ANKARA UNIVERSITY
FACULTY OF PHARMACY

ISOPS 13th International SYMPOSIUM ON PHARMACEUTICAL SCIENCES

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JUNE 22-25, 2021
ANKARA, TURKEY

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Dear Participants and Guests,

I would like to express my sincere appreciation for the valuable contributions of all the participants of 13th International Symposium on Pharmaceutical Sciences (ISOPS). As we all know, the COVID-19 pandemic is still ongoing and the vaccination programmes are proceeding throughout the world. However, during 2021 we continue to face travel bans, governmental and contract restrictions in many countries. Therefore, the symposium was organized as a virtual event for the first time in its history.

ISOPS, initiated in 1989, has successfully brought international scientists, researchers, students together from pharmaceutical sciences and related areas. This symposium was organized biannually until 1997 and then every three years.

Ankara University, Faculty of Pharmacy is the first faculty of pharmacy in Turkey and was established in nineteen sixty (1960). Since the establishment, the institution rapidly progressed and now has very advanced scientific and physical infrastructure. Pharmaceutical science refers to a category of scientific fields and has followed important development processes, mainly in line with the developments in Biotechnology, Nanotechnology and Health Technologies, which are among the priority of the technology fields of today. While realizing the modern requirements, our Faculty has a 5-year undergraduate education programme since 2005 and besides Turkish; it provides an instruction programme in English language since 2015. Our faculty has 6689 graduates since its establishment and the current number of students is 1267. Present educational and scientific resources allow a total of 138 faculty members, 45 professors, 22 associate professors, 5 assistant professors, 51 research assistants in our faculty. Moreover, 66 administrative staff members and other personnel are working at different offices.

The mission of 13th International Symposium of Pharmaceutical Sciences was to perform a broad scientific perspective by the invitation of distinguished scientists having national / international reputation in their areas, so most recent advances were discussed interactively, and to empower the knowledge-based drug research development and multidisciplinary collaborations. It was our intention to make this symposium a memorable event.

This year, scientists from 24 countries registered to ISOPS-13. Our programme consisted of 40 plenary lectures, 212 oral and 200 poster presentations. Excellent research works were presented in different sessions. The speakers in the programme were uniquely placed in accordance to their area of expertise.

I would like to refer also to other initiatives that took place in our symposium. A workshop on "Employability of the Graduates of the Faculty of Pharmacy in Europe" was held with the contribution of Prof. Luciano Saso, Prof. Claire Anderson, Prof. Lilian M. Azzopardi, Prof. Sibel Süzen, Prof. İlkay Erdogan Orhan and Pharm. Nilhan Uzman. This workshop was interesting in terms of discussing the priorities and developments on this topic from local, regional and international respects.

On June 25, our panel on "University-industry-public sector cooperation in drug and vaccine development processes" was carried out by Prof. Dr. Asuman BOZKIR. The heads and *senior representatives of relevant institutions* including; Prof. Hasan Mandal, Assoc. Prof. Tolga Karakan, Pharm. Dr. Nihan Burul Bozkurt, Prof. Erhan Akdoğan, Assoc. Prof. Rabia Çakır Koç, Prof. Mayda Gürsel, Prof. Rana Sanyal, Prof. Hülya Ayar Kayalı, Dr. Süha Taşpolatoğlu, Dr. Hasan Ersin Zeytin, and Pharm. Dr. Ferhat Farşi were with us. This event has been a great platform to discuss the existing practices and requirements, and to propose solutions.

On behalf of the Organizing Committee, I would like to mention my gratitude to the President of Ankara University who gave full support for the Symposium Organization. ISOPS-13 was organized successfully, without any professional support, with the contribution of all our faculty members, especially our symposium secretary Assoc. Prof. Zerrin Sezgin-Bayındır. I congratulate the organizing committee and all the other committees with all my heart, as well as all academic and managing personnel because of their extensive work.

Prof. Dr. Asuman BOZKIR

Chair of ISOPS-13

Honory President of the Symposium

Prof. Dr. Necdet ÜNÜVAR

President of Ankara University

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ORAL PRESENTATIONS

obtaining promising results in terms of sensitivity, extraction yields, precision and accuracy

Conclusions: The developed analytical platform represents a promising and versatile tool allowing the evaluation of a broad panel of Trp-related compounds in miniaturised biosamples. The methodology is being applied for the analysis of miniaturised samples and will allow to evaluate specific TRP metabolites that could potentially have a role in the onset and progression of ALS.

Acknowledgements

This research was financially supported by the Research Projects of National Relevance (PRIN) 2017 funds (Italian Ministry of Education, University and Research, 20173EAZ2Z).

References:

1. Platten et al., (2019). Nat Rev Drug Discov, 18:379-401.
2. Londhe V, Rajadhyaksha M (2020). J Pharm Biomed Anal, 182:113102.

OP133: FABRICATION OF 2D-G-C_3N_4/SDS/GNPS AS AN ELECTROCHEMICAL SENSOR FOR BIOMEDICAL APPLICATION

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Introduction: Doxorubicin is a famous anticancer drug with many side effects that make it crucial to determine it in an actual sample. Doxorubicin (DOX) is commonly used to treat childhood solid tumours, lymphoma, ovarian, lung, and bladder cancer (1). It is significant because cancers cause many deaths each year worldwide. Most cancers are treated with antineoplastic drugs such as doxorubicin and 4′-epidoxorubicin(Epirubicin), which have many side effects. Therefore, monitoring these drugs in real biological samples has great importance in clinical diagnosis.

Materials and Methods: Doxorubicin, melamine ($C_3H_6N_6$), graphene nanoplatelets (GNPs), sodium dodecyl sulfate (SDS) were purchased from Sigma Aldrich company, and screen printed electrodes (SPE) were purchased from Metrohm DropSens. All of these substances are analytical grade, and water di-ionized were utilized. Britton-Robinson buffer (B-R) was used in all steps. Firstly, 2D-g-C_3N_4/SDS/GNPs as a novel sensor was synthesized and characterized. Then, The SPE electrode was modified with a certain concentration of nanocomposite. The electrochemical properties of the developed were observed by several methods such as differential pulse voltammetry (DPV), cyclic voltammetry (CV), and chronoamperometry (CA) under optimal conditions.

Results: The 2D-g-C_3N_4/SDS/GNPs was characterized by XRD, SEM, TEM, EDX and FT-IR, and 2D-nanostructure confirmed. The developed sensor exhibited excellent electrochemical performance, such as a wide dynamic range from 0.08-1.1 and 1.1-12.8μM, a low limit of detection (LOD) of 0.06 μM, and good reproducibility and repeatability. The modified electrode was utilized to detect DOX in biological samples and showed appropriate recovery and RSD.

Conclusions: The 2D-g-C_3N_4/SDS/GNPs/SPE were found to be excellent for the determination of DOX. The principal advantage of the 2D-g-C_3N_4/SDS/GNPs/SPE is sensitivity and selectivity in the presence of interfering agents. An enhanced oxidation current was observed in the case of 2D-g-C_3N_4/SDS/GNPs/SPE. The possibility of monitoring the DOX in human plasma makes the voltammetric method useful for biological purposes.

Acknowledgements

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References:

1. Minotti et al., (2004). Pharmacological reviews, 56(2), 185-229.

OP134: QSRR-ANN MODELLING IN β-CD-MODIFIED RP-HPLC

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Introduction: Cyclodextrin (CD) added to RP-HPLC mobile phase interacts with analytes, solvent components and stationary phase surface. Therefore, the retention is influenced by the analyte's distribution between CD dissolved in the mobile phase, free CD and formed inclusion complex adsorbed onto the stationary phase, and stationary phase itself (1, 2). The research goal was to reveal the structural characteristics affecting the inclusion complexation and retention in these kinds of chromatographic systems by employing QSRR-ANN models.

Materials and Methods: Mixed QSRR model included large pool of molecular descriptors, complex association constants and experimental parameters towards the retention factor of risperidone, olanzapine and structurally related impurities. The experimental space was adequately covered with central composite design, while experiments were conducted on Dionex Ultimate 3000 (U) HPLC. QSRR-ANN modelling was performed in STATISTICA Neural Networks.

Results: To evaluate the individual influence of each of the descriptors, the difference in the highest and lowest retention factor value across the investigated range of the descriptor's values was calculated. The highest ratios were associated with the following descriptors RDF075m, UE, Mor04v and CATS2D_08_PL, making them the most contributing towards the selected output. RDF075m descriptor shows the three-dimensional mass distribution calculated at a distance of 7.5 Å from the geometrical centre of the molecule and it refers to steric factors at the same distance. Groups approximately 7.5 Å distant from the geometrical centre of risperidone, olanzapine and related compounds in their optimized conformations were determined. These groups were the same ones involved in the complexation process according to previously performed NMR study. Identified groups and their steric factors are the most important for the formation of inclusion complexes, and, in this way, the value of RDF075m contributes to the retention of the selected compounds. The importance of Mor04v confirms the influence of molecular size and shape in retention in these kinds of chromatographic systems, while CATS2D_08_PL accounts for lipophilicity.

Conclusions: The current study resulted in development of QSRR-ANN with remarkable performances, which enabled the elucidation of the molecular features significantly influencing the retention in β-CD-modified RP-HPLC. The pronounced effect of molecular structure on retention was best described through RDF075m, followed by UE, Mor04v and CATS2D_08_PL. Retention behaviour is also highly affected by molecular size and shape, as well as lipophilicity of the investigated compounds. Moreover, the size and polarity of the chosen CD should not be neglected, due to the consequent structural fit.

Acknowledgements

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References:

1. Dodziuk H (2006). Cyclodextrins and their complexes: chemistry, analytical methods, applications. John Wiley & Sons.

2. Szente et al., (2016). Journal of Pharmaceutical and Biomedical Analyses, 130:347-65.

OP135: ELECTROCHEMICAL INVESTIGATION OF SURFACTANT EFFECT ON THE ETODOLAC AND THIOCOLCHICOSIDE SIGNALS

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Introduction: Etodolac (ETO) and Thiocolchicoside (TCC) are used in combined form in order to provide a rapid analgesic effect on especially serious pain cases such as vertebral colon syndrome, severe trauma, and surgery operations. The combined form does not change the pharmacokinetic properties of both drugs. It has also a synergetic effect on the analgesic feature. Therefore, it is very important to determine the concentration of each drug found in pharmaceutical preparations for quality control studies (1). The main purpose of the present study is to demonstrate a novel approach based on electrochemical oxidation of ETO and TCC at modification-free glassy carbon electrode (GCE) in the presence of sodium dodecyl sulphate (SDS). This study is the first electrochemical method which is used for the simultaneous determination of ETO and TCC.

Materials and Methods: A conventional three-electrode cell was connected to PalmSens EmStat 3 potentiostat (DropSens, Metrohm, Turkey) with PSTrace 5.5 software for electrochemical measurements. For voltammetric measurements, the required concentration of ETO and TCC were taken and diluted with Britton-Robinson (BR) buffer (pH 6.0 including 20% methanol and 70 µM SDS). Recovery studies have been carried out to examine the accuracy of the proposed method and to check interference of common excipients using Etotio® tablets (each film-coated tablet containing 400 mg ETO and 8 mg TCC). The standard addition method was used for the recovery studies.

Results: In this study, the voltammetric response of TCC was improved almost 2-fold when SDS was present in the electrolyte solution at pH 6.0. Moreover, the oxidation signals at around +0.63 V for ETO and +1.37 V for TCC allowed simultaneous determination of ETO and TCC with differential pulse voltammetry (DPV). The calibration curves were linear for both drugs over concentration ranges of 1–80 µM, with detection limits of 0.11 µM for ETO and 0.20 µM for TCC. In order to test the precision of the developed method, the relative standard deviation values of peak currents were