МІЖНАРОДНІ ПУБЛІКАЦІЇ УКРАЇНСЬКИХ АВТОРІВ

Bilyy R., Korniy N., Tomin A., Chop'yak V., Tolstyak Y., Antonyuk V., Stoika R.

Two-step chromatography purification of IgGs possessing sialidase activity from human blood serum

[et al] (2015)
Biomed. Chromatogr. 29: 328–332 (IF=1.723)

The characteristics of gallium selenide with a ferroelectric liquid crystal in between its layers are studied. The liquid crystal consists of an achiral smectic (a derivative of phenyl benzoate) and a chiral component. The frequency behavior of the specific impedance, permittivity, and loss tangent at different temperatures, in a magnetic field, and under illumination are found.

Bilyy R.

Glycopolymers as Antiadhesives of E. coli Strains Inducing Inflammatory Bowel Diseases

[et al] (2015)
Biomacromolecules. 16: 1827−1836. (IF=5.750)

n-Heptyl α-D-mannose (HM) is a nanomolar antagonist of FimH, a virulence factor of E. coli. Herein we report on the construction of multivalent HM-based glycopolymers as potent anti-adhesives of type 1 piliated E. coli. We investigate glycopolymer/FimH and glycopolymer/bacteria interactions and show that HM-based glycopolymers efficiently inhibit bacterial adhesion and disrupt established cell-bacteria interactions in vitro at very low concentration (0.1 μM on a mannose unit basis). On a valency-corrected basis, HM-based glycopolymers are respectively one hundred and one million times more potent than HM and D-mannose for their capacity to disrupt the binding of adherent-invasive E. coli to T84 intestinal epithelial cells. Finally we demonstrate that the anti-adhesive capacities of HM-based glycopolymers are preserved ex vivo in the colonic loop of a transgenic mouse model of CD. All together, these results underline the promising scope of HM-based macromolecular ligands for the anti-adhesive treatment of E. coli induced inflammatory bowel diseases.

Bilyy R.

The Pathogenicity of Anti-2GP1-IgG Autoantibodies Depends on Fc Glycosylation

[et al] (2015)
Journal of Immunology Research, Article ID 638129, 1–12 (IF=2.934)

To analyze the glycosylation of anti-β2GP1, we investigated purified IgG from healthy children, patients with APS, and asymptomatic adult carriers of antiphospholipid antibodies. We observed that in the sera of healthy children and of patients with APS, IgG3 and IgG2 were predominant, respectively. The potentially protective anti-β2GP1-IgM was lower in the sera of healthy children. Although anti-β2GP1-associated C1q did not differ between children and patients with antiphospholipid syndrome, the associated C3c was significantly higher in the sera of healthy children. This indicates a more efficient clearance of anti-β2GP1 immune complexes in the healthy children. This clearance is not accompanied by inflammation or coagulatory events. It is likely that the most important pathogenic factor of the anti-β2GP1-IgG is related to the different glycosylation observed in healthy and diseased individuals. We detected a significantly higher sialylation of anti-β2GP1-IgG isolated from the sera of healthy children and asymptomatic adults when compared with that of patients with clinically apparent antiphospholipid syndrome. Low sialylated IgG reportedly ameliorates inflammation and inflammation promotes hyposialylation. Thus, both reactions create a vicious circle that precipitates the pathology of the antiphospholipid syndrome including thrombus-formation. We conclude that the increased sialylation of anti-β2GP1-IgG of sera of healthy individuals limits their pathogenicity.

Bilyy R.

Surface Plasmon Resonance (SPR) for the Evaluation of Shear-Force-Dependent Bacterial Adhesion

[et al] (2015)
Biosensors. 5(2):276–287

The colonization of Escherichia coli (E. coli) to host cell surfaces is known to be a glycan-specific process that can be modulated by shear stress. In this work we investigate whether flow rate changes in microchannels integrated on surface plasmon resonance (SPR) surfaces would allow for investigating such processes in an easy and high-throughput manner. We demonstrate that adhesion of uropathogenic E. coli UTI89 on heptyl α-d-mannopyranoside-modified gold SPR substrates is minimal under almost static conditions (flow rates of 10 μL•min−1), and reaches a maximum at flow rates of 30 μL•min−1 (≈30 mPa). This concept is applicable to the investigation of any ligand-pathogen interactions, offering a robust, easy, and fast method for screening adhesion characteristics of pathogens to ligand-modified interfaces.

Key words: *surface plasmon resonance (SPR), shear force enhancement, flow rate, Escherichia coli (E. coli), carbohydrates.*

Bilyy R.

Can we use rare-earth nanocrystals to target glycans for the visualization of melanoma?

[et al] (2015)
Nanomedicine 10(13), 1997–2000. (IF=5.413)

Neutrophil extracellular trap (NET) formation contributes to gout, autoimmune vasculitis, thrombosis, and atherosclerosis. The outside-in signaling pathway triggering NET formation is unknown. Here we show that the receptor-interacting protein kinase (RIPK)-1-stabilizers necrostatin-1 or necrostatin-1s and the mixed lineage kinase domain-like (MLKL)-inhibitor necrosulfonamide prevent monosodium urate crystal- or PMA-induced NET formation in human and mouse neutrophils. These compounds do not affect PMA- or urate crystal-induced production of reactive oxygen species (ROS). Moreover, neutrophils of chronic granulomatous disease patients are shown to lack PMA-induced MLKL phosphorylation. Genetic deficiency of RIPK3 in mice prevents MSU-crystal-induced NET formation in vitro and in vivo. Thus, neutrophil death and NET formation may involve the signaling pathway defining necroptosis downstream of ROS production. These data imply that RIPK1, RIPK3, and MLKL could represent molecular targets in gout or other crystallopathies. This article is protected by copyright. All rights reserved.

Bolshakova S., Belyaev M., Bulavin V., Brudnyi V., Chekanov V.

Experimental Evaluation of Stable Long Term Operation of Semiconductor Magnetic Sensors at ITER Relevant Environment

[et al] (2015)
Nuclear Fusion. 55.(8): P. 083006–083014. (IF=3.062)

The paper deals with radiation resistant sensors and their associated measuring instrumentation developed in the course of R and D activities carried out in the framework of an international collaboration. The first trial tests of three-dimensional (3D) probes with Hall sensors have been performed in European tokamaks TORE SUPRA (2004) and JET (2005). Later in 2009 six sets of 3D probes were installed in JET and now continue to operate. The statistical analysis performed in 2014 on the basis of the JET database have demonstrated stable long term operation of all 18 sensors of 3D probes. The results of measurements conducted at the neutron fluxes of nuclear reactors have demonstrated the operability of the sensors up to high neutron fluences of F > 1018n bold dot cm−2 that exceeds the maximum one for the locations of steady state sensors in ITER over its total lifetime.

Cherkas A.

Targeted 25-Hydroxyvitamin D3 1α Hydroxylase Adoptive Gene Therapy Ameliorates DSS-induced Colitis without Causing Hypercalcemia in Mice

[et al] (2015)
Molecular Therapy. 23(2): 339–351 (IF=6.227)

Systemic 1,25(OH)2D3 treatment ameliorating murine IBD could not be applied to patients because of hypercalcemia. We tested the hypothesis that increasing 1,25(OH)2D3 synthesis locally by targeting deli10very of the 1α-hydroxylase gene (CYP27B1) to the inflamed bowel would ameliorate IBD without causing hypercalcemia. Our targeting strategy is the use of CD11b(+)/Gr1(+) monocytes as the cell vehicle and a macrophage-specific promoter (Mac1) to control CYP27B1 expression. The CD11b(+)/Gr1(+) monocytes migrated initially to inflamed colon and some healthy tissues in DSS colitis mice; however, only the migration of monocytes to the inflamed colon was sustained. Adoptive transfer of Gr1(+) monocytes did not cause hepatic injury. Infusion of Mac1-CYP27B1-modified monocytes increased body weight gain, survival, and colon length, and expedited mucosal regeneration. Expression of pathogenic Th17 and Th1 cytokines (IL-17a and IFN-γ) was decreased, while expression of protective Th2 cytokines (IL-5 and IL-13) was increased, by the treatment. This therapy also enhanced tight junction gene expression in the colon. No hypercalcemia occurred following this therapy. In conclusion, we have for the first time obtained proof-of-principle evidence for a novel monocyte-based adoptive CYP27B1 gene therapy using a mouse IBD model. This strategy could be developed into a novel therapy for IBD and other autoimmune diseases. Molecular Therapy (2014); doi:10.1038/mt.2014.201.

Chopyak V., Stoika R.

Calf thymus histone-conjugated magnetic poly(2-oxoethyl methacrylate) microspheres for affinity isolation of anti-histone IgGs from the blood serum of patients with systemic lupus erythematosus.

[et al] (2015)
RSC Advances. 5: 63050–63055 (IF=3.84)

Systemic lupus erythematosus (SLE) is a heterogeneous, inflammatory and multisystem autoimmune disease in which antinuclear antibodies are present in blood often years before clinical symptoms occur. Isolating the antibodies is thus of crucial importance to confirm the diagnosis and prognosis of patients with some autoimmune diseases. Isolation can be performed advantageously using magnetic microspheres, which offer easy and quick manipulation with a magnet and avoid sample dilution. Here, we developed calf thymus histone-conjugated magnetic poly(2-oxoethyl methacrylate) (POEMA–His) microspheres using a multiple-stage swelling technique followed by His immobilization. Magnetic POEMA–His microspheres were characterized using scanning and transmission electron microscopy, SQUID, ATR FT-IR spectroscopy, elemental analysis and atomic absorption spectrometry. The microspheres were successfully used for rapid purification of the anti-histone immunoglobulins (IgGs) from blood serum samples of a cohort of systemic lupus erythematosus patients.

Fedorov V.

Characteristics of leukocyte profile of blood and criteria sirs in patients with abdominal sepsis

[et al] (2015)
The Pharma Innovation. 3: 68–70

Results of surgical treatment of 284 patients with acute appendicitis, cholecystitis, infected pancreatic necrosis and perforation of the stomach ulcer or duodenal ulcer were analyzed. All patients were divided into two groups: I - 100 patients with abdominal sepsis (35.2%) and II - 184 - without it. The study found that abdominal sepsis developed significantly more often in elderly and senile patients Postoperative complications and mortality are significantly more frequently encountered in patients with AS, respectively, 8.6% versus 2.8% and 10% versus 1.6% Abdominal sepsis resulted in a high level of LII and reduction of the absolute number of lymphocytes, which can be considered an objective evidence of potentiated endogenous intoxication and immunosuppression..

Key words: *acute abdominal surgical pathology, abdominal sepsis, the criteria for SIRS, leukocyte profile. 1.*

Iefremova U., Lychkovska N., Fafula R., Vorobets Z.

Characteristic of NO-synthase of peripheral blood lymphocytes of patients with rheumatic pathology

[et al] (2015)
Journal of Medical Science. 84(1): 46-54

It is known that NO is a ubiquitous mediator which acts as a universal modulator of various functions in organism and is produced by three isoforms of NO synthase. Nowadays the role of NO in the development of autoimmune diseases is actively studied. However, it remains unclear the biochemical and biophysical mechanisms of disturbances of NOS activity in blood lymphocytes at autoimmune process. The aim of present work is to study the kinetic properties of NO-synthase of peripheral blood lymphocytes of patients with rheumatic pathology. The study was carried out on peripheral blood lymphocytes isolated from patients with rheumatoid arthritis and ankylosing spondylitis. NOS activity was determined on the saponin-permeabilized blood lymphocytes. The difference between the values of NADPH oxidation with L-Arg and with inhibitor L-NAME reflects the value of the NADPH oxidation, ie total NOS activity. The kinetic properties of NO-synthase in peripheral blood lymphocytes of patients with rheumatic pathology were studied. It was found that the development of rheumatic pathology is associated with an imbalance in the NO synthesis and changes of kinetic parameters of NOS. It was shown that reduction in eNOS activity is accompanied by a sharp increase in activity of its inducible form. It was established that inhibition of eNOS occurs by noncompetitive type. NO production in lymphocytes of patients with rheumatic diseases is mainly realized by iNOS, whereas under normal physiological conditions endothelial form of the enzyme is being involved.

Key words: *NO-synthase, nitric oxide, lymphocytes, rheumatoid arthritis, ankylosing spondylitis.*

Shatynska-Mytsyk I.

Anticancer Activity of Essential Oils: Targeting of Protein Networks in Cancer Cells

[et al] (2015)
Asian Pac. J. Cancer Prev., 15/DOI 10.7314/APJCP.2014.15. (IF= 2.51)

Cancer is a multifaceted and genomically complex disease and research over decades has gradually and sequentially shown that essential biological mechanisms including cell cycle arrest and apoptosis are deregulated. The benefits of essential oils from different plants have started to gain appreciation as evidenced by data obtained from cancer cell lines and xenografted mice. Encouraging results obtained from preclinical studies have attracted considerable attention and various phytochemicals have entered into clinical trials.

Key words: *essential oils, cancer, apoptosis, signaling.*

Shatynska-Mytsyk I.

The Impact of thyroid hormone replacement therapy on left ventricular diastolic function in patients with subclinical hypothyroidism

[et al] (2015)
J. Endocrinol. Invest., 40618 DOI 10.1007/s40618-015-0262-2. (IF=1.448)

OBJECTIVE: Subclinical hypothyroidism (SH) is associated with a moderately elevated risk of heart failure events among older adults. The objective of our prospective study was to assess the impact of thyroid hormone replacement therapy (HRT) with low doses of L-thyroxine (6.25-25 μg/day) on left ventricular diastolic function in patients with SH.

MATERIALS AND METHODS: 33 patients with SH and 25 healthy controls were involved. All participants underwent standard echocardiography and Doppler imaging at baseline and, the patient group, also after a course of HRT.

RESULTS: At baseline, patients with SH showed significantly lower E (0.79 ± 0.22 vs. 0.93 ± 0.19, $p < 0.001$), E/A ratio (1.19 ± 0.29 vs. 1.31 ± 0.25, $p < 0.003$), and higher intraventricular septum thickness (IVST) (0.99 ± 0.14 vs. 0.89 ± 0.18, $p < 0.001$) in comparison with healthy controls. After 6 months of therapy, the E/A ratio underwent significant increase (1.28 ± 0.21 vs. 1.19 ± 0.29, $p < 0.001$), while the IVS displayed a robust reduction (0.92 ± 0.16 vs. 0.99 ± 0.14, $p < 0.001$).

CONCLUSIONS: HRT with low-dosed L-thyroxine may improve left ventricular diastolic function in patients with SH.

Tkach I.R., Sosnina K.O., Huleyuk N.L., Terpylyak O.I., Zastavna D.V., Akopyan H., Weise A., Kosyakova N., Liehr T.

Contribution of chromosomal abnormalities and genes of the major histocompatibility complex to early pregnancy losses

[et al] (2015)
Biopolymers and Cell. 31(1): 38–45

Aim. The determination of chromosomal abnormalities in samples from early pregnancy losses and allelic polymorphism of HLA–DRB1 and DQA1 genes in couples with recurrent miscarriage. Methods. Banding cytogenetic and interphase mFISH analysis, DNA extraction by salting method, PCR, agarose gel electrophoresis. Results. Cytogenetic and molecular-cytogenetic investigations of SA material identified karyotype anomalies in 32.4% of cases with prevalence of autosomal trisomy – 42.65%, triploidy – 30.38% and monosomy X – 19.11%. Complex analysis of frequency and distribution of allelic variants of genes HLA-DRB1 and HLA-DQA1 allowed establishing the alleles DRB1*0301, DRB1*1101-1104 and DQA1*0501 to be aggressor alleles in women with recurrent pregnancy loss (RPL). The cumulative homology of allelic polymorphism of more than 50% of HLA-DRB1 and HLA-DQA1 loci between partners increases the risk of RPL by almost four times. Conclusion. The detected chromosome aneuploidies in the samples from products of conception and the changes in the major histocompatibility complex genes can cause the failure of a couples reproductive function and can lead to an early fetal loss.

Tolstyak Y., Kril I., Mahorivska I., Bila E., Stoika R., Herrmann M., Kit Y. and Bilyy R.

Desialylation of dying cells with catalytically active antibodies possessing sialidase activity facilitate their clearance by human macrophages

[et al] (2015)
Clinical and Experimental Immunology. Jan;179(1):17-23. doi: 10.1111/cei.12312. (IF=3.037)

Recently we reported the first known incidence of antibodies possessing catalytic sialidase activity (sialidase abzymes) in the serum of patients with multiple myeloma and systemic lupus erythematosus (SLE). These antibodies desialylate biomolecules, such as glycoproteins, gangliosides and red blood cells. Desialylation of dying cells was demonstrated to facilitate apoptotic cell clearance. In this study we assessed the possibility to facilitate dying cell clearance with the use of F(ab)2 fragments of sialidase abzymes. Two sources of sialidase abzymes were used: (i) those isolated from sera of patients with SLE after preliminary screening of a cohort of patients for sialidase activity; and (ii) by creating an induced sialidase abzyme through immunization of a rabbit with synthetic hapten consisting of a non-hydrolysable analogue of sialidase reaction conjugated with bovine serum albumin (BSA) or keyhole limpet haemocyanin (KLH). Antibodies were purified by ammonium sulphate precipitation, protein-G affinity chromatography and size exclusion-high performance liquid chromatography (HPLC-SEC). Effect of desialylation on efferocytosis was studied using human polymorphonuclear leucocytes (PMN), both

viable and aged, as prey, and human monocyte-derived macrophages (MoMa). Treatment of apoptotic and viable prey with both disease-associated (purified from blood serum of SLE patients) and immunization-induced (obtained by immunization of rabbits) sialidase abzymes, its F(ab)2 fragment and bacterial neuraminidase (as positive control) have significantly enhanced the clearance of prey by macrophages. We conclude that sialidase abzyme can serve as a protective agent in autoimmune patients and that artificial abzymes may be of potential therapeutic value.

Key words: *abzyme, apoptosis, desialylation, efferocytosis, sialidase.*

Zinchuk A., Holubovska O., Shkurba A., Hrytsko R., Vorozhbyt O., Richniak M., Herasun B.

Original inhibition method of excessive synthesis of pro-inflammatory cytokine of tumour necrosis factor α

[et al] (2015)
Cent Eur J Immunol. 40(3): 345-348. (IF= 0.28)

Influence on pro- and anti-inflammatory cytokines of an ill person is an urgent aspect of treatment of many diseases. For inhibition of synthesis of a high level of pro-inflammatory cytokines, medications which are recombinant monoclonal antibodies, especially to tumour necrosis factor α (TNF-α), are used. However, these methods of treatment require further improvement by elaborating new approaches with a wider spectrum of influence on the immune system.

A completely new method of reduction in high activity of TNF-α with the method of intradermal autoleukocyte immunization is presented in the article. Investigation was performed in a group of patients with psoriasis (24) with a high level of TNF-α in the blood (over 30 pg/ml). Simultaneously such investigation was performed on patients with psoriasis (9) without TNF-α detected (0 pg/ml).

As a result of immunization, a significant reduction in TNF-α occurred in all patients with its high level, in 16 (66.7%) from 24 patients – to 0-5 pg/ml. The level of reduction and duration of the achieved effect was of an individual character and requires further investigation. However, the achieved results prove the expediency of administration of this immunization method for patients requiring reduction of TNF-α synthesis.

However, the content of TNF-α in blood serum could not be detected in most patients with a low level of cytokine (in 6 from 9) after immunization (as well as before immunization), but an increase in its level from 0 to 5-8 pg/ml was observed in 3 patients. On the basis of the conducted research, the authors suggest that the influence of immunization on cytokine synthesis depends on the condition of immune cells and correlation of pro- and anti-inflammatory cytokines in a patient's skin.

Key words: *cytokines, TNF-α, intradermal autoleukocyte immunization, psoriasis, rheumatoid arthritis*

Zorenko Yu., Gorbenko V., Vasylkiv Ja., Zelenyj A.

Growth and luminescent properties of scintillators based on the single crystalline films of Lu3-xGdxAl5O12: Ce garnet

[et al] (2015)
Materials Research Bulletin. 64: 355–363. (IF=2.288)

The work is related to the growth of scintillators based on the single crystalline films (SCF) of Ce3+ doped Lu3−GdxAl5O12 mixed rare-earth garnets by Liquid Phase Epitaxy (LPE) method. We have shown, that full set of Lu3−GdxAl5O12 SCFs with x values ranging from 0 to 3.0 can be successfully crystallized by the LPE method onto Y3Al5O12 (YAG) substrates from the melt-solutions based on PbO-B2O3 flux. The absorption, X-ray excited luminescence, photoluminescence, thermoluminescence and light yield measurements, the latter under excitation by α-particles of 239Pu and 241Am radioisotopes, were applied for their characterization.

B. Li, D.J. Baylink, M.H. Walter, K.H. Lau, X. Meng, J. Wang, A. Cherkas, X. Tang, X. Qin

Targeted 25-hydroxyvitamin D3 1α-hydroxylase adoptive gene therapy ameliorates DSS-induced colitis without causing hypercalcemia in mice

Molecular Therapy (Impact Factor: 6,23).
2015, Volume 23, Issue 2, Pages 339-351. DOI: 10.1038/mt.2014.201

Systemic 1,25(OH)2D3 treatment ameliorating murine inflammatory bowel diseases (IBD) could not be applied to patients because of hypercalcemia. We tested the hypothesis that increasing 1,25(OH)2D3 synthesis locally by targeting delivery of the 1α-hydroxylase gene (CYP27B1) to the inflamed bowel would ameliorate IBD without causing hypercalcemia. Our targeting strategy is the use of CD11b(+)/Gr1(+) monocytes as the cell vehicle and a macrophage-specific promoter (Mac1) to control CYP27B1 expression. The CD11b(+)/Gr1(+) monocytes migrated initially to inflamed colon and some healthy tissues in dextran sulfate sodium (DSS) colitis mice; however, only the migration of monocytes to the inflamed colon was sustained. Adoptive transfer of Gr1(+) monocytes did not cause hepatic injury. Infusion of Mac1-CYP27B1-modified monocytes increased body weight gain, survival, and colon length, and expedited mucosal regeneration. Expression of pathogenic Th17 and Th1 cytokines (interleukin (IL)-17a and interferon (IFN)-α) was decreased, while expression of protective Th2 cytokines (IL-5 and IL-13) was increased, by the treatment. This therapy also enhanced tight junction gene expression in the colon. No hypercalcemia occurred following this therapy. In conclusion, we have for the first time obtained proof-of-principle evidence for a novel monocyte-based adoptive CYP27B1 gene therapy using a mouse IBD model. This strategy could be developed into a novel therapy for IBD and other autoimmune diseases.

A. Cherkas, O. Abrahamovych, S. Golota, C. Pichler, A. Nersesyan, V. Serhiyenko, N. Zarkovic, P. Eckl

The correlations of glycated hemoglobin and carbohydrate metabolism parameters with heart rate variability in apparently healthy sedentary young male subjects

Redox Biology. 2015 Volume 5, Pages 301-307; DOI: 10.1016/j.redox.2015.05.007

INTRODUCTION: Sedentary lifestyle is a major risk factor for diabetes, cardiovascular and many other age-related diseases. Heart rate variability (HRV) reflects the function of regulatory systems of internal organs and may sensitively indicate early metabolic disturbances. We hypothesize that quantitative and qualitative changes of HRV in young subjects may reflect early metabolic derangements responsible for further development of clinically significant disease.

AIM: The aim of our study was to determine whether the parameters of carbohydrate metabolism (fasting blood glucose, HBA1c and surrogate insulin sensitivity/resistance indices) correlate with anthropometric data and HRV.

METHODS: The study group consisted of 30 healthy sedentary male subjects aged 20-40, nonsmokers, mainly office and research employees, medical staff and students. Athletes, actively training more than one hour per week, severely obese and men of physical work were excluded from the study. HRV parameters were derived from short term ECG records (five minutes intervals) in supine position and during orthostatic test. Anthropometric data included height, weight, body mass index (BMI), age and body composition (estimation by bioelectric impedance method). The fasting blood glucose, insulin and C-peptide, homeostatic model assessment (HOMA-IR) index and glycated hemoglobin (HbA1c) were evaluated. Linear correlation coefficient (r) was calculated using Statistica 10.0 software.

RESULTS AND DISCUSSION: HOMA-IR index correlated positively with body weight, visceral fat and BMI (p=0.047, 0.027 and 0.017 respectively). In supine position pNN50 positively correlated with glucose/insulin ratio (p=0.011) and heart rate with HOMA-IR (p=0.006). In orthostatic test negative correlations of HBA1c with standard deviation, total and low frequency power were determined (p=0.034, 0.400 and 0.403 respectively), which indicates a gradual worsening of functional capacity of cardiovascular system with low-grade increase (under the conventional threshold) of HBA1c.

CONCLUSIONS: In apparently healthy sedentary subjects HRV reduction correlates with the age advancement, subclinical deteriorations of carbohydrate metabolism and excessive fat accumulation.

Key words: *sedentary lifestyle, glycated hemoglobin, heart rate variability, insulin sensitivity, correlations.*

A. Cherkas, R. Zhuraev

A marked decrease in heart rate variability in Marfan syndrome patients with confirmed FBN1 mutations

Cardiology Journal 2015 Oct 27. doi: 10.5603/CJ.a2015.0076.

BACKGROUND: The studies on heart rate variability (HRV), an important predictor of all-cause mortality, in Marfan syndrome (MS), up to now have not been reported, especially in patients with FBN1 mutations.

METHODS: Among 18 MS patients with the phenotype of MS meeting inclusion criteria 15 have had a FBN1 gene mutation. Short ECG records were performed in the supine position and during orthostatic tests. Control group consisted of 30 apparently healthy non-athletes matched by age and gender.

RESULTS: Heart rates in MS patients with the FBN1 mutation were increased in both the supine position and orthostatic test ($p<0.001$). Most of the time-domain (standard deviation, pNN50) and frequency-domain (total power, very low, low, and high frequency) parameters of HRV were significantly reduced in the MS patients ($p<0.001$).

CONCLUSIONS: A marked decrease of HRV, documented in the study, may be an important clinical feature in MS patients with confirmed FBN1 gene mutations.

Key words: *Marfan syndrome, FBN1 mutation, heart rate variability, heart rate, autonomic control, transforming growth factor beta, metabolism.*

Lesya Mateshuk-Vatseba, Uliana Pidvalna, Andriy Kost

Peculiarities of vascular tunic microstructure of the white rat eyeball under the effect of opioid

Romanian Journal of Morphology and Embryology, 2015, 56(3): 1057—1062

OBJECTIVE: This article deals with determination of changes in the structural organization of vascular tunic of the eyeball under the effect of opioid.

MATERIALS AND METHODS: The study was carried out on 24 mature white male rats aged 3.0–4.5 months and 170–280 g weight. The research material included histological specimen and semi-thin sections of white rats' eyeball vascular tunic. For the histological study, microscopic sections of the eyeball were stained with Hematoxylin and Eosin, Heidenhain's Azan trichrome. Specimens were studied and photographed with microscope magnification: ×600, ×1000.

RESULTS: The first signs of microstructure disorder in all parts of vascular tunic of the eyeball are noticeable after two weeks of nalbuphine injection to the white rats. During the next four weeks of the experiment, the pathological changes increase and are manifested by the swelling and polymorphonuclear infiltration of the iris, ciliary body, choroid and by deep destructive changes of eyeball hemomicrocirculatory bloodstream. Histological and ultramicroscopic studies of the white rats' eyeball vascular tunic after six weeks of nalbuphine injections showed deep destructive changes in the structure of all parts of vascular tunic.

CONCLUSIONS: Our study demonstrated a negative effect of the prolonged injection of opioid in the experiment on the state of microstructural organization of the eyeball vascular tunic. Development of angiopathy is the triggering for occurrence of destructive changes in the eyeball under the effect of opioid.

Key words: *eyeball, microstructure, nalbuphine, experiment, hemomicrocirculatory bloodstream.*

Mateshuk-Vatseba L.R., Zinko A.V.

Ultrastructural organization of corpus callosum under the effect of Nalbufin in the experiment

Actual issues of morphology, 2015, 70 (1): 83—88

BACKGROUND: Development of pharmacotherapy with the use of opiates and opioids requires elaboration of measures to prevent and offset the side effects and complications that they cause, especially for the brain sensitive to the drug therapy effects because of the nature of its structure and function.

MATERIAL AND METHODS: The study was carried out on 24 mature white male rats aged 4.5 – 5.5 months and body weight 130-180 g. Nalbufin was intramuscularly injected to the experimental animals as follows: 1st week – 8mg/kg, 2nd week – 15 mg/kg, 3rd week – 20 mg/kg, 4th week – 25 mg/kg, 5th week – 30 mg/kg, 6th week – 35 mg/kg. The work was carried out using the method of electron microscopy. The study and photographing of the material was conducted with the aid of УЕМБ-100 К microscope at acceleration speed 75 kV and magnification on the microscope screen ´ 4000– 8000.

RESULTS: The work presents data on ultrastructural organization of the corpus callosum of the white rat in the norm and in the dynamics of the long-term effect of opioid. Corpus callosum of the white rat is formed by myelinated and nonmyelinated fibers. The first changes in the ultrastructure of corpus callosum are observed already after 2 weeks of injecting nalbufin to the experimental animals and continue to increase throughout the subsequent stages of the experiment. Principal manifestation of the neuropathy of the corpus callosum, in case of injection of nalbufin, during 6 weeks is degradation of axis cylinders of the nerve fibers, glial cells. Morphological changes characteristic of microangiopathy are taking place in parts of the hemomicrocirculatory bloodstream of corpus callosum.

CONCLUSIONS: Thus, continuous injection of nalbufin predetermines changes in ultrastructural organization of the corpus callosum. This work is the basis for further studies to be conducted by morphologists and neurologists with the objective of elaboration in the future of the new methods of diagnosing and prevention of brain pathology caused by prolonged use of opioids.

Key words: *corpus callosum, ultrastructure, opioid, experiment.*

Ivankiv T, Ogurtsov O, Pokhylevych G.

Organized hematoma mimicking retroperitoneal cystic tumors

International Journal of Surgery Case Reports.
2015 Nov 11. 10/2015; 16(1). DOI:10.1016/j.ijscr.2015.10.039

INTRODUCTION: Isolated retroperitoneal cysts are uncommon with an estimated incidence of 1/5750 to 1 / 250,000. In women they occur about 1.5-2 times more often than in men. The largest numbers of patients are young or middle aged (20-50 years). Lack of knowledge about the causes of these rare entities and asymptomatic clinical picture often leads to diagnostic and tactical mistakes.

METHODS: The medical history of 54-year old male patient B., who has been hospitalized at Surgical Department №1 of Danylo Halytsky Lviv National Medical University (Surgical Department of Lviv Regional Clinical Hospital), was processed retrospectively.

RESULT: Diagnosing of retroperitoneal organized hematoma in the early stages is not always possible, because exploration of retroperitoneal space can be difficult. General tests and tumor markers are usually normal range and not prognostically informative in this case. Decisively important were imaging diagnostic methods - USG and CT. As clinical cases of organized hematoma are quite rare, finding out retroperitoneal formation with irregular contours and infiltrative component indicates for retroperitoneal tumors. Thus, this formation accumulated contrast that says for increased vascularization. Intraoperative: formation with thick walls and heterogeneous structure. Histological diagnosis: hematoma in a phase of deep organization. On our opinion, taking into account location and structure of tumors, laparoscopic intervention was not appropriate, open surgery was reasonable approach. Preoperative biopsy has a crucial role to set preliminary diagnosis.

CONCLUSION: Despite the fact that organized retroperitoneal hematomas are quite rare, their diagnosis requires detailed examination and histological verification.

Key words: *Organized hematoma, cystic tumors, retroperitoneal space.*

Матеріал міжнародних публікацій
підготувала Наталя СЕМЕНЦІВ