Matea Nikolac Perković

Education:

2010 – 2015	PhD Studies in Molecular Biosciences, University of Osijek, Osijek
2002 – 2008	Faculty of Natural Sciences, University of Zagreb, Zagreb; Title of qualification: MSc, molecular biologist
1998 – 2002	"2. Opća gimnazija" high school, Zagreb; Title of qualification: High school graduate

Employment:

2009 – present	Rudjer Boskovic Institute, Zagreb; Position: Research assistant, PhD student; Work field: Molecular psychiatry

Professional Memberships:

2010-	Member, Croatian Pharmacological Society
2010-	Member, The Federation of European Pharmacological Societies
2010-	Member, The International Union of Basic and Clinical Pharmacology
2011-	Member, Croatian Society for Neuroscience
2011-	Member, International Brain Research Organization
2011-	Member, Federation of European Neuroscience Societies

Honors:

National Science Award of the Republic of Croatia-Annual Award for Junior Researchers for 2013 in the field of Biomedicine

The annual award of the society of university teachers, scholars and other scientists – Zagreb for young scientists and artists for 2013

Contribution to Science:

Most of my scientific work is devoted to the study of molecular basis of various neurodegenerative, neuropsychiatric and neurodevelopmental disorders. I participated in the research of the role of peripheral biological indicators (platelet monoamine oxidase type B, platelet serotonin, N-glycans attached to immunoglobulin G (IgG) and plasma N-glycans) in different psychiatric disorders accompanied by specific behavioral and psychological symptoms. Our results showed that platelets can be used as a peripheral model for studying biomarkers related to various psychopathological conditions. I also participated in a study evaluating the association between IgG glycome and body mass index (BMI). This study indicated the association of BMI and changes in IgG galactosylation. The analysis of plasma glycans in attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders revealed that ADHD is associated with increased antennary fucosylation of biantennary glycans and decreased levels of some complex glycans with three or four antennas. The design of this study prevented any functional conclusions about the observed associations, but specific differences in glycosylation appears to be strongly associated with ADHD and warrants further studies in this direction.

Nikolac Perkovic M, Pucic Bakovic M, Kristic J, Novokmet M, Huffman JE, Vitart V, Hayward C, Rudan I, Wilson JF, Campbell H, Polašek O, Lauc G, Pivac N (2013) The association between galactosylation of immunoglobulin G and body mass index. Prog Neuropsychopharmacol Biol Psychiatry 48: 20-25.

Nenadic-Sviglin K, Nedic G, **Nikolac M**, Kozaric-Kovacic D, Stipcevic T, Muck-Seler D, Pivac N (2011) Suicide attempts, comorbid depression and platelet serotonin in alcohol dependence. Alcohol 45: 209-216.

Nenadic Sviglin K, Nedic G, **Nikolac M**, Mustapic M, Muck-Seler D, Borovecki F, Pivac N (2011) Insomnia, platelet serotonin and platelet monoamine oxidase in chronic alcoholism. Neurosci lett 500: 172-176.

Pivac N, Knezevic A, Gornik O, Pucic M, Igl W, Peeters H, Crepel A, Steyaert J, Novokmet M, Redzic I, **Nikolac M**, Novkovic Hercigonja V, Dodig Curkovic K, Curkovic M, Nedic G, Muck-Seler D, Borovecki F, Rudan I, Lauc G (2011) Human plasma glycome in attention-deficit hyperactivity disorder and autism spectrum disorders. Mol Cell proteomics 10 (2011): 1-7.

A large part of the research in which I participated refers to the study of various polymorphisms in genes involved in dopaminergic neurotransmission and gene coding for brain-derived neurotrophic factor (BDNF) with the purpose of identifying risk alleles and genotypes which are associated with specific psychopathological disorders and their endophenotypes.
Several of these studies have focused on common neurodevelopmental disorders and weight problems in children and they have yield results that contribute to the understanding of the role of genes encoding COMT and dopamine receptor D4 in ADHD or specific symptoms of ADHD (hyperactivity, impulsivity and inattention). They have also confirmed the major role of BDNF in energy metabolism, food regulation and BMI.

Nikolac Perkovic M, Kiive E, Nedic Erjavec G, Veidebaum T, Curkovic M, Dodig-Curkovic K, Muck-Seler D, Harro J, Pivac N (2013) The association between the catechol-O-methyltransferase Val108/158Met polymorphism and hyperactive–impulsive and inattentive symptoms in youth. Psychopharmacology 230: 69-76.

Nikolac Perkovic M, Nedic Erjavec G, Kocijan Hercigonja D, Hranilovic D, Curkovic M, Stefulj J, Dodig Curkovic K, Muck-Seler D, Pivac N (2013) Association between the polymorphisms of the selected genes encoding dopaminergic system with ADHD and autism. Psychiatry Res 215: 260-261.

Skledar M, **Nikolac M**, Dodig-Curkovic K, Curkovic M, Borovecki F, Pivac N (2012) Association between brain-derived neurotrophic factor Val66Met and obesity in children and adolescents. Prog Neuropsychopharmacol Biol Psychiatry 36: 136-140.

My research interest also refers to the study of addictive behavior, namely alcoholism. Publications in which we deal with this issue have recognized that investigated allelic variation in the COMT gene is associated with specific endophenotypes of alcohol dependence while this is not the case for selected functional allelic variation in the BDNF gene. These studies identify risk alleles and genotypes that might be used as an independent biomarker of suicidal behavior across different psychopathologies.

Nedic Erjavec G, Nenadic Sviglin K, **Nikolac Perkovic M**, Muck-Seler D, Jovanovic T, Pivac N (2014) Association of gene polymorphisms encoding dopaminergic system components and platelet MAO-B activity with alcohol dependence and alcohol dependence-related phenotypes. Prog Neuropsychopharmacol Biol Psychiatry 54:321-7.

Nedic G, **Nikolac Perkovic M,** Nenadic Sviglin K, Muck-Seler D, Borovecki F, Pivac N (2013) Brain-derived neurotrophic factor Val66Met polymorphism and alcohol-related phenotypes. Prog Neuropsychopharmacol Biol Psychiatry 40: 193-198.

Nedic G, **Nikolac M,** Nenadic Sviglin K, Muck-Seler D, Borovecki F, Pivac N (2011) Association study of a functional catechol-O-methyltransferase (COMT) Val108/158Met polymorphism and suicide attempts in patients with alcohol dependence. Int J Neuropsychopharmacol 14: 377-388.

One of the recent research fields that has attracted my attention is focused on trying to identify risk genotypes / alleles and peripheral biochemical markers which could predict therapeutic response and the risk of developing negative side effects to medical treatment in schizophrenia. The main idea of this research is to help in establishing the best therapy for every individual patient which could slow down the development of the disease and provide better quality of life.

Nikolac Perkovic M, **Nedic Erjavec G,** Zivkovic M, Sagud M, Uzun S, Mihaljevic-Peles A, Kozumplik O, Muck-Seler D, Pivac N (2014) Association between the brain-derived neurotrophic factor Val66Met polymorphism and therapeutic response to olanzapine in schizophrenia patients. Psychopharmacology 231: 3757-64

Zivkovic M, Mihaljevic-Peles A, Bozina N, Sagud M, **Nikolac Perkovic M**, Vuksan-Cusa B, Muck-Seler D (2013) The Association Study of Polymorphisms in DAT, DRD2, and COMT Genes and Acute Extrapyramidal

Adverse Effects in Male Schizophrenic Patients Treated With Haloperidol. Journal of clinical psychopharmacology 33: 593-599.

Sagud M, **Nikolac M**, Mihaljevic-Peles A, Nedic G, Vuksan Cusa B, Mustapic M, Jakovljevic M, Muck-Seler D, Pivac N (2012) The lack of effect of ziprasidone on platelet serotonin concentration in schizophrenic patients. Psychopharmacology 219: 1179-1181.

Complete List of Published Work in PubMed:

http://www.ncbi.nlm.nih.gov/pubmed/?term=nikolac+m
http://www.ncbi.nlm.nih.gov/pubmed/?term=nikolac+perkovic+m

Complete List of Published Work in Croatian Scientific Bibliography:

https://bib.irb.hr/lista-radova?autor=315511

Google scholar

http://scholar.google.com/citations?user=grN_wdkAAAAJ&hl=en

Research Support:

Ongoing Research Support

2015-2017 „Multidisciplinary metrics for soldier resilience pediction and training“, NATO Science for Peace and Security Programme: PIs: Kresimir Cosic and Omer Bonne; co-director Nela Pivac

Role: Co-Investigator

The goal of this project is to identify multidisciplinary risk indicators which could be used as predictors of soldiers' resilience/vulnerability. The prospective identification of multidisciplinary indicators of resilience/vulnerability may allow the discovery of dominant multidimensional and multimodal predictors of stress resilience/vulnerability.

2014-2015 „The role of 5-HT6 receptors in Alzheimer's disease" (funding source: Croatian Ministry of Science, Education and Sports; PIs: Suzana Uzun and Zvezdan Pirtovsek); Croatian-Slovenian bilateral project

Role: Co-Investigator

The goal of this project is to examine the relationship between the two genetic polymorphisms (rs1805054 and rs3790756) of 5-HT6 receptor and behavioral and psychological symptoms of dementia in patients with Alzheimer's disease.

2014-2016 **„**The association between stress, genetic variants of the catechol-O-methyltransferase (COMT) and mu opioid receptor gene (OPRM1) polymorphisms and tobacco smoking in patients with schizophrenia.“; collaborative project among University of Michigan – USA, Rudjer Boskovic Institute, Croatia and University Psychiatric Hospital Vrapce, Zagreb, Croatia (PIs: Nela Pivac and Edward F Domino)

Role: Co-Investigator

The goal of this project is to examine the relationship between COMT rs4680 and OPRM1 rs1977791 genetic variants, the level of stress (determined through saliva cortisol level and heart beats rate), and smoking status in patients diagnosed with schizophrenia

2011-2014 „Detection and tracking of biological markers for early therapeutic intervention in sporadic Alzheimer's disease“ project (funding source: Croatian Science Foundation; PI: Goran Simic)

Role: Co-Investigator

The goal of this project is to determine the diagnostic accuracy of potentially highly useful biological markers for discrimination among subjects with early behavioral and psychological symptoms of dementia caused by Alzheimer's disease, non-demented control subjects, and patients with other primary causes of dementia.

2011-2015 „Structure-based drug design for diagnosis and treatment of neurological diseases: dissecting and modulating complex function in the monoaminergic systems of the brain“ project (funding source: European Cooperation in Science and Technology (COST), Action CM1103; PI: Rona Ramsay, member for Croatia: Nela Pivac

Role: Co-Investigator

The goal of this project is to facilitate the cross-disciplinary interaction for discovery of promiscuous drugs for diagnosis and treatment of complex brain diseases, with focus on monoaminergic systems.

Completed Research Support

2009-2010 „Genetic factors as markers of suicide” (funding source: Croatian Ministry of Science, Education and Sports; PIs: Nela Pivac and Petar Pregelj); Croatian-Slovenian bilateral project

Role: Co-Investigator

The goal of this project was to investigate the role of COMT rs4680 and BDNF rs6265 polymorphisms in completed suicide.

2007-2014 „Molecular basis and treatment of psychiatric and stress related dissorders“ (funding source: Croatian Ministry of Science, Education and Sports; PI: Nela Pivac)

Role: Co-Investigator

The goal of this project was to determine biological markers involved in development and treatment of psychiatric, stress-related, behavioral, comorbid cognitive disorders and addictions.