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ARHIV ZA FARMACIJU

ČASOPIS SAVEZA
FARMACEUTSKIH UDRUŽENJA SRBIJE

4S/2022

“THE RIGHT TIME FOR PHARMACY PULSE”

October 12-15, 2022 in Belgrade,
Republic of Serbia

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A Word from the Guest Editor

This supplement issue of the Archives of Pharmacy includes abstracts from the *8th Congress of Pharmacists of Serbia with international participation*, held in Belgrade from October 12 to 15, 2022, and organized by the Pharmaceutical Associations of Serbia (SFUS).

The slogan of the congress "The right time for the pharmacy pulse" sends a symbolic message that it is high time to remove our masks, to acknowledge the scientific achievements in the previous period, to reflect on the contribution of the pharmaceutical community during the COVID-19 pandemic and, empowered with new knowledge, look forward to the future scientific and health challenges.

The members of the Scientific Committee of *8th Congress of Pharmacists of Serbia with international participation* built the main program covering the multidisciplinary of pharmaceutical science, pharma digitalization, and demands for the integral approaches in different areas where pharmacists work. The scientific program of the congress includes 4 plenary lectures, 81 invited lectures, 31 oral presentations and more than 170 poster presentations from various fields of pharmaceutical science.

Top experts and scientists involved in the contemporary research shared new achievements and directions in pharmaceutical science; while the specialists from professional practice, presented how evidence-based pharmacy improves the use of medicines and better health outcomes.

I would like to acknowledge all the members of the Scientific Committee of the *8th Congress of Pharmacists of Serbia* for their outstanding engagement and teamwork in proposing the lecturers within 25 sessions of the main program of the congress, reviewing submitted abstracts and moderating individual sessions.

On behalf of the Scientific Committee of the *8th Congress of Pharmacists of Serbia*, I thank all the lecturers and authors of the poster presentations for their significant contribution to the quality of the congress, believing that we will continue to push the boundaries of science through curiosity and to advance our pharmaceutical profession.

Without further ado, enjoy reading this excellent supplement issue of Archives of Pharmacy!



Prof. Katarina Vučićević, PhD PharmD
President of the Scientific Committee
8th Congress of Pharmacists of Serbia

Reč gostujućeg urednika

Ovaj dodatak broju Arhiva za farmaciju obuhvata sažetke radova sa *VIII Kongresa farmaceuta Srbije sa međunarodnim učešćem*, koji se održava u Beogradu 12-15. oktobra 2022. godine, u organizaciji Saveza farmaceutskih udruženja Srbije (SFUS).

Slogan VIII Kongresa „*Pravo vreme za pravo lice farmacije*“ šalje simboličnu poruku, uz želju da skinemo maske, sagledamo naučna dostignuća u prethodnom periodu, doprinos farmaceutske zajednice tokom pandemije COVID-19 i, uz nova znanja, se okrenemo budućim naučnim i zdravstvenim izazovima.

Članovi Naučnog odbora *8. Kongresa farmaceuta sa međunarodnim učešćem* su osmislili program sa ciljem da obuhvati multidisciplinarnost farmaceutskih nauka, mesto digitalizacije u različitim granama farmacije i potrebu za integrativnim pristupima u svim sferama gde farmaceuti rade. Naučni program Kongresa obuhvata 4 plenarna predavanja, 81 predavanje po pozivu, 31 usmeno saopštenje i preko 170 poster prezentacija iz različitih oblasti farmaceutskih nauka.

Vrhunski stručnjaci i naučnici, uključeni u savremena istraživanja, su podelili nova dostignuća i stremljenja u različitim poljima farmaceutskih nauka; dok su eksperti iz stručne prakse, koji u centar stavljaju pacijenta, predstavili svoja iskustva u implementaciji najnovijih naučnih dokaza za poboljšanje upotrebe lekova i zdravstvenih ishoda.

Veliku zahvalnost dugujem svim članovima Naučnog odbora *VIII Kongresa farmaceuta Srbije* na izuzetnom angažovanju i timskom radu u osmišljavanju i izboru predavača u okviru 25 sesija glavnog programa Kongresa, recenziranju pristiglih sažetaka i moderiranju pojedinačnih sesija.

Ispred Naučnog odbora *VIII Kongresa farmaceuta Srbije* zahvaljujem se predavačima i autorima poster prezentacija na njihovom doprinosu kvalitetu Kongresa, uz iskrenu veru da ćemo nastaviti da pomeramo granice nauke kroz istraživačku radoznalost i unapređujemo našu farmaceutsku struku.

Uživajte u čitanju ovog dodatka broju Arhiva za farmaciju!



Prof. Dr Katarina Vučićević
predsednica Naučnog odbora
VIII Kongresa farmaceuta Srbije sa međunarodnim učešćem

Dodatak broju 4 Arhiva za farmaciju, Oktobar 2022

Abstracts from the 8th Congress of Pharmacists of Serbia with international participation "The right time for pharmacy pulse" – October 12-15, 2022 in Belgrade, Republic of Serbia

Sažeci radova sa VIII Kongresa farmaceuta Srbije sa međunarodnim učešćem „Pravo vreme za pravo lice farmacije“ – 12-15. oktobar 2022. Beograd, Republika Srbija

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VIII CONGRESS OF PHARMACISTS OF SERBIA WITH INTERNATIONAL
PARTICIPATION

October 12-15, 2022, Hotel Crowne Plaza, Belgrade, Serbia

VIII KONGRES FARMACEUTA SRBIJE SA MEĐUNARODNIM UČEŠĆEM

12-15. oktobar 2022. Hotel Crowne Plaza, Beograd, Srbija

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THE USE OF MULTIMODAL CHROMATOGRAPHY IN THE CONTROL OF PHARMACEUTICAL PRODUCTS: NEW POSSIBILITIES AND NEW CHALLENGES

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Liquid chromatography which implies that an analyte interacts through several separation mechanisms (modes) with a stationary phase packed in a single chromatographic column is called multimodal or mixed-mode chromatography (MMC). Based on the combined modes, MMC is seen as bimodal (RP/HILIC, RP/IEX, HILIC/IEX) or trimodal (different RP/HILIC/IEX combinations) system. Consequently, compounds that encompass wide spectra of properties (nonpolar, polar, organic, inorganic, ionized and/or non-ionized) can be chromatographed in a single chromatographic run. The main practical achievement of this is the reduction of the number of required analyses needed per one complex sample compared to unimodal chromatographic systems. Therefore, the popularity of MMC grows rapidly in recent years together with the number of its applications (1). Beside common quality control issues that include active pharmaceutical ingredients and related substances analysis and impurity profiling, the range of different analytes which MMC successfully handles extends to the analyses of drugs in environmental and biological samples, peptides and proteins. Since nearly half of recently FDA approved pharmaceutical substances are in the form of a salt, the focus of MMC turned to pharmaceutical counterions analyses as well (2). However, separations are governed by numerous intermolecular interactions resulting from specific analyte's properties (size, charge, polarity) and mobile phase composition (aqueous phase ionic strength and pH value, organic solvent content) while the quality of separation can also be affected by column temperature and mobile phase flow rate. Eventually, analytical method development is challenging and demands the assistance of multifactorial optimization strategies such as the design of experiments.

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2. Zhang K, Liu X. Mixed-mode chromatography in pharmaceutical and biopharmaceutical applications. *J Pharm Biomed Anal.* 2016;128:73-88.

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PRIMENA MULTIMODALNE HROMATOGRAFIJE U KONTROLI FARMACEUTSKIH PROIZVODA: NOVE MOGUĆNOSTI I NOVI IZAZOVI

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Tečna hromatografija koja podrazumeva da analit interaguje putem nekoliko mehanizama razdvajanja (modova) sa stacionarnom fazom upakovanom u jednu istu hromatografsku kolonu naziva se multimodalna hromatografija (MMC). Na osnovu kombinovanih modova, MMC se posmatra kao bimodalni (RP/HILIC, RP/IEX, HILIC/IEX) ili trimodalni (različite RP/HILIC/IEX kombinacije) sistem. Ovo za posledicu ima da jedinjenja širokog spektra svojstava (nepolarna, polarna, organska, neorganska, jonizovana i/ili nejonizovana) mogu se hromatografisati u jednom ciklusu hromatografije. Glavni praktični doprinos ovoga je smanjenje broja potrebnih analiza po jednom složenom uzorku u poređenju sa unimodalnim hromatografskim sistemima. Zbog toga, popularnost MMC naglo raste poslednjih godina zajedno sa brojem njenih aplikacija (1). Pored uobičajenih pitanja kontrole kvaliteta koja uključuju analizu aktivnih farmaceutskih sastojaka i srodnih supstanci i profilisanje nečistoća, opseg različitih analita sa kojima MMC uspešno pokriva proširen je analitikom lekova iz prirodnog okruženja i bioloških uzoraka, peptidima i proteinima. Pošto je skoro polovina farmaceutskih supstanci koje je nedavno FDA odobrila u obliku soli, fokus MMC je orjentisan i ka analizi farmaceutskih kontraceptiva (2). Međutim, hromatografsko razdvajanje je vođeno brojnim intermolekularnim interakcijama koje su rezultat specifičnih svojstava analita (veličina, naelektrisanje, polaritet) i mobilne faze (jonska jačina i pH vrednost vodene faze, sadržaj organskog rastvarača), dok na kvalitet razdvajanja može uticati i temperatura kolone i brzina protoka mobilne faze. Na kraju, razvoj analitičkih metoda predstavlja izazov i zahteva podršku u strategijama multifaktorske optimizacije kao što je dizajn eksperimenata.

Literatura

1. Sýkora D, Řezanka P, Záruba K, Král V. Recent advances in mixed-mode chromatographic stationary phases. *J Sep Sci.* 2019;42:89-129.
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