SESSION XII

GASTROINTESTINAL PHYSIOLOGY AND PATHOPHYSIOLOGY PANCREAS AND LIVER

Wednesday (September 15, 2021; 10:50 – 13:20)
Thursday (September 16, 2021; 14:00 –15:30)

Chair:

Prof. Tomasz Brzozowski
Department of Physiology, Faculty of Medicine,
Jagiellonian University Medical College, Krakow, Poland

DETAILED SESSION XII SCHEDULE

Opening lectures (Wednesday, September 15, 2021; 10:50 – 11:55; *virtual stream B*)

S12.L1 ROLE OF MICROBIOTA-BRAIN-GUT AXIS IN PHYSIOLOGY AND PATHOPHYSIOLOGY OF GASTROINTESTINAL TRACT. **P.C. Konturek[1], W. Dieterich[2], Y. Zopf[2]** ([1]Thuringia Clinic Saalfeld, Teaching Hospital of the University of Jena, Saalfeld, Germany, [2]Department of Medicine I, Hector Center for Nutrition and Sport, University Erlangen-Nuremberg, Erlangen, Germany).

S12.L2 LIPIDS AND INFLAMMATORY BOWEL DISEASES - FRIENDS OR FOES? **J. Fichna** (Department of Biochemistry, Medical University of Lodz, Lodz, Poland).

S12.L3 THE INTERPLAY BETWEEN ENDOGENOUS GASEOUS MEDIATORS, CARBON MONOXIDE AND HYDROGEN SULFIDE IN PHYSIOLOGY AND PATHOPHYSIOLOGY OF GASTROINTESTINAL TRACT. **M. Magierowski** (Cellular Engineering and Isotope Diagnostics Laboratory, Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland).

Oral presentations (Wednesday, September 15, 2021; 11:55 – 13:20; *virtual stream B*)

S12.L4 ADMINISTRATION OF OBESTATIN ACCELERATES THE HEALING OF LINGUAL ULCERS IN RATS. **A. Stempniewicz[1], P. Ceranowicz[1], W. Macyk[2], J. Cieszkowski[1], G. Ginter[1], B. Kusnierz-Cabala[3], K. Galazka[4], M. Maraj[1], Z. Warzecha[1]** ([1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Inorganic Chemistry, Faculty of Chemistry, Jagiellonian University, Krakow, Poland, [3]Department of Diagnostics, Chair of Clinical Biochemistry, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [4]Department of Pathomorphology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland).

S12.L5 ANAEROBIC PHYSICAL TRAINING PREVENT GASTRIC EMPTYING DELAY AND ALTERATION IN FOOD BEHAVIOR IN RATS DEXAMETHASONE-TREATMENT. P.V.N. **Telles[1], L.C.S. Oliveira[1], J.F.R. Sousa[1], A.K.M. Cavalcante[2], A.A. Santos[2], M. Tolentino[1]** ([1]Laboratory of Exercise and Gastrointestinal Tract, Department of Physical Education, Federal University of Piaui, Teresina-PI, Brazil, [2]Department of Physiology and Pharmacology, School of Medicine, Federal University of Ceara, Fortaleza-CE, Brazil).

S12.L6 PROTECTIVE ADIPONECTIN ACTION AGAINST EXPERIMENTAL MUCOSAL DAMAGE IN THE GASTROINTESTINAL TRACT. **S. Kwiecien, A. Szlachcic, D. Wojcik, J. Majka, Z. Sliwowski, A. Danielak, A. Wojcik, K. Magierowska, M. Magierowski, T. Brzozowski** (Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland).

S12.L7 TIME-DEPENDENT MODULATING EFFECT OF SYSTEMIC INFLAMMATION ON THE SOMATOTROPIC AXIS SIGNAL TRANSDUCTION. **M. Wojcik, A. Krawczynska, W. Wiechetek, J. Bochenek, M. Tomczyk, A. Antushevich, A.P. Herman** (The Kielanowski Institute of Animal Physiology and Nutrition, Polish Academy of Sciences, Jablonna, Poland).

S12.L8 *HELICOBACTER PYLORI* INFECTION TRIGGERS ACTIVATION OF HUMAN FIBROBLASTS. A NEW TARGET OF GASTRIC CARCINOGENESIS? **G. Krzysiek-Maczka[1], A. Targosz[1], D. Wnuk[2], U. Szczyrk[1], M. Wierdak[3], M. Strzalka[1], T. Brzozowski[1], J. Czyz[2], A. Ptak-Belowska[1]** ([1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Cell Biology, the Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Krakow, Poland, [3]Department of Endoscopic, Metabolic and Soft Tissue Malignancies Surgery of University Hospital Jagiellonian University Medical College, Krakow, Poland).

Session summary

Poster session (Thursday, September 16, 2021; 14:00 –15:30; *virtual stream D*)

S12.P1 GASTROINTESTINAL (GI) SAFETY AND EFFICACY OF NOVEL HYDROGEN SULFIDE-RELEASING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS. **A. Danielak[1], U. Glowacka[1], K. Magierowska[1], D. Wojcik[1], J. Hankus[2], M. Szetela[1], J. Cieszkowski[1], E. Korbut[1], Z. Sliwowski[1], G. Ginter[1], J.L. Wallace[3], M. Magierowski[1]** ([1]Department of Physiology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Pathomorphology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [3]Department of Physiology and Pharmacology, University of Calgary, Calgary, Canada).

S12.P2 OPIOID AND CHOLINERGIC RECEPTORS INTERACTION IN RAT INTESTINE. **K. Jaszcza, K. Pierzchala-Koziec** (Department of Animal Physiology and Endocrinology, University of Agriculture, Krakow, Poland).

S12.P3 SILVER NANOPARTICLES AS DRUG DELIVERY PLATFORMS IN EXPERIMENTAL MODEL OF PERIODONTITIS. **K.P. Steckiewicz, I. Inkielewicz-Stepniak** (Chair and Department of Pharmaceutical Pathophysiology, Medical University of Gdansk, Gdansk, Poland).

S12.P4 THE EFFECT OF INCREASED AND DECREASED H_2S BIOAVAILABILITY ON THE DEVELOPMENT OF BARRETT'S METAPLASIA. **E. Korbut[1], D. Wojcik[1], K. Magierowska[1], V. Janmaat[2], M. Wierdak[1], T. Brzozowski[1], M. Szetela[1], M. Whiteman[3], M. Magierowski[1]** ([1]Department of Physiology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Gastroenterology and Hepatology, Erasmus University Medical Center, Rotterdam, Netherlands, [3]University of Exeter, Exeter, The United Kingdom).

S12.P5 THE EFFECT OF CARBON MONOXIDE (CO) RELEASED FROM PHARMACOLOGICAL DONORS ON THE DEVELOPMENT OF BARRETT'S ESOPHAGUS. **K. Krukowska[1], D. Bakalarz[1,2], D. Wojcik[1], M. Wierdak[1], K. Magierowska[1], E. Korbut[1], A. Danielak[1], T. Brzozowski[1], M. Magierowski[1]** ([1]Department of Physiology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Forensic Toxicology, Institute of Forensic Research, Krakow, Poland).

S12.P6 MODULATION OF MITOCHONDRIAL ACTIVITY BY HYDROGEN SULFIDE-RELEASING AP-39 IN GASTROINTESTINAL PHYSIOLOGY AND PHARMACOLOGY. **K. Magierowska[1], D. Wojcik[1], D. Bakalarz[1,2], E. Korbut[1], Z. Sliwowski[1], S. Kwiecien[1], J. Cieszkowski[1], T. Brzozowski[1], M. Szetela[1], M. Whiteman[4], M. Magierowski[1]** ([1]Department of Physiology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Forensic Toxicology, Institute of Forensic Research, Krakow, Poland, [3]University of Exeter, Exeter, The United Kingdom).

S12.P7 OPERATION OF TOTAL COLONIC AND SMALL BOWEL AGANGLIONOSIS (TCSA). **O. Dubarek[1], B. Filipiak[1], A. Noga[1], J. Tyrchniewicz[1]** ([1]Scientific Circle, Pediatric Surgery, Medical University, Zielona Gora, Poland).

S12.P8 INTESTINAL ALKALINE PHOSPHATASE ATTENUATES THE EXACERBATION OF MURINE COLITIS IN VOLUNTARY EXERCISING OBESE MICE. INVOLVEMENT OF INTESTINAL MICROBIOTA, OXIDATIVE STRESS AND CYTOKINES. **D. Wojcik[1], M. Hubalewska-Mazgaj[1], M. Surmiak[1], Z. Sliwowski[1], A. Wojcik[1], S. Kwiecien[1], A. Mazur-Bialy[2], J. Bilski[2], T. Brzozowski[1]** ([1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Ergonomics and Exercise Physiology, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland).

S12.P9 SPEXIN AS A MODULATOR OF HEPATOCYTE METABOLISM - *IN VITRO* STUDY. **P.A Kolodziejski[1], M. Wojciechowska[2], N. Leciejewska[1], M. Sassek[1], L. Nogowski[1], K.W. Nowak[1], H. Krauss[3], E. Malek[4], K. Mielnik[1], E. Pruszynska-Oszmalek** ([1]Department of Animal Physiology, Biochemistry and Biostructure, Poznan University of Life Sciences, Poznan, Poland, [2]Department of Mother and Child Health, Poznan University of Medical Sciences, Poznan, Poland, [3]Department of Medicine, the President Stanislaw Wojciechowski State University of Applied Sciences in Kalisz, Kalisz, Poland, [4]Department of Preclinical Sciences and Infectious Diseases, Poznan University of Life Sciences, Poznan, Poland).

S12.P10 THE NEW SYNTHETIC OXIDOVANADIUM(IV) COMPLEX WITH PYRIDINE DERIVATIVE'S DISRUPTS MITOCHONDRIAL MEMBRANE POTENTIAL AND INDUCES APOPTOSIS IN PANCREATIC CANCER CELLS. **S. Kowalski[1], I. Inkielewicz-Stepniak[1]** ([1]Medical University of Gdansk, Department of Pharmaceutical Pathophysiology, Gdansk, Poland).

S12.P11 IMBALANCED DIET DURING PREGNANCY AFFECT GASTROINTESTINAL EXPRESSION OF THE ENZYMES INVOLVED IN ENDOGENOUS HYDROGEN SULFIDE (H_2S) BIOSYNTHESIS. **U. Glowacka[1], K.G. Gawlinska[2], D. Gawlinski[2], M. Szetela[1], T. Brzozowski[1], M. Filip[2], M. Magierowski[1]** ([1]Department of Physiology, Faculty of Madicine, Jagiellonian University Medical College, Krakow, Poland, [2]Maj Institute of Pharmacology Polish Academy of Sciences, Department of Drug Addiction Pharmacology, Krakow, Poland).

S12.P12 INFLUENCE OF THE IONIC AND ORGANIC COMPOSITION OF MICROELEMENTS ON THE PRESENCE OF HELICOBACTER PYLORI IN TAP WATER EVIDENCE FROM CRACOW. **A. Targosz[1], M. Plonka[1], W. Reczynski[2], M. Jakubowska[2], A. Ptak-Belowska[1], U. Szczyrk[1], M. Strzalka[1], T. Brzozowski** ([1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Analytical Chemistry, Faculty of Material Science and Ceramic, University of Science and Technology, Krakow, Poland).

S12.P13 ADMINISTRATION OF RIVAROXABAN IN THE COURSE OF ISCHEMIA/REPERFUSION-INDUCED ACUTE PANCREATATIS IN RATS ACCELERATES THE RECOVERY. **M. Maraj[1], P. Ceranowicz[1], W. Macyk[2], J. Cieszkowski[1], G. Ginter[1], B. Kusnierz-Cabala[3], K. Galazka[4], A. Stempniewicz[1], Z. Warzecha[1]** ([1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Inorganic Chemistry, Faculty of Chemistry, Jagiellonian University, Krakow, Poland, [3]Department of Diagnostics, Chair of Clinical Biochemistry, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland, [4]Department of Pathomorphology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland).

S12.L1

ROLE OF MICROBIOTA-BRAIN-GUT AXIS IN PHYSIOLOGY AND PATHOPHYSIOLOGY OF GASTROINTESTINAL TRACT

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Brain-gut axis (BGA) represents the bidirectional interaction between the central nervous system (CNS), enteric nervous system (ENS) and the gut. In the recent years, numerous studies have shown the importance of intestinal microbiota in the modulation of BGA. Multiple direct and indirect pathways exist through which the gut microbiota can modulate BGA. They include endocrine, immune (cytokines) and neural pathways. In addition, gut microbes produce metabolites (short chain fatty acids) or neurotransmitters (γ-aminobutyric acid-GABA; noradrenaline or dopamine) that may modulate the BGA. The dysfunction of BGA plays a central role in the functional and inflammatory disorders of gastrointestinal tract (irritable bowel disease, inflammatory bowel disease). The microbiota-based approach for treatment of these disorders includes the use of special diet (low FODMAP), prebiotics, probiotics, synbiotics and fecal microbiota transplantation (FMT). In the animal studies, the use of microbiota-based therapy (symbiotic) significantly ameliorated the negative effect of stress on microbiota-brain-gut-axis. In the clinical setting, studies on probiotics, including strains of Lactobacillus or Bifidobacterium have shown to improve symptoms severity in patients with IBS and IBD. Clinical studies on FMT remain limited and show contradictory results.

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S12.L2

LIPIDS AND INFLAMMATORY BOWEL DISEASES - FRIENDS OR FOES?

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Lipids and free fatty acids (FFAs) in particular have recently attracted much attention as possible modulators of the inflammatory state. In this context, novel findings (own and from literature) on FFAs actions through FFA receptors (FFARs) and FFAR-independent will be shared. A particular focus will be made on the translational aspect of the anti- and pro-inflammatory effect of selected FFAR ligands, especially in inflammatory bowel disease.

Acknowledgements: This work was supported by the Foundation for Polish Science (POIR.04.04.00-00-420C/17-00 to JF) and by the Medical University of Lodz (503/1-156-04/503-11-001-19 to JF).

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S12.L3

THE INTERPLAY BETWEEN ENDOGENOUS GASEOUS MEDIATORS, CARBON MONOXIDE AND HYDROGEN SULFIDE IN PHYSIOLOGY AND PATHOPHYSIOLOGY OF GASTROINTESTINAL TRACT

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Endogenous gaseous mediators, carbon monoxide (CO) and hydrogen sulfide (H_2S) were reported to be the key components of gastrointestinal (GI) mucosa and to be involved in the maintenance of its integrity. CO and H_2S are produced by the enzymatic activity of heme oxygenase (HMOX) and cystathionine-γ-lyase (CTH) or cystathionine-β-synthase (CBS), respectively. Our studies reported that these molecules prevent gastric mucosa against the damage induced by the exposure to ischemia/reperfusion, stress or by the treatment with non-steroidal anti-inflammatory drugs (NSAIDs). CO- and H_2S-releasing pharmacological tools were also shown in our studies to accelerate gastric ulcer healing. Interestingly, H_2S-releasing derivatives of NSAIDs were reported to exert increased GI-safety as compared with the parent drugs. Additionally, we have observed that chronic treatment with H_2S-releasing or CO-releasing prodrugs prevent esophageal mucosa against the development of Barrett's metaplasia in experimental *in vivo* and *in vitro* models of gastroesophageal reflux disease (GERD). Importantly, among many complex molecular pathways being involved in gaseous mediators-mediated beneficial effects within GI tract, we reported that gastroprotective and therapeutic activity of H_2S is dependent on endogenous CO biosynthesis. To summarize, in majority of the investigated and above-mentioned GI pathologies we have observed the cross-talk between these gaseous molecules. Altogether, H_2S and CO seem to be the key targets for the further development of GI physiology, pathophysiology and pharmacology.

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S12.L4

ADMINISTRATION OF OBESTATIN ACCELERATES THE HEALING OF LINGUAL ULCERS IN RATS

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There are numerous strategies for the prevention or treatment of oral mucositis. However, their effectiveness is limited and does not correspond to expectations. Recent studies have shown that obestatin exhibits protective effect and accelerates the healing of gastrointestinal mucosa. The aim of present study was to examine the influence of obestatin administration on oral ulcers in rats. Lingual ulcers were induced by the use of acetic acid. Rats were treated intraperitoneally twice a day with saline or obestatin (4, 8 or 16 nmol/kg/dose) for six days. Study determined: oral mucosa morphology, cell proliferation, mucosal blood flow and mucosal pro-inflammatory interleukin-1β level (IL-1β). In animals with intact salivary glands without induction of oral ulcers, treatment with obestatin was without any effect. Obestatin administration in rats with lingual ulcers increased healing rate of these ulcers. Obestatin given at the dose of 8 or 16 nmol/kg/dose caused the strongest and similar therapeutic effect. This result was associated by a significant increase in blood flow and cell proliferation in gingival mucosa, as well as by a significant decrease in IL-1β level. We found that obestatin accelerated the healing of lingual ulcers in rats. This therapeutic effect was well-correlated with an increase in blood flow and cell proliferation in oral mucosa, as well as decrease of pro-inflammatory IL-1β level. Obestatin is potentially useful candidate for the prevention and treatment of oral mucositis.

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S12.L5

ANAEROBIC PHYSICAL TRAINING PREVENT GASTRIC EMPTYING DELAY AND ALTERATION IN FOOD BEHAVIOR IN RATS DEXAMETHASONE-TREATMENT

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Dexamethasone (Dexa) can trigger side effects, such as neuromuscular, cardiovascular, and gastric motility disorders. The chronic use of dexamethasone causes insulin resistance with a consequent increase in blood glucose. In addition, dexamethasone induces gastric changes, such as gastroparesis and increased stomach size. Exercise can improve gastrointestinal disorders. However, it is not clear how exercise can modulate the side effects of using Dexa on gastric motility. In this study, we investigate the role of anaerobic physical training on gastric motility and feeding behavior of rats treated with dexamethasone. Participants were divided into Control (Ctrl), Dexamethasone (Dexa), and Anaerobic Physical Training + Dexamethasone (AFTDexa) groups. The anaerobic physical training (AFT) protocol described by Krug *et al*., in *Muscle and Nerve* 2016. Initially, the rats went through an adaptation period of 5 days, where they made 4 climbs on a vertical ladder (110 cm high and 80° inclined), with a load corresponding to 30% body weight. Anaerobic physical training was performed 5 days/week of climbs on a vertical ladder (with an intensity of 8 × 50% to 100% of the maximum overload/8 weeks). At the end of the AFT or control, the rats received Dexamethasone (1 mg/kg, i.p /10 consecutive days). In the end, we evaluated anthropometric parameters and food behavior, heart rate, and gastric emptying in all groups. We observed a significant decrease ($p < 0.05$) in body weight and food consumption in the Dexa and AFTDexa groups compared to the control (–30.13 ± 10.32 and 24.22 ± 11.77 vs. 32.32 ± 8.03 g). Dexa treatment promoted significant tachycardia ($p < 0.05$) and a decrease ($p < 0.05$) in the r-r' interval. The exercise was able to significantly prevent ($p < 0.05$) cardiovascular effects. The Dexa group showed a significant decrease ($p < 0.05$) in gastric emptying of solids compared to the control group (24.58 ± 4.19 vs. 64.59 ± 6.16%). On the other hand, AFTDexa group, we observed that anaerobic physical training prevented ($p < 0.05$) the decrease in gastric emptying compared to Dexa (53.11 ± 8.33 vs. 24.58 ± 4.19%). Conclusion: the chronic use of Dexa causes tachycardia, decreased food consumption, and decreased gastric emptying. Anaerobic physical training modulates cardiovascular parameters, improving tachycardia. In addition, exercise prevented dysmotility induced by dexamethasone.

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S12.L6

PROTECTIVE ADIPONECTIN ACTION AGAINST EXPERIMENTAL MUCOSAL DAMAGE IN THE GASTROINTESTINAL TRACT

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Adiponectin is adipokine, exhibiting beneficial metabolic action through lipids and carbohydrates metabolism stimulation with accompanied anti-inflammatory action. We have established the role of adiponectin in healing of gastric lesions induced by ischemia - reperfusion (I/R) and TNBS-induced large bowel damage. The ischemia-reperfusion-induced acute damage exhibits a serious clinical problem. However the participation of reactive oxygen species (ROS) production, lipid peroxidation metabolites and involvement of sensory neurons, releasing NO, to the potential gastroprotective action of adiponectin remains unknown. We planned to determine the interplay between capsaicin-sensitive afferent nerves, NO/NOS system, lipid peroxidation products and the expression of proinflammatory and antioxidative factors in gastroprotective action of adiponectin against gastric I/R. Experiments were caried out on male Wistar rats and the area of gastric lesions was measured by planimetry. Colorimetric assays were employed to measure gastric mucosal levels of malondialdehyde (MDA) and 4-hydroxynonenal (4-HNE). High doses of capsaicin were administered to break sensory nerves. In separate group of animals with gastric fistula gastric acid production was determined. Adiponectin significantly reduced the gastric lesions induced by I/R or TNBS and this effect is accompanied by increase of gastric blood flow (GBF). Blockade of NO-synthase with L-NNA (20 mg/kg i.p.) reversed these effects, while additional application of L-arginine, added to L-NNA, restored the protective effect of adiponectin. Capsaicin denervation also impeded beneficial action of adiponectin in I/R model, restored by intraperitonel administration of CGRP, combined with this peptide. Adiponectin dose-dependently decreased gastric I/R lesions, as well as gastric acid secretion, the expression of mRNA for proinflammatory cytokines and MDA plus 4-HNE content while significantly increasing accompanied rise in gastrin, in I/R model. We concluded, that adiponectin, administered intravenously, exerted protective effect against ischemia/reperfusion-induced gastric lesions (I/R) and TNBS-induced large bowel lesions, through mechanism involving decrease of lipid peroxidation (MDA+4-HNE), gastric acid secretion, as well as *via* endogenous NO production and action capsaicin-sensitive afferent nerves.

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S12.L7

TIME-DEPENDENT MODULATING EFFECT OF SYSTEMIC INFLAMMATION ON THE SOMATOTROPIC AXIS SIGNAL TRANSDUCTION

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Systemic inflammation has a broad impact on the activity of neuroendocrine axes, including the somatotropic part (SA) of the hypothalamic-pituitary-somatotropic axis. So far, it was found that systemic inflammation inhibits the SA signal transduction inducing resistance to growth hormone (GH) - GHres. However, the direct mechanism of the GHres induction is still not fully elucidated. The GHres is characterized by an increased level of GH secretion, decreased level of IGF-1, and a lack of the physiological response to the exogenous GH administration. GHres is accompanied by a decreased GH receptor (*GHR*) and increased the suppressor of cytokine signaling 3 (*SOCS3*) expression. Moreover, many authors point to the critical role of the fibroblast growth factor 21 (FGF21), positively correlating with the GH level and negatively with the IGF-1. This study aimed to determine the SA signal transduction disturbances caused by systemic inflammation and whether there is a time-dependent relationship between the expression of genes responsible for the GHres development and the duration of inflammation. The experiment was conducted on 36 blackface ewes randomly divided into three groups that differ in time from the administration of lipopolysaccharide (LPS, 400 ng/kg) to euthanasia and liver tissue collection: 1.5, 3 and 9 h. The increased GH serum concentration was found 45 min after LPS injection and was sustained for the next 3 h and 45 min. Moreover, fast changes in *IL1β*, *TNFα*, and *IL6* gene expression in response to the LPS were determined. Increased *SOCS3*, *IGF-1,* and decreased *STAT5B* and *FGF21* expression in the 1.5 h group was observed. After 3 h, *GHR* and klotho beta (*KLB*) expression started to decline, while *IGF1* and *FGF21* equaled with the control group. After 9 h, *IGF1*, *GHR*, *STAT5B*, *IGF1*, and *KLB* expression decreased while *FGF21* increased markedly. The obtained results suggest the occurrence of inflammation-induced GHres on the level of the liver. In the present study, the role of FGF21 in evoking GHres seems marginal due to the inhibited signal transduction of FGF21 in the liver, which was indicated by changes in *KLB*, FGF21 cofactor, gene expression. A decrease in *STAT5B* expression combined with increased *SOCS3* mRNA level after 1.5 h may suggest this or another post-receptor mechanism of GH signal transduction inhibition in the initial phase of inflammation, which after 3 hours was strengthened by the decreased GHR expression.

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S12.L8

HELICOBACTER PYLORI INFECTION TRIGGERS ACTIVATION OF HUMAN FIBROBLASTS. A NEW TARGET OF GASTRIC CARCINOGENESIS?

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Gastric cancer (GC) remains the fourth most common cause of cancer-related death worldwide with 90% of all stomach tumors being malignant. Despite of the anti-GC therapies patients still suffer from cancer recurrence and metastasis due to the heterogeneity, high invasiveness, rapid proliferation and activity of anti-apoptotic systems in tumor cells resulting Molecular mechanisms leading to GC development are attributed to gastric infection with highly invasive bacteria *Helicobacter pylori* (*Hp*), however, the participation of *Hp*-infected gastric fibroblasts in pathogenesis of GC remains poorly understood. Herein, we explored the possibility that human gastric fibroblasts may constitute the direct target for *Hp* infection. Incubation of *Hp* with fibroblasts increased expression mRNA for TLR2,4, STAT3 and NFκB (relA) resulting in $Snail^{+}Twist^{+}$phenotype. Human *Hp*-activated gastric fibroblasts (*Hp*-AGFs) possessed cancer-associated fibroblasts (CAF) characteristics. Although control human fibroblasts were initially α-SMA positive, α-SMA became incorporated into stress fibers following *Hp*-infection and this effect was mimicked by co-incubation with TGFβ (5 ng/mL). TGFβ signaling inhibition by SB-431542 (ALK5/TGFβ type I receptor inhibitor, 10 μM/L) diminished expression of mRNA for most markers of fibroblast activation. The fast releasing hydrogen sulfide (H_2S) donor, NaHS downregulated pro-inflammatory pathway components: TLR2 and 4, STAT3 and NFκB (p65) in human *Hp*-AGFs (50 μM) and reduced expression Twist and Zeb but not that of Snail. We conclude that 1) *Hp* can activate human fibroblasts, and 2) H_2S donors can attenuate expression of CAF markers, thus deserving attention for its anti-inflammatory action in GC.

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S12.P1

GASTROINTESTINAL (GI) SAFETY AND EFFICACY OF NOVEL HYDROGEN SULFIDE-RELEASING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

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Non-steroidal anti-inflammatory drugs (NSAIDs) represent one of the most commonly prescribed classes of drugs and play an important role in the therapy of numerous inflammatory diseases such as rheumatoid arthritis. However, these compounds are also known to evoke a range of gastrointestinal (GI) adverse effects including bleeding, hemorrhage and even perforation, which significantly limit their clinical implementation. Proton pump inhibitors (PPIs) are currently recommended as a co-therapy aiming at reducing NSAIDs-induced gastric damage. Nevertheless, they were not only shown to be ineffective in decreasing intestinal injury evoked by NSAIDs, but also to exacerbate it, possibly due to the alterations in intestinal microbiome profile (e.g. small intestinal bacterial overgrowth (SIBO)). On the other hand, hydrogen sulfide (H_2S) has been recognized as an anti-inflammatory, anti-oxidative and vasodilatory endogenous messenger contributing to GI protection. Additionally, H_2S released from chemical donors has been shown to protect gastric mucosa against the damage induced by ethanol, ischemia/reperfusion and NSAIDs. Based on these promising results, novel H_2S-releasing NSAIDs have been developed with improved anti-inflammatory activity and reduced GI-toxicity. We have demostrated in experimental animal models that H_2S-releasing derivatives of acetylsalicylic acid (ATB-340) or ketoprofen (ATB-352) did not affect ulcer healing and significantly reduced gastric and intestinal damage score as compared to classic aspirin or ketoprofen. Furthermore, ketoprofen combined with omeprazole (PPI) decreased GI damage down to the level of ATB-352 applied alone. Importantly, ketoprofen, but not ATB-352, administration was followed by significant alterations in intestinal microbiota, suggesting that GI safety of ATB-352 may be due to lower impact on intestinal microbiome profile. Therefore, novel H_2S-releasing NSAIDs including ATB-352 or ATB-340 should be considered as a safer alternative in future therapies of digestive system disorders.

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S12.P2

OPIOID AND CHOLINERGIC RECEPTORS INTERACTION IN RAT INTESTINE

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Enkephalins are short opioid peptides, which are also produced by the GI tract where they are formed in gastric and intestinal endocrine/nervous cells (ENS). Leu- and Met-enkephalin exist in the native, short form and total, extended proenkephalin (PENK) form. Both peptides are potent delta opioids receptor (DOR) agonists. Enterocytes and enteric nervous cells express muscarinic and cholinergic receptors as well as opioids receptors which may suggest that their interaction affects synthesis and release of many peptidergic hormones existing in GI tract. Ghrelin was found in the GI system and interaction with Met-enkephalin at the GI and CNS levels was suggested. Acetylcholine receptors (AChRs) in the gastrointestinal tract are represented by muscarinic and nicotinic receptors. Many anatomical and biochemical evidences indicate that opioidergic and cholinergic systems are co-localized and also act on the same neurons. Thus, the aim of the study was to evaluate the *in vivo* interaction of opioid and cholinergic receptors in the regulation of Met-enkephalin and ghrelin activity in the rat intestine. The experiment was carried out on male Wistar rats (n=24) kept in standard conditions with free access to feed and water. Rats were divided into 4 groups received a single (i.p.) injection of NaCl (control group) or receptor antagonists: 3 mg/kg BW of naltrexone (N group); 5 mg/kg BW of atropine (A group); and 5 mg/kg BW of hexamethonium (H group). Thirty min after receptor antagonists injection animals were euthanized, fragments of duodenum were taken for estimation of hormones concentration and for proenkephalin mRNA expression. Naltrexone decreased the native Met-enkephalin but increased PENK and ghrelin concentrations as well as PENK mRNA expression. Inhibition of muscarinic receptors (A group) also increased PENK concentration (by 72%) and PENK synthesis (by 133%) but decreased the ghrelin concentration in the duodenum (by 32%). Hexamethonium (H group) caused increase of PENK level (by 45%) and PENK mRNA expression by 75%. In summary, the present study showed strong evidence for a bidirectional link between opioid and cholinergic systems and the obtained results potentially have impact on the future research focused on delineating the relative contributions of immune, neural and endocrine pathways in the regulating of gastrointestinal milieu.

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S12.P3

SILVER NANOPARTICLES AS DRUG DELIVERY PLATFORMS IN EXPERIMENTAL MODEL OF PERIODONTITIS

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Periodontitis (PD) is inflammation of tissues surrounding the teeth, and it may be the cause of teeth loose. Currently treatment options for PD are limited thus novel therapeutic options are needed. Silver nanoparticles (AgNPs) may be interesting therapeutic agents in PD due to their synergistic anti-bacterial and anti-inflammatory properties. In this work we assessed AgNPs as drug delivery platforms in experimental model of periodontitis. AgNPs conjugated with chlorhexidine and AgNPs conjugated with metronidazole were examined. HGF1 (human gingival fibroblast), hFOB1.19 (human foetal osteoblast), RAW264.7 (murine macrophages) cell lines were used to determine anti-inflammatory properties and safety of AgNPs. MTT assay was used to determine viability of the cells, commercially available ELISA tests were used to determine levels of pro-inflammatory cytokines levels (TNF-α, IL-1β, IL-6, IL-8) and flow cytometry was used to measure reactive oxygen species and cell cycle distribution. Cytotoxicity of AgNPs depended on the type of the drug and AgNPs concentration. AgNPs conjugated with metronidazole were less toxic. In non-toxic concertation both types of AgNPs decreased production of pro-inflammatory cytokines by lipopolisacharyde stimulated murine macrophages. Also, AgNPs decreased intracellular level of metalloproteinase in human osteoblast cells, which may suggest that they will inhibit periodontal tissue degeneration. In tested concentration range AgNPs did not impact cell cycle distribution, thus it may suggest that they will not impact tissue regeneration processes. Silver nanoparticles may be safe and effective drug delivery platforms with anti-inflammatory properties to be used in periodontitis.

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S12.P4

THE EFFECT OF INCREASED AND DECREASED H_2S BIOAVAILABILITY ON THE DEVELOPMENT OF BARRETT'S METAPLASIA

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Barrett's esophagus (BE) is a pre-malignant condition characterized by the conversion of the normal esophageal squamous epithelium into metaplastic columnar epithelium. Hydrogen sulfide (H_2S), endogenously generated by cystathionine β-synthase (CBS) and cystathionine γ-lyase (CTH) contribute to the maintenance of gastrointestinal mucosa integrity. However, the role of H_2S-prodrugs in the pathogenesis of BE has not been elucidated. This study aimed to investigated the effect of chronic treatment with the slow-releasing H2S donor, GYY4137, on BE progression *in vivo* and *in vitro*. Human-derived esophageal keratinocytes (EPC2) with or without CRISPR/Cas9-induced CTH/CBS gene knock-outs (k/o) were treated with acidified bile mixture (BM), to induce clinically observed BE-like molecular profile and/or with GYY4137 (100 μM). Male Wistar rats with esophago-gastroduodenal anastomosis (EGDA) were treated i.g. for 8 weeks with vehicle, GYY4137 (0.5–50 mg/kg) or CTH inhibitor (PAG, 1–15 mg/kg). mRNA expression for BE-specific genes and proinflammatory targets was determined by real-time PCR. Serum content of 10 inflammatory-response markers and esophageal concentration of key modulators of important signaling pathways was determined by multiplex microbeads fluorescent assay. GYY4137 and CTH/CBS k/o did not affect EPC2 cell viability. BM treatment of CBS and CTH k/o EPC2 further enhanced molecular BE-specific alterations, similarly to the groups treated with PAG. In animal model, daily treatment with GYY4137 dose-dependently reversed while PAG increased BE-specific targets expression as compared with vehicle. Furthermore, we observed decreased proinflammatory markers serum concentration and altered levels of transcription factors and kinase activities (e.g. JNK, Akt, STAT3 or STAT5). We conclude that H_2S produced endogenously or released from pharmacological tools could be involved in the inhibition of BE metaplasia development and its further progression due to downregulation of dysplasia-accelerating pathway and molecular pro-inflammatory signaling.

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S12.P5

THE EFFECT OF CARBON MONOXIDE (CO) RELEASED FROM PHARMACOLOGICAL DONORS ON THE DEVELOPMENT OF BARRETT'S ESOPHAGUS

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CO (carbon monoxide) is a cellular gaseous mediator produced *via* enzymatic activity of heme oxygenase (HMOX). This molecule has been shown to exert cytoprotective effects within gastrointestinal (GI) mucosa in low concentrations. On the other hand, Barrett's esophagus (BE) predisposes GI mucosa to the development of esophageal adenocarcinoma (EAC). We aimed to evaluate if the chronic treatment with CO donors - CO releasing molecules (CORMs) affects BE development and progression base on experimental *in vitro* and *in vivo* models. Male Wistar rats with esophagogastroduodenal anastomosis (EGDA) were treated i.g. for 8 weeks with vehicle or with tricarbonyldichlororuthenium(II) dimer (CORM-2, 0.2–5.0 mg/kg). Next, the esophageal lesions/metaplasia index (ELMI) was evaluated micro- and macroscopically. Esophageal blood flow (EBF) was assessed by laser flowmetry. We determined the esophageal mRNA expression for BE-specific *KRT* genes family and for anti-inflammatory interleukin 1 receptor agonist (*IL-1RA*) and suppressor of cytokine signalling 3 (*SOCS3*) by real-time PCR. Within *in vitro* model human esophageal keratinocytes (EPC2) and human-derived EAC cell lines (OE33 and OE19) were treated for 3 days with sodium boranocarbonate (CORM-A1, 0.05–1000 μM). Cell viability was determined using thiazolyl blue tetrazolium bromide (MTT) assay. CORM-2 dose-dependently reduced the ELMI score and modulated the esophageal mRNA expression of *KRT1*, *KRT4*, *KRT8*, *KRT18* as compared to the vehicle. Moreover, CORM-2 elevated *SOCS3* and *IL1RA* expression. CORM-A1 dose-dependently inhibited EPC2 and OE19/OE33 proliferation but only in high doses (>500 μM). We conclude that CO released from its pharmacological donors might modulate BE esophagus development and its progression, possibly due to upregulation of anti-inflammatory response pathways within esophageal mucosa exposed to gastroesophageal reflux disease (GERD).

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S12.P6

MODULATION OF MITOCHONDRIAL ACTIVITY BY HYDROGEN SULFIDE-RELEASING AP-39 IN GASTROINTESTINAL PHYSIOLOGY AND PHARMACOLOGY

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Hydrogen sulfide (H_2S) is a physiological gaseous mediator, produced endogenously by L-cysteine metabolism. Interestingly, this molecule was observed to modulate mitochondrial activity. Moreover, H_2S-releasing compounds were reported to effectively maintain gastrointestinal (GI) mucosal barrier. Thus, we aimed to determine the impact of H_2S released from AP-39 on mitochondrial activity within gastric mucosa exposed to acetylsalicylic acid (ASA). Wistar rats were pretreated with vehicle, AP-39 (0.004–2.5 mg/kg i.g.) or NC-AP-39 as structural control without H_2S-releasing ability. Next, ASA was administered in a dose of 125 mg/kg i.g. Gastric damage score and gastric blood flow (GBF) were determined by planimetry, histology and laser flowmetry, respectively. Gastric mucosal mRNA expressions of annexin-A1 and TGF-β1 as well as serum concentration of TGF-β1, TGF-β2, and TGF-β3 were determined by real-time PCR or Luminex platform, respectively. PGE_2 content in gastric mucosa was determined by ELISA. Mitochondrial complex IV and V activity was determined by biochemical assays. AP-39 (0.02 mg/kg i.g.) decreased gastric lesions area induced by ASA and increased GBF level in parallel with modulation of complex IV and V activity. AP-39 maintained upregulated by ASA gastric mucosal annexin-A1 mRNA expression. AP-39 decreased serum content of TGF-β1 and TGF-β2 but did not affect decreased by ASA PGE_2 content in gastric mucosa. NC-AP-39 did not prevent gastric mucosa in tested experimental models. Taken together, we assume that direct targeting of mitochondria and modulation of mitochondrial complexes activity by H_2S released from AP-39 maintains gastric mucosal integrity. Furthermore, AP-39 seems to be promising pharmacological tool for the further studies related to the possible therapeutic role of H_2S-mediated mitochondrial activity modulation in the process of chronic gastric ulcer healing.

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S12.P7

OPERATION OF TOTAL COLONIC AND SMALL BOWEL AGANGLIONOSIS (TCSA)

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Hirschsprung disease (HD) is a birth defect characterised by the absence or malfunction of parasympathetic ganglionic cells within the distal intestine which causes gastrointestinal tract dysfunction. In the most common type, the disorder does not extend beyond the proximal part of the sigmoid colon. In the presented case, the patient admitted to our hospital shows a much less common type of disease. It exceeds beyond the entire large intestine and involves a part of the distal small intestine as well. Due to the extent of the disorder, in this type of HD, the entire segment responsible for water and electrolytes absorption is malfunctioning. That is why this form of the disease exhibits worse long-term outcomes and lower quality of life. During the procedure using a combination of Duhamel, Martin, Kalicinski methods, the patient underwent an anastomosis of the aganglionic rectum stump and the ganglionic segment of the small intestine. As the effect, there was formed the neorectum whose main function is to re-establish proper water and electrolytes absorption as well as the prevention of persistent diarrhea.

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S12.P8

INTESTINAL ALKALINE PHOSPHATASE ATTENUATES THE EXACERBATION OF MURINE COLITIS IN VOLUNTARY EXERCISING OBESE MICE. INVOLVEMENT OF INTESTINAL MICROBIOTA, OXIDATIVE STRESS AND CYTOKINES

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Inflammatory bowel diseases (IBD) are chronic inflammatory disorders of the colon and small intestine, commonly described as Crohn disease and ulcerative colitis. Most IBD patients suffer from undernutrition, but have a higher ratio of abdominal fat than healthy, lean people. Visceral fat is the main source of pro-inflammatory cytokines. Intestinal alkaline phosphatase (IAP) is considered as an important brush border enzyme that acts by dephosphorylation of bacterial LPS. Administration of IAP in conjunction with voluntary exercise has been shown led to resolution of experimental colitis, but the changes in the oxidation status of the intestinal mucosa as well as the alteration in intestinal microbiota in IAP-treated mice with colitis remain unknown. Animals fed a high-fat-diet (HFD) for 14-weeks were randomly assigned to exercise group maintained on in-cage spinning wheels (SW) for 7-weeks. Then mice were administered *i.g.* with IAP for 2-weeks followed by intrarectal administration of 2,4,6-trinitrobenzenesulfonic acid (TNBS). The macroscopic and microscopic changes in the colonic mucosa were expressed by disease activity index (DAI). The composition of intestinal microbiota was examined in stool samples by Next-Generation Sequencing (NGS) and proinflammatory markers in plasma were determined by Luminex. The intensity of colonic damage in sedentary TNBS mice was reduced when these mice had access to SW, and this effect in SW mice was potentiated by treatment with IAP. The lowest bacterial diversity was found in HFD fed mice with colitis but this effect was reversed by the combination of IAP and SW exercise. The combination of IAP administration and SW exercise reduced oxidative stress and plasma level of proinflammatory cytokines comparing to HFD sedentary mice. We conclude that the combination of IAP with voluntary exercise shows a beneficial effect on the course of experimental colitis, reducing inflammatory response, markers of oxidative stress and improving microbial diversity. Our data indicate a potential role of IAP and voluntary physical activity in the mechanism of resolution of intestinal disorders mediated by changes in colonic microbiota and attenuation of oxidative stress.

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S12.P9

SPEXIN AS A MODULATOR OF HEPATOCYTE METABOLISM - *IN VITRO* STUDY

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The Spexin is a novel highly conservative 14 amino acid peptide that was discovered in 2007 using bioinformatics methods (Mirabeau, *et al.*, *Genome Res* 2007). The biological activity of SPX is regulated via two isoforms of the galanin receptors - GALR2 and GALR3. To date, many positive effects of SPX on metabolism have been described. It was showed that SPX inhibits food intake, regulates fat tissue metabolism by effect on lipolysis and lipogenesis as well as regulates insulin secretion from pancreatic beta cells. In this study we decided to investigate the effect of SPX on hepatocyte metabolism *in vitro*. Using AML-12 and HepG2 cell lines we studied the effect of different doses of SPX on cell proliferation and viability, lipid accumulation and expression of genes involved in the development of non-alcoholic fatty liver disease (NAFLD). We noted that SPX stimulates proliferation and cell viability of AML-12 and HepG2 cells increasing phosphorylation of ERK1/2 kinases. We also noted that SPX has the inhibitory effect on lipogenesis and this effect depends on the type of fatty acids. We summarize that SPX is a strong regulator of proliferation and fat metabolism of hepatocytes.

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S12.P10

THE NEW SYNTHETIC OXIDOVANADIUM(IV) COMPLEX WITH PYRIDINE DERIVATIVE'S DISRUPTS MITOCHONDRIAL MEMBRANE POTENTIAL AND INDUCES APOPTOSIS IN PANCREATIC CANCER CELLS

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At the present time, there is a growing interest in metal-based anticancer agents. The modern bioinorganic chemistry can exploit the unique properties of metal ions by synthesis new metal complexes, which generate new conformations that can more effectively explore structure-activity relationship. It has been demonstrated that synthetic vanadium complexes exhibit many biological activities including anti-cancer properties, however, mechanisms still are not fully understood. In our research we examined the potential effects of three newly synthesized oxidovanadium(IV) complexes against pancreatic cancer cells. We measured cytotoxicity by using MTT assay, antiproliferative activity by bromodeoxyuridine assay and necrosis as well as late apoptosis by lactate dehydrogenase assay. Reactive oxygen species generation, apoptosis and mitochondrial membrane potential were determined by flow cytometry technique. Cells morphology was evaluated by using transmission electron microscope. Our results showed that oxidovanadium(IV) complexes with pyridine derivative's were cytotoxic on pancreatic cancer cells (PANC-1 and MIA PaCa2) over the concentration range of 12.5–200 μM, following 48 h incubation. Additionally, cellular mechanism of cytotoxic activity was dependent on ROS generation, induction apoptosis with simultaneous disruption of mitochondrial membrane potential. The results of our research will help to understand the cellular mechanisms of the cytotoxic activity of the vanadium complexes and will allow a more effective design structure of new vanadium-based compounds in the future.

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S12.P11

IMBALANCED DIET DURING PREGNANCY AFFECT GASTROINTESTINAL (GI) EXPRESSION OF THE ENZYMES INVOLVED IN ENDOGENOUS HYDROGEN SULFIDE (H_2S) BIOSYNTHESIS

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The placenta plays a key role in the mother-fetus relationship, ensuring fetal homeostasis by regulating the flow of nutrients. According to the theory and developmental origins of health and disease (DOHaD), exposure to the harmful environment during critical periods of development and growth can have a significant impact on the health of offspring. Unbalanced diet during pregnancy and lactation increases the predisposition of offspring to develop diseases such as obesity, metabolic syndrome, diabetes as well as mental illness and possibly to affect gastrointestinal (GI) mucosal barrier integrity. Epigenetic regulation plays an important role in the period of early embryogenesis in mammals and enables organisms to adjust gene expression and function in response to the environment. On the other hand, hydrogen sulfide (H_2S) is an endogenous gaseous mediator produced in GI tract by enzymatic activity of cystathionine-γ-lyase (CTH) or 3-mercaptopyruvate sulfurtransferase (MPST). This molecule exerts anti-inflammatory and vasodilatatory properties and its activity is important for the maintenance of gastric mucosal integrity. H_2S also regulates epigenetic processes through acetylation and methylation of histones. We investigated based on animal experimental model, the effects of the maternal high-fat (HFD), high-sugar (HCD) mixed diet (HMD; rich in carbohydrates and fats) during pregnancy and lactation on the expression of CTH and MPST within GI mucosa of offspring. We observed that HFD and HCD modulated mRNA expression for H_2S-producing enzymes in GI mucosa suggesting that possible dysregulation of physiological functions of GI mucosal barrier and its susceptibility to GI pathologies induced by imbalanced diet during pregnancy may involve altered activity of endogenous H_2S within GI tract.

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S12.P12

INFLUENCE OF THE IONIC AND ORGANIC COMPOSITION OF MICROELEMENTS ON THE PRESENCE OF HELICOBACTER PYLORI IN TAP WATER. EVIDENCE FROM CRACOW

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Although the natural niche for *H. pylori* (Hp) is the human stomach, for widespread infection to occur the organism may need to survive in the external environment. Using molecular techniques such as PCR, we traced the presence of Hp-DNA in the drinking water, indicating that this aqueous medium can act as a reservoir for this bacterium. We investigated the relationship between the twenty six selected elements including among others: total number of microorganisms at 22°C, color, pH, conductivity at 25°C, ionic and the organic composition of microelements and the presence of Hp DNA in the tested water samples. Three hundred seventy nine objects (water samples) from different municipal water distribution system from Cracow were collected. Samples of 1000 mL of water were concentrated by centrifugation and obtained pellet was resuspended in 1 ml of PBS used for DNA extraction. Water samples were subjected to PCR for the bacteria specific pathogenic cag-A gene encoding the cytotoxic protein Cag-A. VVariables were marked in accordance with polish standards (PN) and ISO. The strategy of multivariate data analysis was applied. Following algorithms were used: 1) Principal component analysis (PCA); 2) Linear discriminant analysis (LDA). The data obtained from the tests show that 212 (55.96%) objects were Hp DNA positive. LDA was built for classifying objects based on fifteen variables: color, pH, chlorides, nitrites, phosphates, chlorates, sulphates, free chlorine, sodium, magnesium, total organic carbon, trichloromethane, bromodichloromethane, dibromochloroethane, sum trihalogenometanes (ΣTMH) for which $p < 0.05$. This model correctly classified objects, i.e. 87.5% water samples. We believe that with these algorithms, we can distinguish objects with detection of DNA-Hp from those without detection of Hp-DNA- in water samples. Conclusions: the ionic and organic composition of the trace elements in the water can influence the presence of Hp-DNA. Thus, the assay of selected chemical micronutrients can indirectly indicate or sometimes predict the presence of Hp in drinking water.

S12.P13

ADMINISTRATION OF RIVAROXABAN IN THE COURSE OF ISCHEMIA/REPERFUSION-INDUCED ACUTE PANCREATATIS IN RATS ACCELERATES THE RECOVERY

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There is a close relationship between coagulation and inflammation. The aim of the study was to investigate if administration of rivaroxaban, direct Xa factor inhibitor in the coagulation cascade, alleviates the severity of ischemia-reperfusion induced acute pancreatitis in rats. AP was induced with 30 min ischemia and subsequent reperfusion in Wistar rats. Rivaroxaban in doses of 5, 20, 100 mg/kg was administered intragastrically once daily with the first dose 24 hours after the initiation of reperfusion. Histological, functional and biochemical examinations were conducted 2, 5, 9 and 14 days from AP induction. Administration of RXB in the dose of 5 and 20 mg/kg limited the morphological damage of the pancreas such as edema, vacuolization of acinar cells, necrosis or the number of hemorrhages. Also the improvement in the pancreatic blood flow was observed. It was accompanied by the reduction of pancreatic enzymes amylase and lipase. Additionally, treatment with rivaroxaban decreased the concentration of interleukin 1β in the serum, as well as the drop in the D-dimer level was recorded. Administration of rivaroxaban in the dose of 100 mg/kg led to the increased severity of damage of the pancreas and worse acute pancreatitis parameters as compared to lower doses. In some rats intestinal bleeding was observed.

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