

# **Molecular Biology**

<b>RECOOP HST Research Activity Inventory</b>	
Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.	
<b>Organization</b>	Institute of Molecular Biology and Genetics
<b>Area of the Research</b>	Molecular Biology, Combinatorial Chemistry
<b>Title of the Research Activity</b>	The design of inhibitors of MAPK signaling pathway TNFR/TGFR-ASK1-MKK4/7-JNK
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>
Department of Combinatorial Chemistry of Institute of Molecular Biology and Genetics 150 Zabolotno St, 03143 Kyiv, Ukraine	Name: Sergiy M. Yarmoluk
	Title: Prof., Dr. Sci
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	Fax: +380445222458
	E-mail: sergiy@yarmoluk.org.ua
<b>Abstract</b>	Maximum 500 characters
Protein kinases have now become the second most important group of drug targets. We propose the development of inhibitors of kinases ASK1 and JNK3. The virtual screening will be used to analyze in-house 92,000 organic compounds library in order to identify possible inhibitors. Once new hits will be identified by virtual screening, they will be tested in biochemical assays to evaluate their ability to inhibit the kinases. According to the results coming from biological assays, a rational design of a second round will be performed followed by the synthesis of the newly designed compounds.	
<b>Methods used</b>	Maximum 300 characters
Organic synthesis, combinatorial synthesis, NMR analysis, receptor-based virtual screening, in-vitro screening, molecular dynamics simulation.	
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference
<i>Golub AG, Yakovenko OY, Bdzhola VG, Sapelkin VM, Zien P, Yarmoluk SM.</i> Evaluation of 3-Carboxy-4(1H)-quinolones as Inhibitors of Human Protein Kinase CK2. <i>J Med Chem.</i> 2006; 49(22), 6443-50. <b>(4.926)</b>	
<i>Prykhod'ko A.O., Yakovenko O.Ya., Golub A.G., Bdzhola V. G., Yarmoluk S.M.</i> Evaluation of 4H-4-chromenone derivatives as inhibitors of protein kinase CK2 // <i>Biopolymers and Cell</i> , 2005. – 21, № 3, 287-292.	
<i>Sapelkin V., Yakovenko O., Golub A., Bdzhola V., Yarmoluk S.</i> Search for protein kinase CK2 inhibitors among 3 carbetoxy 4 aminoquinoline derivatives // <i>Ukrainica Bioorganica Acta.</i> 2005. Vol. 2, № 1, P. 28-32.	
<b>Related Inventions Disclosures and Patents</b>	
Pat. UA68984 A, C07D215/00, 2004-08-16. Application of 4-substituted 3-carboxyquinolines as protein kinase CK2 inhibitors	
Pat. UA69165 A, C07D215/00, 2004-08-16. Application of 4,5,6,7-tetrahalogeno-1,3-isoindolinediones as protein kinase CK2 inhibitors.	

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Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.	
<b>Organization</b>	Institute of Cell Biology, NAS of Ukraine, Lviv, Ukraine
<b>Title of the Research Activity</b>	Anticancer enzymotherapies, signaling mechanisms in tumor cells as drug targets, autophagic degradation in eukaryotes, organelle homeostasis, heterologous protein expression in yeasts.
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>
Department of Cell Signaling (DCS) Institute of Cell Biology Drahomanov Street 14/16 79005, Lviv, Ukraine	Name: Oleh Stasyk
	Title: Dr.
	Tel: 380-32-2612146
	Fax: 380-32-2612148
	E-mail: <a href="mailto:stasyk@cellbiol.lviv.ua">stasyk@cellbiol.lviv.ua</a> ,
<b>Abstract</b>	Maximum 500 characters
DCS works in the fields of molecular mechanisms of cell signaling, autophagic degradation and organelle homeostasis in higher eukaryotes and yeasts, development of enzymatic anticancer therapies based on nutrient deprivation, utilization of yeasts as expression platform for recombinant proteins and as a models for drug design. Unique feature of ICB-CS is combination of expertise and methodologies on yeasts and human cells that allows fast and efficient transfer and validation of the knowledge on signaling pathways between different model organisms.	
<b>Methods used</b>	Maximum 300 characters
Various molecular genetic manipulations with yeast and cultured animal cells, PCR, Northern, Southern and Western blotting, expression and purification of recombinant proteins, ultrastructural studies in cell biology, biochemical methods, etc. .	
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference
1. Stasyk OV, Stasyk OG, Komduur J, Veenhuis M, Cregg JM, Sibirny AA. (2004) A hexose transporter homologue controls glucose repression in the methylotrophic yeast <i>Hansenula polymorpha</i> . <i>J. Biol. Chem.</i> , v. 279, p. 8116-25. <b>IF = 6.355</b> (2004).	
2. Borthwick EB, Korobko IV, Luke C, Drel VR, Fedyshyn YY, Ninkina N, Drobot LB, Buchman VL. (2004) Multiple domains of Ruk/CIN85/SETA/CD2BP3 are involved in interaction with p85alpha regulatory subunit of PI 3-kinase. <i>J Mol Biol.</i> 343(4):1135-46. <b>IF = 5.542</b> (2004).	
3. Krasovska OS, Stasyk OG, Nahorny VO, Stasyk OV, Granovski N, Kordium VA, Vozianov OF & Sibirny AA (2007) Glucose-induced production of recombinant proteins in <i>Hansenula polymorpha</i> mutants deficient in catabolite repression. <i>Biotechnol Bioeng</i> (in press). (available online; PMID: 17163508). <b>IF = 2.216</b> (2004).	
<b>Related Inventions Disclosures and Patents</b>	
<b>Patents:</b> No	
<b>Disclosure:</b> No	

<b>RECOOP HST Research Activity Inventory</b>					
Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.					
<b>Organization</b>	Palladin Institute of Biochemistry NAS of Ukraine				
<b>Area of the Research</b>	BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH: Molecular biology; Cell biology, Membrane transporters. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES: Metabolic - <u>diabetes</u> and obesity; Chronic diseases: gastrointestinal, musculoskeletal, <u>neurodegenerative</u>				
<b>Title of the Research Activity</b>	Investigation of the molecular mechanisms of vitamins A, E, B <sub>1</sub> , PP participation in maintenance of functioning and vital activity of cells in norm and under certain pathologies.				
<b>Department (complete address)</b>		<b>Principal Investigator or Head of the Research Group</b>			
9, Leontovicha str., Kyiv, 01601, Ukraine O.V. Palladin Institute of Biochemistry NAS Ukraine, Coenzymes Biochemistry Department. Head of Coenzymes Biochemistry Department, Doc. Sci., Professor, corresponding member of NAS Ukraine Georgiy Donchenko		Name: Georgiy Donchenko			
		Title: Doc. Sci., Professor			
		Tel: 38 044 234-71-78			
		Fax: 38 044 279-63-65			
		E-mail: dongv@biochem.kiev.ua			
<b>Abstract</b>	Maximum 500 characters				
Study of molecular mechanisms of vitamins A, E, B <sub>1</sub> and PP, their coenzymes, metabolites and special protein-acceptors participation in regulation processes of a cellular cycle (in particular, apoptosis) is a general fundamental scientific problem on which decision the given project is directed.					
<b>Methods used</b>	Maximum 300 characters				
Biochemical, spectrophotometric, radioisotope, immunological methods, electrophoresis, immunoblotting, confocal laser scanning fluorescence microscopy would be used in researches.					
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference				
Chorny S.A., Parkhomenko Iu.M. Apoptosis activation in rat astrocyte cells caused by antagonists of thiamine. Biopolymers and cell (Biopolimery i kletka). 2006. 22 (4): P. 290-298;					
Petrova G.V., Донченко G.V. $\alpha$ -Tocopherol and its derivatives influence on apoptosis of rats' tymocytes, induced by actinomycin D. // Ukr. biochem. J. 2005. - 77, № 1. - P. 102-107;					
Tamara Kuchmerovska, Ihor Shymansky, Georgiy Donchenko et al. Poly -ADP-ribosylation enhancement in brain cells nuclei is associated with diabetic // Journal of Diabetes and Its Complications. 2004. - 18, N 4. - P.198-204.					
<b>Related Inventions Disclosures and Patents</b>					
Coenzymes Biochemistry Department has 41 Patent, and also 6 Ukraine Patents for metabolic medicine creation on the vitamin's base and other nature compounds have been obtained in last five years					
Planning grant application (please mark your selection with X)		FP7	<input checked="" type="checkbox"/>	NIH	<input checked="" type="checkbox"/>
Only participating in projects (please mark your selection with X)		FP7	<input checked="" type="checkbox"/>	NIH	<input checked="" type="checkbox"/>

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Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.					
<b>Organization</b>	Palladin Institute of Biochemistry NAS of Ukraine				
<b>Area of the Research</b>	Cardiovascular disease, diabetes and obesity				
<b>Title of the Research Activity</b>	The investigation of adhesion, growth and phenotypic properties of endothelial and vascular smooth muscle cells on immobilized hyaluronan and its low-molecular-weight fragments				
<b>Department (complete address)</b>	Molecular Immunology Department, Palladin Institute of Biochemistry 9, Leontovich str, 01601 Kyiv, Ukraine		<b>Principal Investigator or Head of the Research Group</b>		
			Name: Natalia Yevdokimova		
			Title: PhD		
			Tel: 380 44 234 33 54		
			Fax: 380 44 279 63 65		
			E-mail: berezan@mathber.carrier.kiev.ua		
<b>Abstract</b>	Maximum 500 characters				
In-stent restenosis involves the excessive deposition of high-molecular-weight hyaluronic acid (HA). HA is anti-angiogenic, whereas, its degradation products of specific size (o-HA) stimulate EC proliferation, migration and differentiation. In contrast, the proliferation and migration of VSMC are stimulated by HA, but inhibited by o-HA. Therefore, o-HA may promote the stent endothelialization due to the optimizing of EC behaviour and simultaneous inhibition of VSMC growth.					
<b>Methods used</b>	Maximum 300 characters				
HA fragmentation; EC and VSMC culturing with the determination of their growth characteristics; RT-PCR, Western blot, ELISA and whole cell ELISA for the determination of the expression and production of EC and VSMC markers.					
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference				
Yevdokimova N, Komisarenko S (2004) TGFbeta1 is involved in high glucose-induced accumulation of pericellular chondroitin sulphate in human endothelial cells. J Diabetes Complications 18, 1-9. (1.8).					
Yevdokimova N, Podpryatov S (2005) Hyaluronic acid production and CD44 expression in dermal fibroblasts of patients with NIDDM with and without chronic ulcers on the lower extremity. Wound Rep Reg 13, 181-188 (2.1)					
Yevdokimova N (2006) Elevated level of ambient glucose stimulates the synthesis of high-molecular weight hyaluronic acid by human mesangial cells. The involvement of TGFbeta1 and its activation by TSP-1. Acta Biochimica Polonica 53, 383-393. (2.3)					
<b>Related Inventions Disclosures and Patents</b>					
Planning grant application (please mark your selection with X)			FP7	X	NIH
Only participating in projects (please mark your selection with X)			FP7	X	NIH

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Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.				
<b>Organization</b>	Palladin Institute of Biochemistry NAS of Ukraine			
<b>Area of the Research</b>	Brain and spinal cord related diseases, Lipids and lipoproteins			
<b>Title of the Research Activity</b>	Multiple sclerosis: molecular mechanism and ways of treatment			
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>			
9, Leontovicha str., Kyiv, 01601, Ukraine O.V. Palladin Institute of Biochemistry NAS Ukraine, Coenzymes Biochemistry Department. Head of Coenzymes Biochemistry Department, Doc. Sci., Professor, corresponding member of NAS Ukraine Georgiy Donchenko	Name: Georgiy Donchenko			
	Title: Doc. Sci., Professor			
	Tel: 380 44 234-71-78			
	Fax: 380 44 279-63-65			
	E-mail: dongv@biochem.kiev.ua			
<b>Abstract</b>	Maximum 500 characters			
Investigation of intracellular metabolism impairments of nervous immune systems in development of neurological abnormalities. Assessing demyelination of structural elements of the central and peripheral nervous systems under conditions of the multiple sclerosis. These studies are aimed to develop an approach of complex prophylactic and correction of multiple sclerosis by combined metabolic action of the mixture of biologically active compounds, vitamins and coenzymes.				
<b>Methods used</b>	Maximum 300 characters			
Measurement of NAD and lactate dehydrogenase activity was performed by colorimetric assay. Cholesterol and phospholipids content were assessed by the thin layer chromatography.				
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference			
Pasichna E.P., Morozova R.P., Donchenko G.V., Chekhiv's'ka L.I. Redox-state of NAD pairs and activity of lactate dehydrogenase and NADase in guinea pig tissues at different stages of development of experimental allergic encephalomyelitis. Ukr. Biokhim. J. - 2004; 76(6): 88-94.				
<b>Related Inventions Disclosures and Patents</b>				
Patent A61K31/355, A61P3/00 UA (15.07.2005): "Method for Improvement of Intracellular Energetic Exchange of the Organism" Donchenko G.V., Kuzmenko I.V., Petukhov D.M., Klimenko K.P.				
Planning grant application (please mark your selection with X)	FP7	X	NIH	X
Only participating in projects (please mark your selection with X)	FP7	X	NIH	X

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Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.					
<b>Organization</b>	Palladin Institute of Biochemistry, National Academy of Sciences, Ukraine				
<b>Area of the Research</b>	Cell biology, membrane transporters				
<b>Title of the Research Activity</b>	Nerve signal transmission				
<b>Department (complete address)</b> Neurochemistry Leontovicha Str., 9, Kyiv 01601, Ukraine			<b>Principal Investigator or Head of the Research Group</b>		
			Name: Himmelreich N.		
			Title: Head of Laboratory		
			Tel: +38 044 2343254		
			Fax: +38 044 2796365		
			E-mail: ninahimm@biochem.kiev.ua		
<b>Abstract</b>	Maximum 500 characters				
Main goals are studies of neurotransmission process and its distortion by hypoxia. Two models are used: hypoxia evoked by hypergravity loading and perinatal hypoxia. The experiments are focused on: exocytotic process and fusion process as a step of exocytosis; transmembrane transport of excitatory and inhibitory neurotransmitters across the plasma and synaptic vesicle membranes; plasma, mitochondrial and synaptic vesicle membrane potentials; membrane cholesterol as a determinant of exocytotic and membrane neurotransmitter transporter activities; neurotransmitter transporters of non-neuronal tissues (blood platelets).					
<b>Methods used</b>	Maximum 300 characters				
In experiments are used: isolated nerve terminals, bilayer lipid membranes and cell-free system consisting from isolated synaptic vesicles and presynaptic membranes. Main techniques include correlative spectroscopy, radiolabeled neurotransmitters, fluorescent probes for monitoring exocytosis; plasma, mitochondrial and synaptic vesicle membrane potentials; fusion process.					
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference				
Tarasenko, A.S., Linetska, M.V., Storchak, L.G., Himmelreich, N.H., 2006. Effectiveness of extracellular lactate/pyruvate for sustaining synaptic vesicle proton gradient generation and vesicular accumulation of GABA. J. Neurochem. 99, 787-796.					
Tarasenko, A.S., Kostzhevskaya, O.G., Storchak, L.G., Linetska, M.V., Borisova, T.A., Himmelreich, N.H., 2005. Phenylarsine oxide is able to dissipate synaptic vesicle acidic pool. Neurochem. Int. 46, 541-550.					
Borisova, T.A., Himmelreich, N.H. Centrifuge-Induced Hypergravity: [ <sup>3</sup> H]GABA and L-[ <sup>14</sup> C]glutamate Uptake, Exocytosis and Efflux Mediated by High-Affinity, Sodium-Dependent Transporters. 2005. Adv.Space Res. 36, 1340-1345.					
<b>Related Inventions Disclosures and Patents</b>					
Planning grant application (please mark your selection with X)			FP7	NIH	X
Only participating in projects (please mark your selection with X)			FP7	NIH	X

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Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.	
<b>Organization</b>	Department of Immunology and Biotechnology Medical School
<b>Area of the Research</b>	BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH Molecular biology Cell biology 3D tissue and organ cultures DETECTION, DIAGNOSIS AND MONITORING Molecular diagnostics
<b>Title of the Research Activity</b>	Immunology, molecular biology, monoclonal antibody, tissue culture, laboratory diagnostics
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>
Department of Immunology and Biotechnology, Medical School  H-7624 Pécs, Szigeti út 12, Hungary	Name: Prof. Dr. NÉMETH, Péter
	Title: Prof. Dr.
	Tel: + 36 72 536288
	Fax: +36 72536289
	E-mail: <a href="mailto:peter.nemeth@aok.pte.hu">peter.nemeth@aok.pte.hu</a> <b>Web:</b> <a href="http://www.immbio.hu/">http://www.immbio.hu/</a>
<b>Abstract</b>	Maximum 500 characters
<b>Research area</b> <ol style="list-style-type: none"> <li>1 Production of monoclonal antibodies (mouse and rat) for research and diagnostics</li> <li>2 Epitope analysis of autoantibodies</li> <li>3 Development of lymphoid organs in transgenic and chimeric mice, and <i>in vitro</i> 3D systems.</li> <li>4 Role of glucocorticoids in the regulation of T-cell differentiation</li> <li>5 Investigation of innate immune system in invertebrates</li> </ol>	
<b>Human resources</b> research fellows (15) (CSc (3) [1 with habilitation], PhDs (4) [1 with habilitation], PhD students (5), resident (1), research associates (2)), laboratory analysts (2), technicians (4), administrative staff (1), maintenance staff (1)	
<b>Special instruments</b> Tissue culture and depository equipment, (laminar boxes, CO <sub>2</sub> -incubator and liquid N <sub>2</sub> -container), molecular biology instruments (PCR cyclers, electrophoresis apparatus, transilluminators, centrifuges) microscopes (inverted, with normal light and fluorescent modes, equipped with CCD camera and morphometry setup) FPLC chromatography, cryostat, ELISA processor and ELISA reader, biofermentor.	
<b>Products and services</b> <ul style="list-style-type: none"> <li>• Production of monoclonal antibodies (against hormones [insulin, hCG, TSH],</li> </ul>	

<p>hormone-receptors [GcR] cytokines [TNF], viruses [HBxAg, M13 phage] haptens, mammalian/mouse and invertebrate hemopoietic and other cells), development of hybridoma cell lines for research purposes.</p> <ul style="list-style-type: none"> <li>• Production of immunoglobulins (both poly- and monoclonal), purification, labeling (with fluorescent and biotin compounds) and quality control (by ELISA, flow cytometry or immunohistology).</li> <li>• Lentiviral gene expression, epitope phage display.</li> <li>• Autoantibody diagnostics with ELISA procedures</li> <li>• Determination of peripheral blood leukocyte subsets using flow cytometry.</li> </ul>	
<b>Methods used</b>	Maximum 300 characters
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference
<b>Related Inventions Disclosures and Patents</b>	Invention: Epitope Specific Diagnostic and Therapeutic Tool for Immune-related Diseases (Filled application)

<b>RECOOP HST Research Activity Inventory</b>	
Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.	
<b>Organization</b>	Department of Pharmacology and Pharmacotherapy Medical School, University of Pécs
<b>Area of the Research</b>	Enteric nervous system, bronchial tree, capsaicin-sensitive neurons, TRPV1 capsaicin receptor, putative analgesics and anti-inflammatory drugs, drugs that influence smooth muscle tone, neuropeptides, ATP, nitric oxide
<b>Title of the Research Activity</b>	Molecular Biology
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>
Department of Pharmacology and Pharmacotherapy Medical School, University of Pécs, H-7643 Pécs, Szigeti u. 12, Hungary	Name: Prof. Dr. BARTHÓ, Loránd
	Title: Prof. Dr
	Tel: +36 72 536001 ext: 1607
	Fax: +36 72 536218
	E-mail: lorand.bartho@aok.pte.hu
<b>Abstract</b>	Maximum 500 characters
<p>Investigations both <i>in vitro</i> and <i>in vivo</i>, with the aim of</p> <ol style="list-style-type: none"> <li>1 studying mechanisms of and drugs acting on visceral smooth muscle contraction and relaxation</li> <li>2 identifying neurotransmitters that mediate smooth muscle movements</li> <li>3 studying functional innervation and motility-modifying drugs on human preparations (taken from surgery)</li> <li>4 investigating the effect of experimental inflammation and of anti-inflammatory drugs on visceral motor responses</li> </ol> <p><b>Human resources</b> MDs (3), PhD student (1), technical assistant (1), access to secretarial and computer operator's help</p> <p><b>Special instruments:</b> Organ bath systems, force and displacement transducers, and measuring bridges. Recording is on PC or compensographic recorders. Access to analgesymeters and to plethysmometer for measuring inflammatory oedema and hyperalgesia</p> <p><b>Products and services</b> Investigation of drugs acting on visceral (gastrointestinal, respiratory, urogenital) smooth muscles. <i>In vivo</i> and <i>in vitro</i> tests for pre-clinical characterisation in the course of development of new analgesic and anti-inflammatory drugs.</p>	
<b>Methods used</b>	Maximum 300 characters
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference
<b>Related Inventions Disclosures and Patents</b>	

<b>RECOOP HST Research Activity Inventory</b>	
Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.	
<b>Organization</b>	Institute of Laboratory Medicine, Medical School, University of Pécs
<b>Area of the Research</b>	Medicine, laboratory diagnostics, molecular diagnostics, and innovation
<b>Title of the Research Activity</b>	Molecular biology
<b>Department (complete address)</b>	<b>Principal Investigator or Head of the Research Group</b>
Institute of Laboratory Medicine, Medical School, University of Pécs H-7624 Pécs, Ifjúság útja 3, Hungary	Name: Prof. Dr. KOVÁCS L., Gábor
	Title: : Prof. Dr
	Tel: + 36 72 536120
	Fax: +36 72 536-121
	E-mail: gabor.l.kovacs@aok.pte.hu
	<b>Web:</b> www.aok.pte.hu
<b>Abstract</b>	Maximum 500 characters
<p><b>Research area</b></p> <ol style="list-style-type: none"> <li>1 The role of neuronal peptides, hormones and other laboratory parameters in alcohol- and drug-addiction processes</li> <li>2 The role of the ascending noradrenergic bundle in mediating the effect of neurohypophyseal neuropeptides on the central nervous system</li> <li>3 Effects of neurohypophyseal peptide fragments with enhanced neuronal but decreased peripheral hormonal effects</li> <li>4 The regulatory role of central oxytocin in neuroadaptive processes related to morphine- and heroin addiction</li> <li>5 The diagnostic and regulatory role of atrial natriuretic peptide in alcohol addiction</li> <li>6 The diagnostic role of laboratory parameters in addiction</li> <li>7 Interrelationship of the ionic environment with the cellular metabolism, with special regard to the glucose metabolism and calcium regulation</li> <li>8 Calcium homeostasis, calcium mediated signal transduction, their relation to the activity of phosphoglucomutase</li> <li>9 Genetic factors in multiple drug resistance (mdr and cyp 450)</li> <li>10 Development of ultrasensitive laboratory methods suitable for the measurement of bioactive substances</li> <li>11 Cellular and humeral mechanisms of inflammation</li> </ol> <p><b>Human resources</b> full professors (4), associate professors (4), assistant professor (1)</p> <p><b>Special instruments</b></p> <ul style="list-style-type: none"> <li>• automated, robotized clinical chemistry and immune chemistry analysers, high quality, high throughput instruments for radioimmunoassay and ELISA measurements, flow cytometer</li> <li>• regarding molecular diagnostics, real-time PCR, sequencing instruments, microchip reader</li> </ul>	

<b>Products and services</b>	
the laboratory is willing to participate in R&D projects related to the available technology	
<b>Methods used</b>	Maximum 300 characters
<b>Related references (max 3)</b>	Indicate the impact factor of the cited reference
<b>Related Inventions Disclosures and Patents</b>	

## RECOOP HST Research Activity Inventory

Please complete the template for each selected project your organization would like to share with the partners of the RECOOP HST Consortium and would like to invite other organizations to write FP7 or NIH proposals.

Slovak Medical University- **Department of Experimental and Applied Genetics**

Group	Head (name and e-mail address)
Laboratory of Molecular and Cell Toxicology	Katarina Volkovova, PhD.
Laboratory of Enzymology	katarina.volkovova@szu.sk
Laboratory of Genetics	
Laboratory of Nutrition	

### 2. Main areas of ongoing research in the Department

- effects of different environmental factors (chemical, and physical factors) on human organisms at molecular and cellular levels, with regard to their genotoxicity or their role in development of environmental diseases by using multidisciplinary approach and tools of molecular epidemiology
- investigation of the effect of one particular substance, or combined effect of occupational and environmental burden, from the point of view of their effect on human health
- identification of sensitive biomarkers of genotoxicity for populations exposed to environmental factors
- role of individual genotype in susceptibility to different environmental factors, in predisposition to different diseases and disease pathogenesis and its role in the aging process
- study of important processes at molecular and cellular level, which are critical in the development of cancer and other environmental diseases and in the aging process
- study the role of nutrition and antioxidant defense of the organism in the pathogenesis of environmental diseases, in disease prevention and in the aging process
- development, validation and standardisation of new biomarkers of exposure, effect and individual susceptibility; and of methods for diagnosis of early risk factors and for preventive medicine
- development of new methods for the detection of cytotoxicity, genotoxicity, mutagenicity, carcinogenicity and clastogenicity in vitro

### 3. Methods used in the Department

Method	Methods according to GLP	Specification
<b><i>Detection of cells viability</i></b>	ŠPP/MBT/M03	Detection of cells viability, e.g. after treatment with some toxic substance, or after thawing
<b><i>Comet assay</i></b> - oxidative DNA damage	ŠPP/MBT/M04	Measurement of DNA damage caused by different substances on the level of individual cells
<b><i>Repair capacity of enzyme extract from lymphocytes</i></b>	ŠPP/MBT/M06; M48	Measurement of differences in DNA repair capacity by using enzyme extracts from lymphocytes
<b><i>Tissue cultures cultivation, conditions of freezing and thawing</i></b>	ŠPP/MBT/M07	Cells cultivation, work with tissue cultures

<b>Cells treatment with investigated substances</b>	ŠPP/MBT/M08	In vitro cultured cells treatment with an investigated substance for subsequent Comet assay
<b>Chromosome aberrations in human peripheral lymphocytes</b>	ŠPP/MBT/M23	Exposure evaluation in people exposed to genotoxic substances, evaluation of mutagenicity of in vitro applied foreign substances
<b>Micronucleus test in human peripheral lymphocytes with cytochalasin B</b>	ŠPP/MBT/M24	Detection of genetic changes in the I. cell division after treatment with mutagens
<b>Sister chromatide exchanges in human peripheral lymphocytes</b>	ŠPP/MBT/M26	Monitoring of exposed subjects, detection of the rate of cell proliferation in vitro; evaluation of genetic changes in cells after treatment with foreign substance in vitro
<b>Preparation of substances for cytotoxicity testing in vitro</b>	ŠPP/MBT/M32	
<b>Cytotoxicity testing in vitro</b>	ŠPP/MBT/M33	Estimation of the cells biological response after treatment with the investigated substance