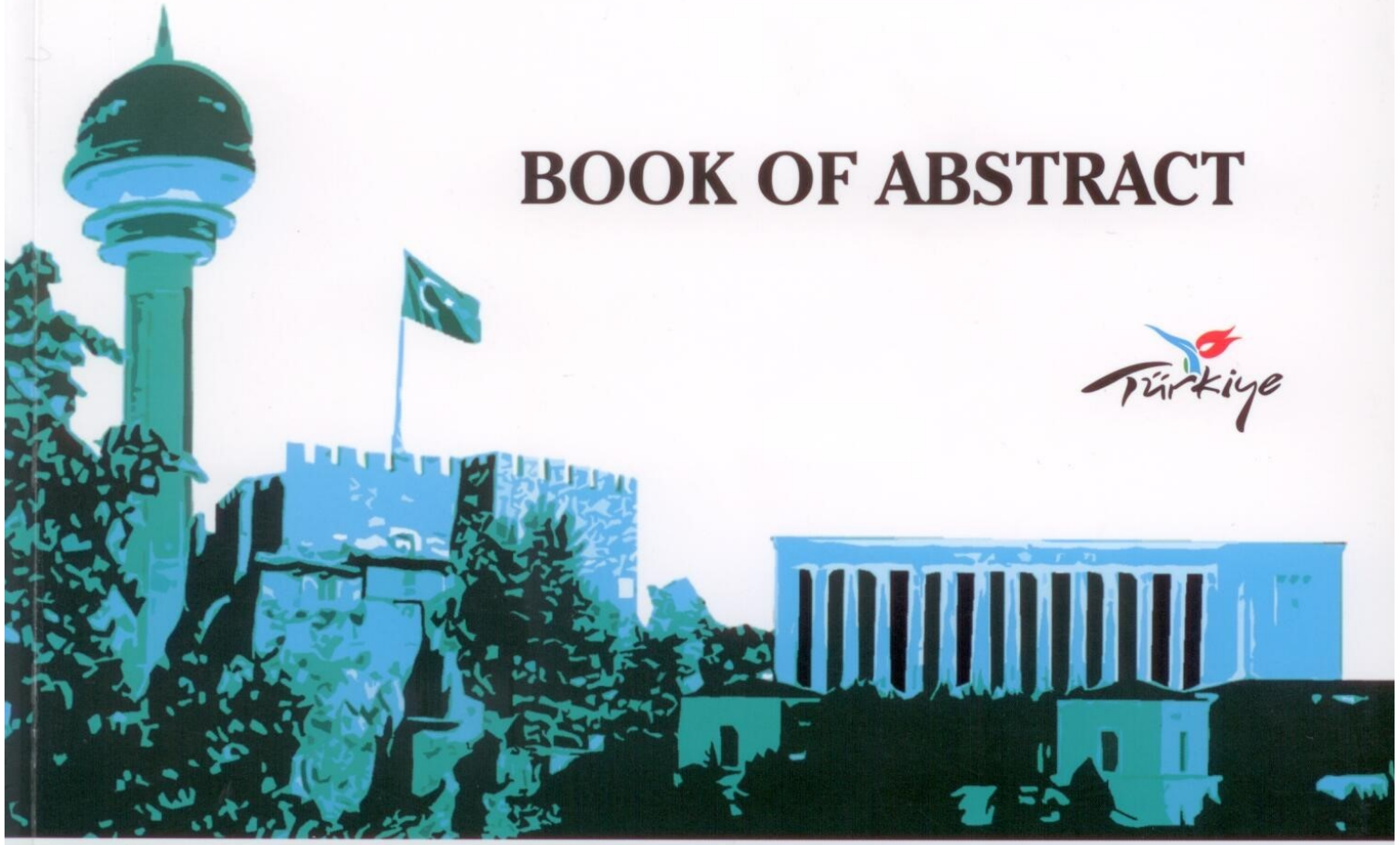
ANKARA UNIVERSITY
FACULTY OF PHARMACY

ISOPS 11th International SYMPOSIUM ON PHARMACEUTICAL SCIENCES

BOOK OF ABSTRACT



T.C.
KÜLTÜR VE TURİZM BAKANLIĞI

TUBİTAK

JUNE 09-12, 2015
ANKARA, TURKEY

In vitro Evaluation of NPs

Surface Morphology

The surface morphology of the nanoparticles was examined by scanning electron microscope (SEM) (NOVA NanoSEM 430, FEI, Czech Republic).

Determination of drug content of NPs and In vitro release study

Lyophilized nanoparticles (20 mg) in dichloromethane were sonicated for 15 minutes in ultrasonic bath and then mixed at 800 rpm for 30 minutes. To extract melatonin, phosphate buffer (PB; pH 7.4) was added into this mixture and mixed (800 rpm, 60 min.) After evaporation of organic solvent, the remaining aqueous dispersion was centrifuged at 12.000 rpm for 20 minutes. The drug content of each sample was then measured using a validated UV method at 222 nm.

In vitro release studies were performed using dialysis bag method. The freeze dried microparticles (15 mg) were suspended in PB pH 7.4 and sealed in a dialysis membrane (MWCO 14,000 Da). The sealed dialysis membrane was then placed in an amber vial containing 9 mL of PB (pH 6.8), and maintained at (37± 0.5°C, 50 rpm). At predetermined time intervals, samples (3 mL) were withdrawn from the release medium and replaced with fresh buffer. Prior to analysis, all samples were centrifuged at 12500 rpm for 10 min, and their drug content was measured by means of a validated UV method at 222 nm.

RESULTS AND DISCUSSION

Surface Morphology: The SEM image of melatonin-loaded NPs was given in Fig. 1.

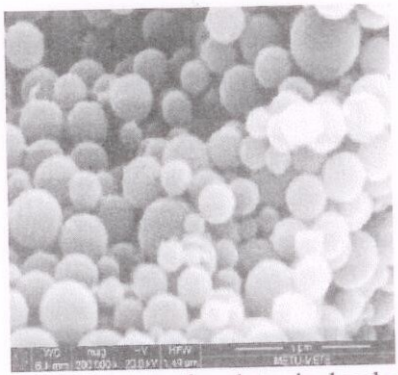


Fig. 1. The SEM image of melatonin-loaded NPs

Determination of drug content of NPs and In vitro release study: Unfortunately, the low encapsulation efficiency (3±0.02%; mean ± SD, n=2) was observed for NPs. It may be due to the leakage of melatonin to the external medium during the preparation of NPs. Thus, more attempts (modifying the preparation method of NPs or using different methods/polymers) should be carried out to improve the encapsulation efficiency of melatonin. In PB (pH 7.4), about 15% and 89% of melatonin was released at 30 minutes and 48 hours, respectively (Fig. 2).

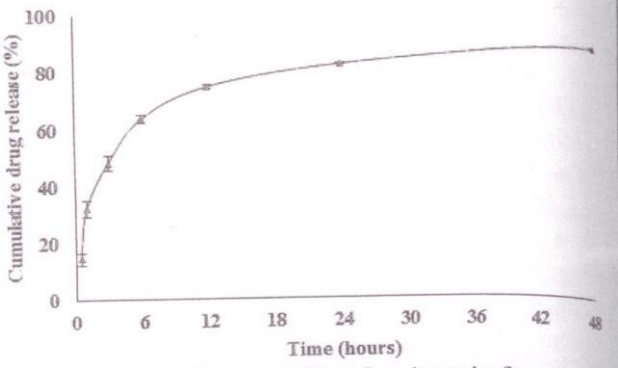


Fig. 2. *In vitro* release profile of melatonin from PLGA NPs (mean ± SD, $n = 3$)

CONCLUSION

This study reports the preparations and in vitro evaluation of melatonin-loaded PLGA NPs. It is might be useful to overcome the problems related to melatonin.

ACKNOWLEDGMENTS

This study was supported by Ataturk University Research Foundation (project number: 2013/012).

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P-62: PREPARATION AND CHARACTERIZATION OF DEXKETOPROFENTROMETHAMOL LOADED KOLLIDON-SR NANOPARTICLES

A.A. Öztürk[1], E. Yenilmez[1], Y. Yazan[1]

[1]Anadolu University, Faculty of Pharmacy, Department of PharmaceuticalTechnology, Eskisehir, TURKEY

INTRODUCTION

Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used for the treatment of musculoskeletal disorders such as osteoarthritis and rheumatoid arthritis [1]. Arylpropionic acidisamong theNSAIDs which is currently produced in the racemic form. Dexketoprofentrometamol (DT) is the dextrorotatory enantiomer of ketoprofensynthetized as tromethamine salt [2]. DT's distribution half-life and elimination

half-life are0.35 and 1.65 hours, respectively [3].Kollidon SR (KSR) is a polyvinyl acetate and povidone based matrix retarding agent[4].
Polymeric nanoparticles prepared by spray-drying method for controlled analgesic delivery of oral use was aimed in this study.

MATERIALS AND METHODS

DT was a kind gift from Abdi İbrahim (İstanbul, Turkiye). KSR was purchased from BASF, Germany and methanol from Sigma-Aldrich, Germany. Spray-drying was performed using Nano Spray Dryer B-90 (BÜCHI) with a long drying chamber.
For the preparation of polymeric nanoparticles, KSR was dissolved in methanol prior to the addition of DT.Spray-drying conditions are given in Table 1 and formulations prepared are summarized in Table 2.

Table 1. Spray Dryer conditions

Inlet Temperature	Outlet Temperature	Pump level	Spray level
120°C	54°C	3	%100

Table 2. Formulations

Code	KSR(g)	DT(g)	Methanol(mL)
KSR 0	1	-	100
KSR 1	1	0.05	100
KSR 2	1	0.1	100
KSR 3	1	0.15	100

Particle size, zeta potential and polydispersity index (PI)values of formulations were analyzed by ZetasizerNanoZS (Malvern Instruments, UK). Possible temperature-dependent structure and crystallinity changes in the nanoparticles preparedwere analyzed using differential scanning calorimetry (DSC-60, Shimadzu, Japan).

RESULTS AND DISCUSSION

Table 3. Particle size, zeta potential and PI values of nanoparticles prepared (mean± SE) (n = 3)

Code	Size (nm)	Zeta potential (mV)	PI
KSR 0	92.74 ± 0.98	-16.33 ± 0.12	0.38 ± 0.01
KSR 1	110.60 ±1.87	-16.43 ± 0.45	0.38 ± 0.01
KSR 2	226.10 ± 0.75	-16.43 ± 0.76	0.38 ± 0.01
KSR 3	357.90 ±1.72	-17.13 ± 0.17	0.39 ± 0.02

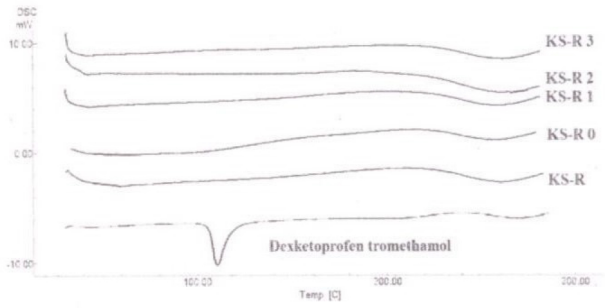


Figure 1. DSC profiles of nanoparticles prepared

CONCLUSION

KSR nanoparticles were prepared for analgesic delivery of DT by spray-drying method. Particle size, zeta potential and PI values and DSC analysis of formulations prepared confirmed the successful incorporationof DT into KSR nanoparticles. KSR formulations seem to be promising for controlled delivery of DT for oral use.

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P-63: MAGNOLOL-LOADED MESOPOROUS SILICA NANOPARTICLES FOR MODIFIED DRUG DELIVERY APPLICATIONS

A. Stefanache[1], A. Spac[1], A. M. Tomoioaga[2], L. Ochiuz[1]

[1]University of Medicine and Pharmacy "Grigore T. Popa" Faculty of Pharmacy, Iasi, Romania,
[2]"A.I.Cuza" University of Iasi, Romania

INTRODUCTION

Natural products are proved historically to be a promising pool for drug discovery and application that have reduced toxicity, less side effects and are significantly well tolerated by the human body [1]. Therefore, considerable attention is focused on development of new approaches to deliver the active ingredients of an herbal drug, in such a controlled manner to improve its therapeutic outcomes. The goal of the present study is to develop such novel delivery systems based on unique properties of mesoporous silica materials specifically designed for loading and sustained-release of magnolol. Mesoporous silica as MCM-41 and SBA-15 have ordered, non-connecting pore structure, well-defined pore geometry, and

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