for S1 and S2, respectively) loaded with rosmarinic extract were prepared by the modified lipid film hydration technique [2]. Prepared NLs (200 μl) were incubated in 800 μl phosphate buffer pH 7.4 or human plasma at 37 OC for 2, 6 and 24h and analyzed in terms of particle size, particle size distribution and zeta potential (Zetasizer Nano-Series, Malvern Instr. Ltd., UK).

RESULTS: In physiological relevant medium with pH 7.4, the diameter (D) of freshly prepared NLs was 107.2 and 113.7 nm with a relatively narrow size distribution (PDI~0.27) and zeta-average of -18.5 and -45.1 mV, for S1 and S2, respectively. No significant differences were observed during the examined period of 24h. Obtained results showed that the concentration of PEG influenced the mean size and zeta potential of NLs. In human plasma, D of NLs was 111 and 123.6 nm with PDI=0.3 and zeta-average of -18.5 and -17.5 mV. S1 was stable during the period of 24h. In opposite, during the examination period of 24h, S2 showed slight reduction in the zeta potential (- 16.7 mV during first 2 h). After 6 h and gradually onto 24 h, the zeta potential became more negative (-20 mV). This could be due to PC complex formation. In late time intervals, probably there was a displacement of the plasma proteins present onto hard corona layer and formation of soft corona complex with the NLs [1].

CONCLUSION: Due to the steric stabilization, NL formulation prepared with sufficient amount of PEG showed satisfactory stability in relevant mediums and potential for prolonged circulation time, thus enabling effective drug deposition to the target site.

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Low-energy nanoemulsions with antioxidant red raspberry seed oil and fruit extracts – Influence of extract type and its quality and different polyols on EPI nanoemulsion formation and stability

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INTRODUCTION: Red raspberry seed oil is a rich source of anti-inflammatory polyunsaturated fatty acids and antioxidants while hydro-glycolic extracts made from raspberry fruit are known for carotenoids, vitamin C and tannins. To use their biological potential in effective skin care products we formulated low energy nanoemulsions (LE-