

OSOBNE INFORMACIJE

Nada Božina



ZVANJE

doktor medicine

TITULA

prof. dr. sc.

RADNO ISKUSTVO

04.2011 -

Pročelnik Kliničke jedinice za farmakogenomiku i individualizaciju terapije

Klinički bolnički centar Zagreb, 10 000 Zagreb, Kišpatičeva 12

www.kbc-zagreb.hr

Organizator i voditelj farmakogenetičkih ispitivanja u akreditiranom laboratoriju sa svrhom testiranja na genetičku predispoziciju za neočekivan-promijenjen odgovor na primijenjenu farmakoterapiju. Testiranja uključuju polimorfizme gena koji kodiraju metaboličke enzime faze I i II, transportnih proteina te receptora.

12.1997 - 03.2011

Voditelj laboratorija za farmakogenetiku

Klinički bolnički centar Zagreb, Kišpatičeva 12, 10 000 Zagreb

www.kbc-zagreb.hr

Organizacija rada laboratorija za farmakogenetiku i provođenje farmakogenetičkih testiranja

06.1987 - 11.1997

Voditelj laboratorija za stanične kulture u Centru za biomedicinska istraživanja

Klinički bolnički centar zagreb, Šalata 2, 10 000 Zagreb

Organiziranje rada u Laboratoriju za stanične kulture te provođenje testiranja aktivnosti i toksičnosti potencijalnih lijekova testovima in vitro

04.1983 - 05.1987

Analitičar u laboratoriju za stanične kulture

Klinički bolnički centar Zagreb,

10.1979 - 03.1983

specijalizant na Klinici za unutarnje bolesti

Klinički bolnički centar,

10.1977 - 09.1979

pripravnik

Klinički bolnički centar Zagreb,

**OBRAZOVANJE I
OSPOSOBLJAVANJE**

10.2000 - 10.2005	doktor biomedicinskih znanosti Medicinski fakultet Sveučilišta u Zagrebu
10.1978 - 07.1980	magistar medicinskih znanosti Medicinski fakultet Sveučilišta u Zagrebu
10.1972 - 07.1977	doktor medicine Medicinski fakultet Sveučilišta u Zagrebu

OSOBNJE VJEŠTINE

Ostali jezici	RAZUMIJEVANJE		GOVOR		PISANJE
	Slušanje	Čitanje	Govorna interakcija	Govorna produkcija	
engleski	C1/2: Iskusni korisnik	C1/2: Iskusni korisnik	B1/2: Samostalni korisnik	B1/2: Samostalni korisnik	B1/2: Samostalni korisnik

**Organizacijske /
rukovoditeljske vještine**

Iskustvo u organizaciji rada i rukovođenju laboratorijem a trenutno organizacijom rada i upravljanje poslovima u Kliničkoj jedinici.
Organizirala tečajeve trajnog usavršavanja i simpozij:
2013 "Farmakogenomika i farmakovigilancija
- sprječavanje nuspojava u individualizaciji terapije - upute i smjernice"
2013 Suorganizator simpozija "GoldenHelix Pharmacogenomics Day", Zagreb

Poslovne vještine

Računalne vještine Microsoft Windows, Office

Vozačka dozvola B kategorija

DODATNE INFORMACIJE

Izdanja

Važnije publikacije:

1. Supe S, Božina N, Matijević V, Bazina A, Mišmaš A, Ljevak J, Alvir D, Habek M, Poljaković Z. Prevalence of genetic polymorphisms of CYP2C9 and VKORC1 - implications for warfarin management and outcome in Croatian patients with acute stroke. *J Neurol Sci* 2014;343(1-2):30-5.
2. Bilic P, Jukic V, Vilibic M, Savic A, Bozina N. Treatment-resistant schizophrenia and DAT and SERT polymorphisms. *Gene* 2014;543(1):125-32.
3. Kao AC, Rojnic Kuzman M, Tiwari AK, Zivkovic MV, Chowdhury NI, Medved V, Kekin I, Zai CC, Lieberman JA, Meltzer HY, Bozina T, Bozina N, Kennedy JL, Sertic J, Müller DJ. Methylenetetrahydrofolate reductase gene variants and antipsychotic-induced weight gain and metabolic disturbances. *J Psychiatr Res* 2014;54:36-42.
4. Trkulja V, Lalić Z, Nađ-Škegro S, Lebo A, Granić P, Lovrić M, Pasini J, Božina N. Effect of cyclosporine on steady-state pharmacokinetics of mycophenolic acid (MPA) in renal transplant recipients is not affected by the MPA formulation: analysis based on therapeutic drug monitoring. *Ther Drug Monit* 2014;36(4):456-64.
5. Zivković M, Mihaljević-Peles A, Bozina N, Sagud M, Nikolac-Perkovic M, Vuksan-Cusa B, Muck-Seler D. The association study of polymorphisms in DAT, DRD2, and COMT genes and acute extrapyramidal adverse effects in male schizophrenic patients treated with haloperidol. *J Clin Psychopharmacol*. 2013 Oct;33(5):593-9.
6. Mirošević Skvrce N, Božina N, Zibar L, Barišić I, Pejnović L, Macolic Sarinic V. CYP2C9 and ABCG2 polymorphisms as risk factors for developing adverse drug reactions in renal transplant patients taking fluvastatin: a case-control study. *Pharmacogenomics*. 2013 Sep;14(12):1419-31.
7. Brinar M, Cukovic-Cavka S, Bozina N, Ravic KG, Markos P, Ladic A, Cota M, Krznicaric Z, Vucelic B. MDR1 polymorphisms are associated with inflammatory bowel disease in a cohort of Croatian IBD patients. *BMC Gastroenterol*. 2013 Mar27;13:57.
8. Sporis D, Bozina N, Basić S, Lovrić M, Babić T, Susak I, Marković I. Lack of association between polymorphism in ABCC2 gene and response to antiepileptic drug treatment in Croatian patients with epilepsy. *Coll Antropol*. 2013 Mar;37(1):41-5.
9. Marusic S, Lisicic A, Horvatic I, Bacic-Vrca V, Bozina N. Atorvastatin-related rhabdomyolysis and acute renal failure in a genetically predisposed patient with potential drug-drug interaction. *Int J Clin Pharm*. 2012 Dec;34(6):825-7.
10. Sarac H, Markeljjevic J, Mokrovic G, Erdeljic V, Bozina N, Cicin-Sain L. Platelet serotonin in primary Sjögren's syndrome: level and relation with disease activity. *J Neuroimmunol*. 2012 Oct 15;251(1-2):87-9.
11. Lovrić M, Božina N, Hajnšek S, Kuzman MR, Sporiš D, Lalić Z, Božina T, Granić P. Association between lamotrigine concentrations and ABCB1 polymorphisms in patients with epilepsy. *Ther Drug Monit*. 2012 Oct;34(5):518-25.
12. Božina N, Jovanović N, Podlesek A, Rojnic Kuzman M, Kudumija Slijepčević M, Roguljić A, Dimitrović A, Božina T, Lovrić J, Ljubić H, Medved V. Suicide ideators and attempters with schizophrenia--the role of 5-HTTLPR, rs25531, and 5-HTT VNTR Intron 2 variants. *J Psychiatr Res*. 2012 Jun;46(6):767-73.
13. Karmelić I, Lovrić J, Božina T, Ljubić H, Vogrinc Ž, Božina N, Sertić J. Adiponectin level and gene variability are obesity and metabolic syndrome markers in a young population. *Arch Med Res*. 2012 Feb;43(2):145-53.
14. Sporiš D, Bašić S, Božina N, Babić T, Hajnšek S, Sertić J, et al. ABCB1 gene variants as predictors of multidrug-resistant epilepsy in Croatian population. *Neurologia Croatica*. 2011;60(2):63-71.
15. Mirošević Skvrce N, Macolic Sarinic V, Mucalo I, Krnic D, Bozina N, Tomic S. Adverse drug reactions caused by drug-drug interactions reported to Croatian Agency for Medicinal Products and Medical Devices: a retrospective observational study. *Croat Med J*. 2011 Oct 15;52(5):604-14.
16. Kuzman MR, Medved V, Bozina N, Grubišić J, Jovanovic N, Sertic J. Association study of MDR1 and 5-HT2C genetic polymorphisms and antipsychotic-induced metabolic disturbances in female patients with schizophrenia. *Pharmacogenomics J*. 2011 Feb;11(1):35-44.
17. Jovanović N, Božina N, Lovrić M, Medved V, Jakovljević M, Peleš AM. The role of CYP2D6 and ABCB1 pharmacogenetics in drug-naïve patients with first-episode schizophrenia treated with risperidone. *Eur J Clin Pharmacol*. 2010 Nov;66(11):1109-17.
18. Skvrce NM, Bozina N, Sarinić VM, Tomić S. Adverse drug reactions of hydroxymethylglutaryl-CoA reductase inhibitors reported to agency for medicinal products and medical devices]. *Lijec Vjesn*. 2010 Sep-Oct;132(9-10):277-82.
19. Mihaljević-Peles A, Sagud M, Bozina N, Zivković M, Jovanović N. Pharmacogenetics and antipsychotics in the light of personalized pharmacotherapy. *Psychiatr Danub*. 2010 Jun;22(2):335-7.
20. Bozina N. The pharmacogenetics of warfarin in clinical practice. *Biochemia Medica*. 2010;20(1):33-44.
21. Marusic S, Gojo-Tomic N, Franic M, Bozina N. Therapeutic efficacy of acenocoumarol in a warfarin-resistant patient with deep venous thrombosis: a case

- report. *Eur J Clin Pharmacol*. 2009 Dec;65(12):1265-6.
22. Mihaljević-Peles A, Sagud M, Božina N, Zivković M, Jovanović N. Pharmacogenetics and interactions of antidepressants in the treatment of comorbid illness. *Psychiatr Danub*. 2009 Sep;21(3):399-400.
23. Božina N, Bradamante V, Lovrić M. Genetic polymorphism of metabolic enzymes P450 (CYP) as a susceptibility factor for drug response, toxicity, and cancer risk. *Arh Hig Rada Toksikol*. 2009 Jun;60(2):217-42.
24. Božina N, Jovanović N, Lovrić M, Medved V. Clinical significance of a CYP2D6 poor metabolizer--a patient with schizophrenia on risperidone treatment. *Ther Drug Monit*. 2008 Dec;30(6):748-51.
25. Kuzman MR, Medved V, Božina N, Hotujac L, Sain I, Bilusic H. The influence of 5-HT(2C) and MDR1 genetic polymorphisms on antipsychotic-induced weight gain in female schizophrenic patients. *Psychiatry Res*. 2008 Sep 30;160(3):308-15.
26. Mihaljević-Peles A, Sagud M, Božina N, Zivković M. Pharmacogenetics and antidepressant treatment in integrative psychiatry perspective. *Psychiatr Danub*. 2008 Sep;20(3):399-401.
27. Basic S, Hajsek S, Božina N, Filipčić I, Sporis D, Mislov D, Posavec A. The influence of C3435T polymorphism of ABCB1 gene on penetration of Phenobarbital across the blood-brain barrier in patients with generalized epilepsy. *Seizure*. 2008 Sep;17(6):524-30.
28. Mihaljević Peles A, Božina N, Sagud M, Rojnic Kuzman M, Lovric M. MDR1 gene polymorphism: therapeutic response to paroxetine among patients with major depression. *Prog Neuropsychopharmacol Biol Psychiatry*. 2008 Aug 1;32(6):1439-44.
29. Božina N, Kuzman MR, Medved V, Jovanovic N, Sertić J, Hotujac L. Associations between MDR1 gene polymorphisms and schizophrenia and therapeutic response to olanzapine in female schizophrenic patients. *J Psychiatr Res*. 2008 Jan;42(2):89-97.
30. Božina N, Peles AM, Sagud M, Bilusic H, Jakovljević M. Association study of paroxetine therapeutic response with SERT gene polymorphisms in patients with major depressive disorder. *World J Biol Psychiatry*. 2008;9(3):190-7.
31. Božina N, Medved V, Kuzman MR, Sain I, Sertić J. Association study of olanzapine-induced weight gain and therapeutic response with SERT gene polymorphisms in female schizophrenic patients. *J Psychopharmacol*. 2007 Sep;21(7):728-34.
32. Mihaljević-Peles A, Božina N, Sagud M. Pharmacogenetics in modern psychiatry. *Psychiatr Danub*. 2007 Sep;19(3):231-3.
33. Sertić J, Slavicek J, Božina N, Malenica B, Kes P, Reiner Z. Cytokines and growth factors in mostly atherosclerotic patients on haemodialysis determined by biochip array technology. *Clin Chem Lab Med*. 2007;45(10):1347-52.
34. Božina N. Interactions of antiepileptic and psychotropic drugs - pharmacogenetics of CYP enzymes and P-glycoprotein transporter. *Paediatrica Croatica*. 2006;50(2):41-8.
35. Božina N, Mihaljević-Peles A, Sagud M, Jakovljević M, Sertić J. Serotonin transporter polymorphism in Croatian patients with major depressive disorder. *Psychiatr Danub*. 2006 Jun;18(1-2):83-9.
36. Božina N, Granić P, Hajnšek S, Lalić Z, Bašić S, Lovrić M, et al. Genetic polymorphisms of CYP2C9, CYP2C19 and MDR1 genes and their effect on phenytoin disposition. *Period Biol*. 2005;107(2):183-7.
37. Hajnšek S, Bašić S, Poljaković Z, Sporiš D, Božina N. The effect of MDR1 gene C3435T polymorphism on pharmacotherapeutic efficacy in epilepsy. *Neurologia Croatica*. 2004;53(3-4):69-78.
38. Božina N. Role of pharmacogenomics in pharmacotherapy - from functional genomics to rational therapy. *Pharmaca*. 2004;42(2):71-86.
39. Skaza A, Grsković B, Pleština S, Božina N, Potocnik M, Waugh MA. Prevalence of asymptomatic chlamydial urethritis in military recruits in the Celje region, Slovenia. *Int J STD AIDS*. 2003 Nov;14(11):765-9.
40. Božina N, Granić P, Lalić Z, Tramišak I, Lovrić M, Stavljenić-Rukavina A. Genetic polymorphisms of cytochromes P450: CYP2C9, CYP2C19, and CYP2D6 in Croatian population. *Croat Med J*. 2003 Aug;44(4):425-8.
41. Božina N, Tramišak I, Granić P, Puljević D, Stavljenić-Rukavina A. Prevalence of ultraextensive drug metabolizers in Croatian population--long-PCR based detection of amplified CYP2D6 gene. *Lijec Vjesn*. 2002 Mar-Apr;124(3-4):63-6.
42. Božina N, Tramišak I, Medved V, Mihaljević-Peleš A, Granić P, Stavljenić-Rukavina A. CYP2D6 genotype and psychotropic drug-induced adverse effects. *Period Biol*. 2001;103(4):309-14.

Poglavlja u knjizi-priručniku:

Božina N. Farmakogenomika-genski polimorfizam i primjena lijekova. U: Francetić I, Vitezić D. ur. Osnove kliničke farmakologije. Zagreb: Medicinska naklada, 2007:193-204.

Božina N. Farmakogenomika. U: Sertić J. ur. Klinička kemija i molekularna

dijagnostika. Medicinska naklada, 2007: 302-310.

Božina N. Farmakogenomika U: Vrhovac B, Jakšić B, Reiner Ž, Vucelić B ur. Interna Medicina. Zagreb: Naklada Ljevak, 2008:222-224.

Božina N. Farmakogenetika. U: Bulić-Jakuš F i Barišić I., ur. Emeryjeve Osnove medicinske genetike. Zagreb: Medicinska Naklada, 2011;185-191.

Božina N. Biotransformacija lijeka. Božina N. i Šalković-Petrišić M. Antidepresivi. Božina N. i Bradamante V. Dermatološka farmakologija. U: Trkulja V. Klarica M. Šalković-Petrišić ur. Temeljna i klinička farmakologija. Medicinska Naklada, 2011; 53-66; 509-530; 1047-1066.

Božina N, Pejnović L. Osnove farmakogenomike. U: Božina N, Macolić-Šarinić V (ur.). Farmakogenomika i farmakovigilancija - sprječavanje nuspojava u individualizaciji terapije – upute i smjernice. Zagreb: Medicinska naklada; 2013:1-22.

Čuković-Čavka S, Božina N. Farmakogenomika i upalne bolesti crijeva. U: Božina N, Macolić-Šarinić V (ur.). Farmakogenomika i farmakovigilancija - sprječavanje nuspojava u individualizaciji terapije – upute i smjernice. Zagreb: Medicinska naklada; 2013:49-58.

Božina N, Šimić I, Bradamante V. Interakcije lijekova - načela i primjeri kliničkih posljedica. U: Božina N, Macolić-Šarinić V (ur.). Farmakogenomika i farmakovigilancija - sprječavanje nuspojava u individualizaciji terapije – upute i smjernice. Zagreb: Medicinska naklada; 2013:113-126.

Božina N. Farmakogenomika-genski polimorfizam i primjena lijekova. U: Francetić I. Vitezić D.ur. Klinička farmakologija. Zagreb: Medicinska naklada, 2014:247-263.

Projekti

2013- Voditelj projekta: "Farmakogenomika i farmakovigilancija - sprečavanje nuspojava u individualizaciji terapije".

Suradnja sa Sveučilištem u Würzburgu na projektu "Molecular Basis of Neuropsychiatric Disorders", podprojekt "Molecular Mechanisms of Posttraumatic Stress Disorder", financiran od Deutscher Akademischer Austauschdienst (DAAD), Stability Pact for South Eastern Europe.

Suradnik na projektu Sveučilišta: "Farmakogenomko ispitivanje u djece s idiopatskim nefrotskim sindromom" (voditelj prof.dr.sc. D. Milošević)

Suradnik na projektima MZOS: od 2006. „Funkcijska genomika i proteomika rizičnih čimbenika ateroskleroze“ (voditelj prof.dr.sc. J.Sertić); „Farmakogenetska varijabilnost u psihijatrijskih bolesnika“ (voditelj prof.dr.sc. A. Mihaljević Peleš); "Upalne bolesti crijeva" (voditelj prof.dr.sc. B. Vucelić)

2002-2006 "Molekularna osnova aterogeneze voditelj prof.dr.sc. A. Stavljenić Rukavina)

Konferencije

Sudjelovala kao pozvani predavač na više konferencija i simpozija s temama farmakologija i toksikologija, sigurnost primjene lijeka, farmakogenomika

Priznanja i nagrade

Nagrade na simpozijima:

2013. Falk Symposium, London: Cota M, Cukovic-Cavka S, Bozina N, Brinar M, Crncevic Urek M, Turk N, Krznic Z, Vucelic B. "Inosine Triphosphate Pyrophosphatase And Xanthine Oxidase Gene Variability in Croatian Inflammatory Bowel Disease Patients"

2012. 2nd EFCC-UEMS Congress "Laboratory Medicine at the Clinical Interface", Mirošević Skvrce N, Božina N, Pejnović L, Barišić I, Zibar L, Macolić-Šarinić V. "ABCG2 Gene Variant And Fluvastatin Adverse Drug Reactions in Renal Transplant Recipients"

2012. Deveti psihijatrijski dani: Vlatkovic S, Zivkovic M, Mihaljevic-Peles A, Sagud M, Bozina N. Pisa Syndrome And Bipolar Affective Disorder.

2006. XIV World Congress on Psychiatric Genetics: Božina N, Mihaljević-Peleš A, Šagud M, Jakovljević M, Sertić J. "Serotonin Transporter Polymorphism And Paroxetine Drug Response in Major Depression Disorder"

2001. III Hrvatski kongres farmakologije: Božina N, Tramišak I, Medved V, Mihaljević-Peleš A, Granić P, Stavljenić-Rukavina A. "CYP2D6 Genotype And Psychotropic Drug-Induced Adverse Effects".

Članstva

Hrvatsko društvo farmakologa
Hrvatsko društvo za humanu genetiku
Hrvatsko društvo za biologijsku psihijatriju
International Association of therapeutic drug monitoring and clinical toxicology
European Society of Pharmacogenomics and Theranostics
European Society of Human Genetics
Hrvatski predstavnik u European Medicines Agency (EMA) Scientific Committee
and working party meetings, European Network of Centre for
Pharmacoepidemiology and Pharmacovigilance (ENCePP)