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Dear Tilbe Çevikelli, February 1, 2022

Thank you for your abstract submission to **20th International Pharmaceutical Technology Symposium-IPTS 2022,** which will be held online between February 21-23, 2022.

We would like to inform you that your abstract entitled **"COL1A1 GENE STIMULATION BY KETOROLAC TROMETHAMINE LOADED NANO-SPRAY DRIED NANOPARTICLES "** has been accepted by the scientific committee for oral presentation. You can find the details of your presentation below.

We look forward to your presentation at the symposium.

Best regards,

Prof. Erem Bilensoy
Co-Chair of IPTS 2022

Prof. Levent Öner
Chair of IPTS 2022

- **The presenting author must register** to the IPTS 2022 Symposium, otherwise abstract of the oral presentation will not be included in the Abstract Book of IPTS 2022 Symposium and oral presentation will be removed from the Scientific Program as well as IPTS Awards evaluation.

- Presentations will be held online and presentation time is 5 minutes.

- The presentation time will be strictly followed by the session chairs. Oral presentations will be evaluated as candidates for **"Best Oral Presentation Award"** by the jury members and **presentation timing** will be one of the criteria for the candidates.

- Questions from the audience will be collected as written using chat box, moderator of the session will direct the question to you for your online response.

- You can check your presentation day and time slot from website (http://ipts-hacettepe.org)

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Monday, February 21	
HALL B	
Oral Presentations	
	Chairs: ***Kıvılcım Öztürk, Nazlı Erdoğdu, Selin Seda Timur***
11.00-11.05	***OP1, Özge Eşim*** *Cytotoxicity Evaluation of Methotrexate-Encapsulating Chitosan-Coated Nanoparticles*
11.05-11.10	***OP2, Fatma Betül Arslan*** *Targeting PLGA-PEG Nanoparticles to Small Cell Lung Cancer (Sclc) Using Antibodies and Antibody Fragments*
11.10-11.15	***OP3, Şeyma Adatepe*** *Effect Of Ezetimibe-Loaded PLGA Nanoparticles Functionalized with Red Blood Cell Membranes as A Biomimetic Delivery System in Obese Rat Fed A High-Fat Diet*
11.15-11.20	***OP4, Meryem Kaplan*** *Effects of Nanoparticle Shape on Cellular Uptake and Accumulation to Tumor Cells*
11.20-11.25	***OP5, Zehra Dik*** *A New Look for An Old Drug: Neuroprotective Effects of Obidoxime-Loaded Nanoparticles for The Treatment of Organophosphate Poisoning In Central Nervous System*
11.25-11.30	***OP6, Zeliha Duygu Özdal*** *Evaluation of the In Vitro Cytotoxicity and Characterization of Ondansetron Hydrochloride Loaded Nanoparticles*
11.30-11.40	Questions & Answers
11.40-11.45	***OP7, Tilbe Çevikelli*** *Col1a1 Gene Stimulation by Ketorolac Tromethamine Loaded Nano-Spray Dried Nanoparticles*
11.45-11.50	***OP8, Kıvılcım Öztürk*** *Development of Polymeric Micelle Formulation for Oral Megestrol Acetate Delivery*
11.50-11.55	***OP9, Naile Öztürk*** *In Vitro Evaluation of Doxorubicin and Telmisartan Loaded Lipid-PLGA Hybrid Nanoparticles on Breast Cancer Cells*
11.55-12.00	***OP10, Hümeyra Şahin Bektay*** *Bisabolol and Isoconazole Co-Loaded Liposomes for Antifungal Drug Delivery*
12.00-12.05	***OP11, Sema Arısoy*** *Preparation of Ace2 Loaded Decoy Liposomes by Extrusion Method for The Treatment of Covid-19*
12.05-12.10	***OP12, Meryem Aydın*** *Preparation and Characterization of Metoclopramide Nanostructured Lipid Carrier Loaded in Situ Gel*
12.10-12.15	***OP13, Gizem Rüya Topal*** *Development Of Different Lipid Nanoparticles and Evaluation of Bacteria-Nanoparticles Interactions*
12.15-12.25	Questions & Answers
12.25-12.30	***OP14, Ulya Badıllı*** *In Vivo Evaluation on Fluticasone Propionate Loaded Semi-Solid Lipid Nanoparticle Dispersions*
12.30-12.35	***OP15, Büşra Arpaç*** *Oral Delivery of Peptides: Development of Solid Lipid Nanoparticles by Microfluidic Technique*
12.35-12.40	***OP16, Burcu Üner*** *Physicochemical Characterization Studies of Niosome Formulations for Ocular Applications*
12.40-12.45	***OP17, Safiye Akkın*** *Safety And Efficacy of Cyclodextrin Polymer-Based Nanoplexes Carrying 5-Fu and Il-2 In Colon Cancer-Induced Mouse Model*
12.45-12.50	***OP18, Esra Pezik*** *Investigation of the Effect of Freeze Drying with Different Cryoprotectants on In-Vitro Cytotoxicity of M3 Nanocrystals*
12.50-12.55	***OP19, Sıla Gülbağ Pınar*** *Evaluation of Biochemical and Immunological Parameters of New Developed Cyclosporine A Nanosuspension*
12.55-13.00	***OP20, Ayça Güngör Ak*** *In Vitro Characterization of Berberine Phytosome and Berberine Phytosome Loaded Chitosan Microparticles*
13.00-13.10	Questions & Answers

OP-07
COL1A1 GENE STIMULATION BY KETOROLAC TROMETHAMINE LOADED NANO-SPRAY DRIED NANOPARTICLES

A. Alper Öztürk[1], Tilbe Çevikelli[2], Umay Merve Güven[2], Elif Kaya Tilki[3]

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INTRODUCTION

Ketorolac tromethamine (KT) is a non-steroidal anti-inflammatory drug (NSAID) from the heteroaryl acetic acid derivatives class that acts as a non-selective COX inhibitor. KT is often used successfully in post-surgical (postoperative) pain and surgical wounds [1]. The most widely used new nanotechnological approaches for topical drug delivery are nanoparticles (NPs) prepared with natural polymers, polymeric NPs, nano-emulsions, lipid-based nanoparticles, metal nanoparticles and dendrimers [2]. Spray drying is one of the most extensively studied processes in the pharmaceutical field. It is frequently used for drug formulations to be used topically [3]. Fibre-forming collagen type I, encoded by the COL1A1 gene, is the most common collagen in the skin, accounting for 90% of the total. Systemic organization of tissue is crucial for wound healing as it is vital to its integrity and strength [4]. If the physiologically inflammatory response in wound healing is prolonged or exacerbated, it leads to a delay in the later stages of proper wound healing. In this case, anti-inflammatory agents are needed [5]. Within the scope of this study, KT loaded nanoparticle-based drug delivery systems, which can be effective in pain treatment and wound healing processes in postoperative conditions, were prepared. After the characterization procedures, the cytotoxicity of the optimum formulation in human fibroblast cells was determined by the WST-1 method and the gene activity was elucidated by mRNA isolation and real-time polymerase chain reaction (RT-PCR).

MATERIALS AND METHODS

Materials

KT is kind gift from Deva İlaç (Istanbul, Turkey). All other chemicals used were of analytical grade.

Method

NPs were prepared using Nano Spray-Dryer (B-90, Büchi Labortechnik AG, Switzerland).

Cell Culture

BJ (ATCC® CRL-2522™) human fibroblast cells were cultured in 10% fetal bovine serum and 1% penicillin/streptomycin containing Eagle's Minimum Essential Medium (EMEM) growth medium at 37 °C in a humidified incubator with 5% CO_2.

Cell Viability Assay

5×10^3 cells were seeded in 96-well plates. After 24 h, controls, KT, KT-Blank and KT-NP were added to wells at 25, 50, 100, 200 and 400 µg/mL concentrations and incubated. 10 µl WST-1 solution was added to each well and after 3 h, the absorbances were measured at 450 nm. The measured absorbance directly correlates with the number of viable cells. Cell viability rates were expressed as a percentage of the control value.

mRNA Isolation and RT-PCR

$1x10^6$ BJ cells were seeded at 6-well plates. Cells were treated with 25, 100 and 400 µg/mL KT and KT-NP concentrations and incubated for 24 h. mRNA was isolated from the cells according to the MagNA Pure Compact RNA Isolation Kit® protocol. cDNA was obtained using the Transcriptor High Fidelity cDNA Synthesis Kit®. The expression levels were determined with the LightCycler® 480 Real-Time PCR System using the COL1A1 primer. Glucose-6-phosphate dehydrogenase (G6PD) was used as housekeeping gene.

Statistical Analysis

Results were statistically analysed with one-way ANOVA and Tukey's post hoc test.

RESULTS AND DISCUSSION

Effects of Ketorolac Tromethamine Loaded Nanoparticles on Fibroblast Cell Viability

Cell viability results are presented in Figure 1, Figure 2 and Figure 3. According to the results, even though the KT-Blank reduced cell proliferation significantly, the lowest concentration of KT-NP was increased the fibroblast cell proliferation higher than the highest concentration of KT.

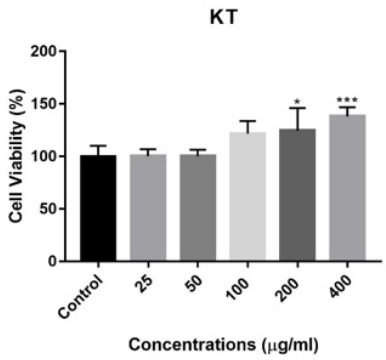

Figure 1. Effects of KT on BJ cell viability.

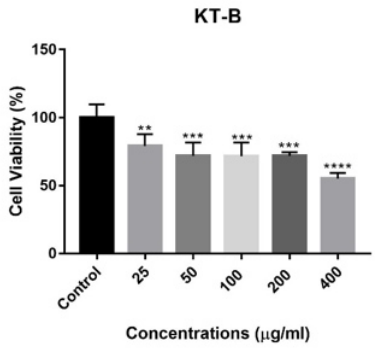

Figure 2. Effects of KT-Blank (KT-B) on BJ cell viability.

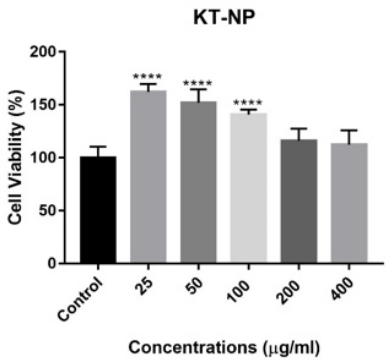

Figure 3. Effects of KT-NP on BJ cell viability.

Effects of Ketorolac Tromethamine Loaded Nanoparticles on COL1A1 Gene Expression Levels

The effects on COL1A1 gene expression levels were tested at the most effective concentrations of KT (400µg/ml) and KT-NP (25 µg/ml) on fibroblast proliferation and COL1A1 expression levels were increased 5.94 and 25.08-fold, respectively (Figure 4).

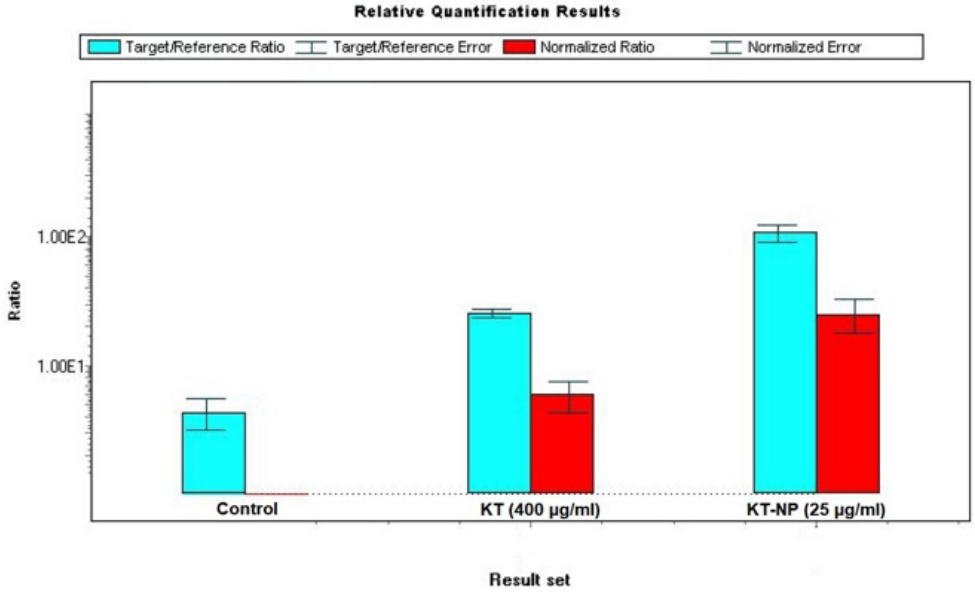

Figure 4. Effects of KT and KT-NP on mRNA expression levels of COL1A1 gene.

CONCLUSION

KT-loaded nanoparticles were produced in a nano-spray-drying device. With the obtained cell viability and gene expression results, it has the hope of a successful nano-topical formulation especially in wound healing.

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