

Turkish Society of Physiological Sciences 44th National Physiology Congress 01 – 04 November 2018, Antalya (Turkey)

Oral Communications

OC01

Methanandamide Ameliorates Mast Cell-Mediated Neurogenic Inflammation.

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Aim: Mast cell (MC) degranulation play key role in migraine pathophysiology by inducing dural neurogenic inflammation. It was reported that endocannabinoids could prevent neurogenic inflammation but related mechanisms have not yet been clarified. We aimed to investigate effects of methanandamide and cannabinoid receptors on mast cell degranulation mediated-neurogenic inflammation induced by MC secretagogue compound-48/80.

Methods: In-vivo and ex-vivo rat groups (n=7) were intraperitoneally and topically administered saline, compound-48/80 (2 mg/kg), methanandamide (20 mg/kg), cromolyn (50 mg/kg) + compound-48/80, methanandamide + compound-48/80, rimonabant (2 mg/kg) + methanandamide + compound-48/80, capsazepine (10 mg/kg) + methanandamide + compound-48/80. Neurogenic inflammation markers including calcitonin gene-related peptide (CGRP) and substance-P(SP) levels in plasma, brainstem and brain samples were measured using ELISA. Ex-vivo dural MC numbers and degranulations were determined. Data were analyzed with One-Way ANOVA.

Results: Compound-48/80 increased CGRP and SP levels in plasma, brainstem and brain (p<0.05), these increasements were prevented by cromolyn and methanandamide (p<0.05). Rimobant blocked effect of methanandamide (p<0.05) but capsazepine had no effect. Methanandamide decreased MC degranulation induced by compound-48/80 in ex-vivo group (p<0.05).

Conclusions: MC degranulation causes neurogenic inflammation by inducing CGRP and SP release in plasma, brainstem and brain. Methanandamide ameliorates neurogenic inflammation by stabilizing dural MCs, as well as by attenuating CGRP and SP release through cannabinoid-1 receptors in brainstem and brain. Endocannabinoids and their receptors may be new targets for migraine treatment. Grant-number: 2016.08.02.1095 (AIBU-BAP).

OC02

Astaxanthin's Free-Radical Scavenging Activity in an Experimental Cerulein-Induced Acute Pancreatitis

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Aim: We investigated astaxanthin (ATX)'s thereupatic effects and underlying antiinflammatory mechanisms in a cerulein-induced acute pancreatitis rat model.

Methods: After ethical approval (76.2017mar), female Wistar rats (n=18) were injected twice with cerulein (50 µg/kg/hr intraperitoneally), with an hour in between (Acute pancreatitis; AP); while control group had vehicle injections (n=6). AP rats were treated with saline, astaxanthin (ATX; 20 mg/kg), astaxanthin + Peroxisome proliferator-activated receptor (PPAR)-alpha antagonist GW6471 (ATX+GW;1 mg/kg). Vehicle, astaxanthin or astaxanthin+GW6471 (ATX+GW) were injected after the first cerulein injection. At the 7th h following the last injection, rats were sacrificed with cardiac puncture under anesthesia. The pancreas was removed and samples were stored for the determination of malondialdehyde (MDA), glutathione (GSH), superoxide dismutase (SOD) and catalase levels, myeloperoxidase activity, luminol-lucigenin chemiluminescence levels. One-Way ANOVA and post-hoc Tukey was performed to analyze data in Graphpad Prism v.7.

Results: In all AP groups GSH was reduced, MDA, MPO and luminol CL were increased (p<0.01). ATX reversed these changes (p<0.01). In contrast to ATX group, elevations in the ATX+GW were not significant. While luminol was decreased in ATX group, lucigenin, SOD, catalase remained unchanged in all groups.

Conclusions: Astaxanthin, probably due to its free-radical scavenging activity, protected pancreatic tissue.

OC03

Effects of Bmal1 on Akt Signal Pathway After Oxygen Glucose Deprivation

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Aim: Circadian rhythm plays an important role in pathophysiological processes. Bmal1 which is involved in the regulator of biological rhythm, is an important contributor to the formation of neuronal damage after brain injury. In this study, we aimed to examine the effects of Bmal1 on cellular damage mechanisms after in-vitro oxygen-glucose deprivation (OGD).

Methods: Cell survival were investigated using OGD in lentivirus mediated Bmal1 overexpression or Bmal1 silencing in N2A cells. Both groups were treated with 1µM melatonin or vehicle at the beginning of reperfusion. To determine effect of Bmal1 on intracellular signalling, targeted proteomics (IP-MS) and pathscan analysis were performed. In addition, the effects of Bmal1 on Akt signalling pathway were demonstrated using in-vitro OGD and in-vivo cerebral ischemia model.

Results: Cell survival were increased in Bmal1 overexpressing cells, while it was decreased in Bmal1 knockdown cells. It was demonstrated that Bmal1 enhanced the level of Akt, Erk-1/-2 and Bad proteins. In addition, it has been shown that Bmal1 effects on Akt signal pathway following in-vitro and in-vivo ischemia.

Conclusions: Results showed that Bmal1 increased cellular survival after ischemic injury via the Akt signal pathway. These results may contribute to the determination of new target molecules for pharmacological therapy.

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OC04

Effects of Homocysteine and Memantine on Oxidative Stress Related TRP Cation Channels in In-vitro Model of Alzheimer's Disease

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Aim: Calcium permeable, ROS-activated TRPA1, TRPM2 and TRPV1 channels are expressed in the hippocampus. The present study was designed to evaluate the possible activation and expression levels of oxidative stress-sensitive TRPA1, TRPM2 and TRPV1 channels in Alzheimer's Disease model.

Methods: Eighty healthy both genders 10-12 months old Swiss mice were sacrificed by cervical dislocation and freshly isolated hippocampal neurons divided into eight groups; Control, A β (20 μ M, 24 h), Hcy (250 μ M, 30 min), MEM (10 μ M, 24 h), A β +Hcy, A β +Hcy+MEM, A β +MEM, Hcy+MEM. Specific agonists and antagonists for TRPA1, TRPM2 and TRPV1 channels are used to determine the channel activation level. Süleyman Demirel University Local Experimental Animal Ethical Committee Protocol Number: 2016-3/2).

Results: Data were analyzed using one-way ANOVA test. The [Ca²⁺]_i concentration, apoptosis, caspase -3 and -9 activations, mitochondrial membrane depolarization and ROS production values in the neurons were higher in A β (p<0.001) and Hcy (p<0.001) groups than in the control however they were lower in the MEM (p<0.05). The values were further decreased by MEM+AP-18, MEM+CPZ and MEM+ACA treatments as compared to MEM-only (p<0.05).

Conclusions: TRPA1, TRPM2 and TRPV1 channels are involved in A β and Hcy-induced neuronal death, and modulation of these channels by MEM treatment may account for their neuroprotective activity against apoptosis, excessive ROS production, and cytosolic Ca²⁺ overload.

OC05

Effects of Calorie Restriction on miRNA Profile in Breast Cancer Mouse Model

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Aim: Calorie Restriction (CR) decreases risk of age related diseases including breast cancer. However, underlying mechanisms is not clear. The aim of this study was to determine the effects of CR on Mammary Tumor (MT) incidence rates and microRNA profile.

Methods: Total of 201 MMTV-TGF α breast cancer model female mice were enrolled into the three different groups; Ad libitum(AL), Chronic CR(CCR) and Intermittent CR(ICR). Mice were sacrificed at week 10, 49/50 and 81/82, and tissue samples were collected. Afymetrix microarray method was used to

analyze microRNA expression. Chi-square test was used to analyze MT incidence rates and grades. For miRNA data analysis ANOVA was used.

Results: Although 21.4% (12/56) and 20.4% (18/88) of AL and ICR groups, respectively developed MT, only 8.7% (5/57) of CCR group of mice developed MT. For each sample total of 3,195 miRNA was analyzed (ebayes ANOVA, n=3). Total of 13 miRNAs including miR-485-5p, miR-150-5p, and miR-709 predicted to target adiponectin and/or leptin or their receptors were significantly and differentially expressed among the dietary groups either at week 49/50 or 81/82 (>2 fold change, p<0.05).

Conclusions: These results indicate that 13 detected miRNAs especially miR-485-5p and miR-150-5p may play important roles in the preventive effects of CR in MT development.

OC06

Effects of Leptin on the Viability of MCF-7 And T47D At Different Glucose Concentrations

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Aim: Leptin is an important factor in energy homeostasis, involved in obesity and overexpressed in breast cancer with its receptor. Moreover, high glucose induces proliferation and invasion of breast cancer cells. However, effects of Leptin in glucose homeostasis not known sufficiently in breast cancer. The aim of this study was to investigate the effect of leptin on the viability of breast cancer cells cultured in different glucose concentrations.

Methods: MCF-7 and T47D breast cancer cells incubated in different glucose concentrations for 72 hours were treated with/without leptin for 1 hour and 24 hours. Apoptotic, necrotic and alive cells were analyzed by flow cytometry.

Results: 72-hour glucose incubation significantly decreased apoptosis and necrosis, while increasing viability in both cell lines in a dose-dependent manner. 1-hour leptin incubation significantly decreased viability, increased apoptosis but did not effect necrosis significantly in T47D cells incubated with 2.5mM glucose. In MCF-7 cells, 1-hour leptin incubation significantly increased necrosis but did not affect apoptosis and viability significantly. Kruskal Wallis test (P<0.0001) with Dunns multiple comparison was used for statistical analyses.

Conclusions: Leptin is more effective in low glucose levels and 1-hour incubation. Leptin induces cell death by different mechanisms in T47D and MCF-7 cells.

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OC07

Investigation of the Effects of Intermittent and Continuous Exercise Methods on Cognitive Functions, Risk Taking, Working Memory and Attention

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Aim: Regular physical activity type for healthy life and brain has become important with increased sedentary life style. We aimed to find the effects of continuous and intermittent exercise methods on cognitive functions under anaerobic threshold.

Methods: Eight(8) hightrained sportsmen performed continuous (20minutes constant power output=90% respiratory anaerobic threshold load) and intermittent (4sets/5minutes at same power load-2minutes of 50-watt loaded rest) exercise. Stroop, PASAT, BART tests were performed for cognitive functions before-after each session. Cortical levels of blood and saliva were measured for the effect of stress. Variance analysis was performed for repeated measures and the differences and interaction between the exercises were examined. Study was approved by the Ege University Clinical Research Ethics Committee.

Results: Level of difficulty perceived in continuous exercise was higher than intermittent exercise ($p<0,05$). BART results was seen that the risk taking tendency increased after continuous exercise ($p<0,05$). There was no difference between the exercises in PASAT ($p>0,05$). Stroop interference was increased after continuous exercise ($p<0,05$), but there was no significant difference after intermittent exercise compared to before.

Conclusions: In continuous exercise, deterioration of cognitive functions and increased risk tendency were observed. With these findings intermittent exercise was thought to be a more efficient method in terms of cognitive functions. This study was conducted within the scope of Ege University Scientific Research Project No. 18-TIP-039

OC08

Effects of High Intensity Interval versus Continuous Moderate Intensity Training on Post Traumatic Stress Disorder Induced Cognitive Impairment in Rats

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Aim: To compare the effects of high intensity interval training (HIIT) and moderate intensity continuous training (MICT) in PTSD- induced rats.

Methods: Following ethical approvement, female Wistar Albino rats (n=44) were divided into six groups: Sedentary (SED),

MICT, HIIT and PTSD-induced SED, MICT, and HIIT. Exercise groups were trained on treadmill for 5 days/week, 6 weeks. On the fifth week, PTSD was induced. Cognitive functions were evaluated by object recognition, anxiety levels by hole-board and elevated plus maze, and fear conditioning by passive avoidance tests. Following decapitation, brain malondialdehyde, glutathione, myeloperoxidase, and catalase, luminol and lucigenin chemiluminescence, neuronal damage was evaluated. The data was analyzed by one-way ANOVA.

Results: Increased anxiety levels in SED+PTSD were decreased in CMT+PTSD and HIIT+PTSD ($p<0.05-0.001$). Cognitive decline was alleviated in both PTSD-induced exercise groups ($p<0.05-0.01$). Luminol, lucigenin, myeloperoxidase, malondialdehyde levels and neuronal damage were increased in SED+PTSD, while the scores reversed in PTSD-induced exercise groups ($p<0.05-0.001$). The decreased glutathione and catalase were increased in both PTSD-induced exercise groups ($p<0.05-0.001$). The latency decreased in SED+PTSD ($p<0.05$). Neuronal damage was alleviated in both exercise groups.

Conclusions: PTSD-induced memory impairment was improved by both exercise protocols but mainly by HIIT via decreasing oxidative stress and anxiety levels.

OC09

The Effect of Citalopram and Thymoquinone on Reserpine-Induced Depression-Like Behaviors in Rats

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Aim: Depression; emotional, mental, behavioral, and somatic symptoms. The effects of citalopram and thymoquinone on depression-like behaviors in the study were investigated.

Methods: After approval of the Ethics Committee, Wistar-Albino rats were divided into 6 groups (n=6). Control1 (C1), Control2 (C2), Reserpine (R), Reserpine+Citalopram (R+C), Reserpine + Thymoquinone (R+T), Reserpine + Citalopram + Thymoquinone (R+C+T). Depression was done with ip 0.2 mg/kg/day Reserpine. For antidepressant effects, 10 mg/kg Thymoquinone and/or 10 mg/kg citalopram was given 30 minutes before Reserpine. Depressive/antidepressive effects were investigated by challenging swimming, tail suspension, nutrition and sucrose preference tests. Hippocampal dopamine, noradrenaline and serotonin levels were examined. Malondialdehyde, glutathione/total sulfhydryl groups (RSH), total nitric oxide (NOx), total antioxidant capacity (TAS) and total oxidant capacity (TOS) were measured in brain cortex and plasma. The results were compared to One Way Anova Tukey test. $p<0.05$ was considered significant.

Results: R+C, R+T and R+C+T groups showed antidepressant effects on behavioral test according to R group. Reserpine; increased malondialdehyde, NOx and TOS levels in brain tissue and plasma, and decreased glutathione/RSH and TAS levels ($p<0.05$). Citalopram and Thymoquinone brought these distorted values closer to control. Dopamine, noradrenaline and serotonin levels were the lowest in Reserpine and the highest in R+C+T, R+C and R+T groups, respectively ($p<0.05$).

Conclusions: Depression findings returned to normal with citalopram and thymoquinone therapy. The efficacy was determined as Citalopram+Thymoquinone, Citalopram and Thymoquinone, respectively.

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OC10

Spexin Distracts Fasted Myoelectric Activity Through Galanin-2 Receptors in Conscious Rats

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Aim: Spexin is an endogenous peptide hormone identified in submucosal layer of mouse stomach and esophagus in 2007. Although its expression in many central/peripheral tissues, there are very few studies associated with its physiological effects. The known effect of spexin in gastrointestinal tract is to increase fed motility. Aim of our study is to investigate possible role of galanin-2 and 5-HT₃ receptors in effects of spexin on fasted motility.

Methods: Eighteen male Sprague-Dawley rats (250-300 g) were anesthetized with ketamine (100 mg/kg ip). Bipolar electrodes were implanted in jejunum of rats for migrating myoelectric complex (MMC) recording that formed source of motility pattern in the small intestine in fasting state, and catheter was inserted to left jugular vein. Spexin (320 µg/kg) was intravenously infused (1 ml/hour) following recording of baseline myoelectric activity for 60 minutes. Galanin-2 receptor antagonist M871 (0.5 mg/kg) or 5-HT₃ receptor antagonist ondansetron (0.5 mg/kg) was administered intravenously 5 minutes before spexin infusion. For statistical analysis, one-way analysis of variance (ANOVA) was performed and Tukey-Kramer post-hoc test was used for multiple comparisons between groups. Our study was carried out with permission of OMÜ HADYK 2014/48.

Results: Induction of irregular spike activity of spexin was prevented by M871 ($p < 0.05$) but not ondansetron.

Conclusions: Our findings suggest that spexin changes jejunal myoelectric activity from fasted pattern to fed pattern through the galanin-2 receptors.

OC11

The Effect of Steroid Hormones on Cognitive Functions and Psychological Status in Healthy Women

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Aim: In this study, it is aimed to investigate the physiological and psychological effects of estrogen, progesterone and testosterone in women.

Methods: Following ethical commissioning, 22 healthy female volunteers aged 18-35 years were divided into three groups of follicular, ovulation and luteal according to menstrual cycles. Estrogen, progesterone and testosterone levels were determined in blood samples taken from volunteers. Depression (BECK), state anxiety (STAI1) and trait anxiety (STAI2) scales were administered to the volunteer as indicators of their psychological

status. The Selective Attention (SIGNAL), Continuous Attention (COG) and Binary Processing Skills (ICT) tests in the Vienna System were applied to determine the cognitive functions of the volunteers. Statistical analysis was calculated using the SPSS version 15.0 (SPSS Inc, USA).

Results: While estrogen was positively associated with SIGNAL, it was negatively associated with COG and IIB, estrogen was mildly depressed and positive with STAI2 but negative with STAI1. There is a negative correlation between progesterone and cognitive functions. Mild depression with progesterone and STAI1 positivity was negatively associated with STAI2. Testosterone was negative with SIGNAL and COG and positively correlated with IOP. Testosterone is negatively associated with depression and STAI1 and positive STAI2.

Conclusions: When all the data were evaluated, it was observed that sex hormones were effective on cognitive functions and emotional state.

OC12

Effects of Sleep Deprivation on Proprioception in Healthy Young Adults

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Aim: Sleep deprivation (SD) is a common condition. The effects of SD have been investigated. In this study, research of the effects of 24-hour SD on proprioception was aimed.

Methods: The approval is taken from Trakya University Ethics Committee. 21 healthy adolescent volunteers (M/F, 10/11; Mean age $\pm$ SD, 22.0 $\pm$ 1.9 year) were examined physically. They have no chronic illnesses and medications. They have healthy sleep according to Pittsburgh Sleep Quality Index. Volunteers were subjected to 24-hour SD under sedentary conditions. Proprioception measurements were performed with angle reproduction and joint position matching tests on knee, elbow and shoulder joints at 0 hour (before SD), 24 hour (after SD) and 48 hour (after recovery sleep). The measurements of pre and post-SD were compared.

Results: On knee and elbow flexion-extension and shoulder internal rotation, proprioceptive impairment is seen after SD but improvement is seen after recovery sleep. For instance, angle reproduction test of knee at baseline and at the end of SD were 2.95 $\pm$ 2.63° versus 5.43 $\pm$ 3.18° ($p < 0.001$) which returned normal values after recovery sleep (2.71 $\pm$ 1.82°, $p < 0.01$).

Conclusions: These findings show that 24-hour SD impaired proprioception in knee, elbow and shoulder joints as recovery sleep improved these impaired. The effects of SD on proprioception is first seen in this study.

OC13

Treatment of Experimental Rat Parkinson Model with Central Neuropeptide-S: Neuroprotective and Alleviative Features

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Aim: The present study was designed to test the alleviative and protective effects of central neuropeptide-S (NPS) treatment in rat experimental Parkinson's disease (PD) model.

Methods: In male Wistar rats, acute (alleviate; 10 nmol, icv, n=10) or chronic (protective; 1 nmol, icv for 7 days, n=10) NPS treatment was performed following central injection of 6-OHDA (n=10). Locomotor tests and nigral microdialysis for dopamine recovery were performed before and 7 days after 6-OHDA injection. The immunoreactivities for tyrosine hydroxylase (TH), NPS receptor (NPSR), 4-hydroxynonenal (4-HNE) and c-Fos were detected by immunohistochemistry in substantia nigra (SN) sections. Data were analyzed with ANOVA followed by Tukey posthoc test. Protocols were approved by the Animal Ethical Committee of Akdeniz University (B.30.2.AKD.0.05.07.00/103).

Results: The 6-OHDA-induced impairment in locomotor tests and decreased nigral dopamine release were improved ($p<0.05$), while the reduced number of TH-positive cells in SN was increased ($p<0.05$) only by chronic NPS treatment. Following chronic, but not acute NPS treatment, the increased immunoreactivity for 4-HNE was attenuated ($p<0.05$) in SN in which c-Fos expression was detected following NPS administration.

Conclusions: The present findings suggest the NPSR as a novel target for clinical treatment of PD.

OC14

Neuroprotective Effect of Thymoquinone through miR-204-3p in 6-Hydroxydopamine-Induced Parkinson Model

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Aim: Parkinson's disease (PD) is a common neurodegenerative disease characterized by the loss of dopaminergic neurons in the substantia nigra, corpus striatum. MicroRNAs (miRNAs) regulate post-transcriptional expression of mRNAs. miRNAs have important role in neurological diseases. In this study, we

investigated neuroprotective effect of Thymoquinone (TQ) expression profiles of miRNA in the 6-hydroxydopamine-induced Parkinson model (6-OHDA).

Methods: Male adult Wistar albino rats (200-230g, n=36) were used. The rats were randomly assigned into six groups: Groups consist of Sham, TQ (10mg/kg,p.o.), 6-OHDA, TQ (10mg/kg)+6-OHDA, TQ(20mg/kg) + 6-OHDA and TQ (50mg/kg) + 6-OHDA group. In 6-OHDA group: 4 µl 6-OHDA (5 µg/ml 6-OHDA %0,1 ascorbic acid, i.c.v) was injected bilaterally into the striatum (from Bregma AP=0 mm; ML±3.0 mm; DV=-5.0 mm). Open field and elevated plus maze tests were performed to evaluate the behaviour changes. Under anesthetized from rats striatum was removed. miRNAs analysis was performed by miRNA microarray and confirmed by real-time PCR. Rat striatums were stained with hematoxylin-eosin to determine the impact of dopaminergic lesion. One Way Anova followed by Bonferroni's post-hoc comparisons tests were used in statistical analyses ($p<0.05$).

Results: miR-204-3p upregulated in the 6-OHDA group while downregulated in the TQ (50 mg/kg)+6-OHDA group.

Conclusions: Neuroprotective effect of TQ (50 mg/kg) performs by downregulating miR-204-3p.

OC15

Depotentiation of Long-Term Potentiation is Associated With Epitope Specific Tau Hyper/Hypo Phosphorylation in the Hippocampus of Adult Rats

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Aim: It is well known that kinases and phosphatases which are involved in the induction of synaptic plasticity modulate tau phosphorylation. How depression of potentiated synaptic-strength contributes to tau phosphorylation is unclear because of the lack of experiments in which depotentiation of long-term potentiation (LTP).

Methods: In the study, field-excitatory postsynaptic potential (fEPSP) and population spike(PS) were recorded from the dentate gyrus in response to the perforant-pathway stimulation. To induce LTP, high-frequency stimulation (HFS) consisting of four trains of 100 pulses, 100-Hz (tetanization) was used, for depotentiation of LTP, low-frequency stimulation (900 pulses, 1-Hz) was applied after tetanization. In some experiments, neutral protocol (0,033Hz) was applied without induction.

Results: 1-Hz protocol was decreased fEPSP slope which was previously increased by HFS, whereas no significant change in fEPSP slope and PS amplitude was observed in neutral protocol experiments. Western-blot indicated that tau protein was hyperphosphorylated at ser416 epitope but rather hypophosphorylated at thr231 epitope in the hippocampus upon depotentiation of LTP. These changes occurred with increase in the levels of total-Tau and phosphorylated of the ERK1/2.

Conclusions: These findings indicate that forms of long-term plasticity might be related with epitope-specific tau phosphorylation and ERK1/2 activation in hippocampus. We emphasize that tau may be crucial for physiological learning.

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OC16

The Effect of Chia (*Salvia hispanica* L.) Seed in an Experimental Alzheimer's Disease Model

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Aim: Alzheimer's disease (AD) is a progressive and irreversible neurodegenerative disorder. Chia seeds have high nutritive values. The potential benefits of chia seeds in an aluminum chloride-induced experimental AD was investigated in this study. **Methods:** Intraperitoneal aluminum chloride+D-galactose (10 and 150 mg/kg/day) was administered for 21 days in Alzheimer, Pretreatment, and Treatment groups (each n=10) while saline in Control group (n=8). Chia seed [36.2% (w/w)] was blended in the chow of Pretreatment and Treatment groups, respectively during and after the disease induction. Animals were subjected to Morris' maze, open-field, elevated-plus maze, and forced-swim tests to evaluate learning&memory, depression- and anxiety-like behaviors (ethically approved #2017/4-1).

Results: AD disturbed learning&memory (p=0.01) and caused depression- (p<0.01) and anxiety-like (p=0.04) behaviors. Learning&memory was not affected in animals that consumed chia after the disease induction (p>0.05) but worsened in those that consumed during the induction (p=0.04). Chia was ineffective against anxiety-like behaviors (p>0.05). AD-related depressive behavior was improved with both pretreatment (p=0.03) and treatment (p=0.01).

Conclusions: Chia is a functional food with effects such as anti-inflammation, cardioprotection alongside its high nutritional value. Interestingly, this study demonstrated that chia may exacerbate the prognosis in AD. These results recommend careful and cautious consumption of chia in AD patients.

OC17

Effects of Chronic Modulation of Kiss1 Neurons on Catecholamine Levels in Experimental Alzheimer Disease's Model

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Aim: Kisspeptin is expressed in the brain (especially in the hypothalamus) and reported to have neuroprotective effects. We have investigated effects of kisspeptin on hippocampal catecholamine levels in experimental Alzheimer's Disease (AD) model.

Methods: AD model was induced by injection of Aβ1-42 into the Dentate Gyrus area in the female Kiss1-CreGFP mice. For pharmacogenetic manipulation of kisspeptin neurons, CRE-attached virus (AAV-Flex-hM3D (Gq) -mCherry / -hM3D (Gq)

-mCherry) was stereotactically injected into the hypothalamic arcuate nucleus. Morris Water Maze was used to evaluate AD model behavior. Clozapine-N-oxide (CNO) was injected to test animals for one month to induce chronic activation / inactivation of kisspeptin neurons. Brain microdialysis probe was used to collect cerebrospinal fluid from lateral ventricle. Seven samples were collected at 20 min intervals. Noradrenaline, dihydroxyphenylglycol, dopamine and dihydroxyphenyl acetic acid levels were determined by HPLC-ECD. Experimental procedure was approved by ethics committee.

Results: Latency to find the platform in the Aβ1-42 infused groups was significantly increased compared to the controls (p<0.05, One-way ANOVA). There was no significant change in catecholamine concentrations among groups.

Conclusions: A decrease and increase in dopamine levels were observed in the kisspeptin activation and inhibition groups, respectively, following CNO injection. Examination of kisspeptin on catecholaminergic neurotransmission in the AD model with increased numbers of mice is ongoing. This study was supported by TÜBİTAK (Project # 115S327)

OC18

Cytochrome C Oxidase Deficiency in Drosophila Dopaminergic Neurons Does Not Impair Locomotion

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Aim: Mitochondrial diseases are among the most common inherited disorders, and present with locomotion disabilities. Previously, pan-neuronal cytochrome c oxidase (COX) deficiency severely impaired locomotion abilities of adult fruit flies (*Drosophila melanogaster*). As dopaminergic neurons are affected in many locomotion disorders such as Parkinson's disease, in this study we rigorously tested whether COX deficiency in dopaminergic neurons alone affected locomotion.

Methods: We downregulated COX7a expression by expressing RNAi and Dcr-2 in targeted neurons using Gal4/UAS system. COX was downregulated in all (n=5), dopaminergic (n=28), serotonergic (n=28), or both dopaminergic and serotonergic (n=28) neurons. Dcr-2 alone was expressed in negative controls. All genotypes were subjected to negative geotaxis and lifespan assays. Statistical analyses were performed using SPSS 12 software.

Results: COX deficiency in dopaminergic, serotonergic, or dopaminergic and serotonergic neurons did not affect flies' locomotion abilities.

Conclusions: Our results show that dopaminergic and serotonergic neurons in *Drosophila* are not sensitive to COX deficiency with respect to their functions in locomotion. Further investigations are needed for understanding the basis of locomotion deficit in pan-neuronal COX deficiency.

OC19

The Effect of Serotonin Receptor Antagonist NAN-190 on Penicillin-Induced Epileptiform Activity

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Aim: NAN-190 is a potent serotonin (5-HT_{1A}) receptor antagonist. The aim of the study is to investigate the effects of NAN-190 on the penicillin-induced epileptiform activity. **Methods:** In this study, 24 adult male Wistar rats weighing 210±30 g were used. Epileptiform activity was induced by injecting 500 IU Penicillin-G potassium (intracortically). NAN-190, at doses of 1, 5 and 10 mg/kg, (intraperitoneally) were applied 30 min after penicillin. Present study was approved by the local Ethical Committee (OMU HADYK) and supported by OMU Project Office (PYO.TIP. 1904.17.018). One-way ANOVA and the post-hoc Tukey tests of SPSS were used for statistical analyzes.

Results: NAN-190, at the dose of 5 mg/kg, significantly increased the mean frequency of epileptiform activity between 120-180th min compared to control group (p<0.05) while other doses of NAN-190 did not affect it. NAN-190, at doses of 1, 5 and 10 mg/kg did not change the amplitude of the epileptiform activity.

Conclusion: In this study, intermediate dose of NAN-190 enhanced the frequency of penicillin induced epileptiform activity. Further studies are needed to elucidate the proconvulsant effect of NAN 190 on epileptic activity.

OC20

The Role of CRH2 Receptor Antagonist Astressin 2B in the Anticonvulsant Effect of Nesfatin-1 on Epileptiform Activity

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Aim: Astresin 2B is a CRH2 receptor antagonist that antagonizes the role of Nesfatin-1 in nutrient uptake. This study aimed to investigate the role of Astressin 2B in the anticonvulsant effect of Nesfatin-1 on epileptiform activity.

Methods: Total of 28 adult male Wistar rats were used in the study. Rats were anesthetized with urethane (1.25g / kg) and epileptic seizure was created with the injection of penicillin-G (500 IU, i.c.). Nesfatin-1 (i.c.v.) was administered at 50 pmol 30 minutes after a penicillin-G administration. CRH2 receptor antagonist Astressin 2B (30 µg, i.c.v.) was administered after 10 minutes was administration Nesfatin-1 (50 pmol, i.c.v.). **Results:** Nesfatin-1, significantly reduced the frequency of epileptic activity from the administrations of 50 pmol at 20 min and showed anticonvulsant activity (p<0.05). Astressin 2B alone had no effect on epileptic activity. Astressin 2B was decreased the frequency after 100 min without affecting the amplitude of epileptic activity after was administration Nesfatin-1 (p<0.05).

Conclusions: The anticonvulsant effect of Nesfatin-1 appears to be independent by Astressin 2B, unlike its role in nutrient uptake. To elucidate the precise mechanism of Nesfatin-1 in the epileptic activity, more advanced electrophysiologic and neurochemical studies are required. This study was supported by TUBITAK (315S173).

OC21

The Effects of Neonatal Caffeine Administration on Absence Epilepsy and Brain Tissue Membranes on Adult Wistar - Albino -Glaxo Rijswijk (Wag/ Rij) Rats

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Aim: There is evidence that neonatal caffeine treatment alters adenosinergic neuromodulation that may persists till adulthood. Few studies demonstrated that seizure susceptibility could be modified as a consequence of early caffeine treatment. In our study, we planned to investigate the effects of early caffeine administration on absence epilepsy and on the molecular profiles of cortical structures in WAG/Rij rats.

Methods: Caffeine treatment at a daily dose of 10 and/or 20 mg/kg were performed during postnatal day 7-11. Control rat pups received saline (1 mg/kg). In adulthood, electroencephalogram (EEG) recordings were made four hours. Then, the number and duration of SWDs (EEG seizure activity) were analyzed. In addition, structure and content of the neuronal membranes of prefrontal cortex were investigated by FTIR spectroscopy.

Results: Caffeine treatment resulted in less SWD than observed in control rats, while the mean duration of SWD increased compared to control rats. Declines in content of lipids and proteins in prefrontal cortical neuron membranes of caffeine-injected rat brain were observed.

Conclusion: From the our results, we conclude that neonatal caffeine administration is able to influence to the frequency of absence seizures in adulthood. The molecular organization of membrane lipids and proteins of cortical neurons was also affected.

OC22

The Effects of Neonatal Tactile Stimulation and Deep Touch Pressure on Absence Epilepsy and Comorbid Depression Like Behaviors in Adult Wistar-Albino-Glaxo Rijswijk (Wag/Rij) Rats

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Aim: The aim of our study was to investigate the effects of given tactile stimulation (TS) and deep touch pressure (DTP) during the critical period of development (as mimics maternal care) on depression like behaviors and EEG seizure activity in adult WAG/Rij rats.

Methods: Our study was approved by ethical committee of Kocaeli University (KOU HAYDEK 6 / 5-2016). WAG/Rij strain pups were randomly assigned to groups of TS(n=10), DTP(n=10), maternal separation(MS) (n=10) and control group(n=10). At postnatal 5 months, WAG/Rij rats in experimental and control groups were submitted to sucrose consumption test (SCT) and forced swimming test (FST) to evaluate depression-like symptoms. Number and duration of spike-wave discharges (SWDs) recorded with EEG. Results were evaluated by ANOVA and and post hoc Tukey test was applied.

Results: Neonatal TS and DTP significantly decreased the frequency and duration of SWDs in adult WAG/Rij rats (p<0,05). In the SCT, number of approaches were significantly higher in TS and DTP group (p<0,05). In the FST the immobility latency of TS and DTP group was significantly higher (p<0,05) and TS group showed significantly decreased immobility (p<0,05).

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Conclusions: Our results showed that given TS and DTP in early life are positive experiences to prevent absence epilepsy and comorbid depression in WAG/Rij rats.

OC23

The Effect of P2X7 Receptor Antagonist A-438079 On Absence Epilepsy Model of WAG/Rij Rats

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Aim: Absence epilepsy is non-convulsive epilepsy. ATP-sensitive P2X7 receptors are non-selective cation channels in the nervous system. A-438079 is a selective P2X7 receptor antagonist. In the present study, the effect of A-438079 on epileptic activity was investigated in absence epilepsy model of WAG/Rij rats.

Methods: 6-8 months aged, 21 male WAG/Rij rats were used in this study. Tripolar electrodes were placed on the animal's skulls. Basal electrocorticography (ECoG) recordings were taken, then the solvent (i.c.v.); 20 µg (i.c.v.) A-438079; 40 µg (i.c.v.) A-438079 were injected and ECoG recordings continued. The obtained data were evaluated using the Mann Withney U test followed by Bonferroni correction in SPSS15.0. The study was carried out with permission of OMU Animal Experiments Local Ethics Committee 2015/56.

Results: A-438079, at doses of 20 µg and 40 µg didn't affect the number and duration of seizures, spikes and amplitude compared to baseline ECoG recordings and solvent group ($p>0.05$).

Conclusions: Although A-438079 has anticonvulsive effect in acute epilepsy models, A-438079 was ineffective in absence epilepsy model. However, certain P2X7 antagonists were ineffective when administered alone but they showed anticonvulsive effect with other anticonvulsants such as carbamazepine in various epilepsy models. This work is supported by OMU BAP (PMO.TIP.1905.15.002).

OC24

Hypothalamic Apelin Regulates Autonomic Outflow through Inducing Cholecystokinin Release from Paraventricular Nucleus

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Aim: The aims of the present work were to test whether (i) the release of cholecystokinin (CCK) from hypothalamic paraventricular nucleus (PVN) is increased by centrally-administered or (ii) stress-induced upregulated apelin and (iii) apelin-induced hypothalamic CCK alters central autonomic signaling.

Methods: Using microdialysis, the release of CCK-8 from PVN was monitored in male Wistar rats received acute restraint stress (ARS) or intra-PVN administration of apelin-13 (30 nmol, $n=8$). Intra-PVN application of APJ receptor antagonist F13A (10 nmol, $n=8$) was performed to eliminate the apelin-induced effects. Central pretreatment of vehicle or CCK1 receptor

antagonist lorglumide (10 µg, icv, $n=4$) was performed in rats subsequently received chemical stimulation of PVN or ARS loading simultaneously with heart rate variability (HRV) recording. Protocols were approved by the Animal Ethical Committee of Akdeniz University (B.30.2.AKD.0.05.07.00/101).

Results: CCK-8 levels were increased significantly both by intra-PVN apelin-13 ($p<0.01$) and ARS loading ($p<0.05$). The ARS-induced elevation in CCK was reversed by intra-PVN preadministration of F13A. Both ARS and chemical stimulation of PVN resulted an increase in sympatho/vagal balance (LF:HF) which was attenuated by preadministration of lorglumide.

Conclusions: These data suggest that the interaction between apelin and CCK in hypothalamus contributes to the autonomic alterations of stress response.

OC25

Adult-Onset Hypothyroidism Promotes Metaplastic Inhibition of Long-term Potentiation in a Frequency-Specific Manner

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Aim: Metaplasticity, a higher-level form of synaptic plasticity, is a process that plays an important role in preserving the balance between LTP and LTD processes, and there is no study in literature on the change in metaplasticity responses in hypothyroidism. In this study, it was aimed to show changes in metaplastic responses in hypothyroid rats.

Methods: Two-months old Wistar albino male rats were used in study; control-group ($n=20$) and hypothyroid-group ($n=20$). Hypothyroidism was induced by administration of 0.05% 6-n-propyl-2-thiouracil (PTU) in drinking water for 21 days. Metaplastic responses were recorded under urethan anesthesia from dentate gyrus of rats in response to stimulation of perforant pathway. Two different low-frequency stimulation protocols (1-Hz, 900s and 5-Hz, 180s) were used before high-frequency stimulation (HFS:100-Hz, 4 times, 5 min intervals) to investigate the metaplasticity. Akt levels were analyzed by western-blot.

Results: Free-T4 levels were significantly reduced in hypothyroid rats (0.11 ± 0.05 ng/dL vs. 2.02 ± 0.23 ng/dL; $P<0.001$). Hypothyroidism caused metaplastic-LTP inhibition following 5-Hz LFS ($P<0.001$) but not 1-Hz compared with control rats ($P>0.05$). Hippocampal p-Akt levels were significantly decreased in hypothyroid group-using 5-Hz LFS compared to control-group ($P=0.039$).

Conclusions: This study demonstrates that hypothyroidism impairs metaplasticity and the reduction in p-Akt phosphorylation may mediate this disorder. This study was supported by Erciyes University Research Fund (TCD-2017-7696).

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OC26

Examination of the Effects of Chronic Agomelatine Use on Pregnancy Time in Pre-pregnancy or in Different Periods of Pregnancy

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Aim: Agomelatine is an antidepressant with melatonergic receptor agonist and receptor 5-HT_{2C} antagonist effects. Agomelatine is in category B in pregnancy. We aimed to examine the changes of the pregnancy time in rats using agomelatine in different stages of pregnancy.

Methods: Wistar Albino female rats were used in each group. Pregnant rats; Pregnant rats with chronic agomelatine before pregnancy; Pregnant rats with chronic agomelatine before pregnancy and during pregnancy; Pregnant rats with chronic agomelatine before pregnancy and during the first 2 trimesters of pregnancy; Pregnant rats with agomelatine during the whole pregnancy from the beginning; Pregnant rats with agomelatine during the first 2 trimesters of pregnancy from the beginning.

Results: When all groups were compared with the first group, it was determined that the duration of pregnancy in the third group was significantly longer ($p<0.05$); and in the other groups it was prolonged but it was not significant. According to ELISA results, estrogen, progesterone and prostoglandin-E₂ levels in the third group decreased significantly ($p<0.05$); and oxytocin level in third group decreased but it was not significant.

Conclusions: Usage of agomelatine before and during pregnancy prolongs the duration of pregnancy in rats and decreases estrogen, progesterone, prostaglandin E₂ and oxytocin levels.

OC27

Examination of the Effect of Pregnancy on Serum Apelin Level, Breed, Gender and Body Condition Score

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Aim: The Apelin hormone secreted from adipose tissue has an important role in many physiological processes such as energy balance, immune and reproductive system, cardiovascular functions. In this study, gender, body condition score (VK) on serum apelin level in sheep was aimed to investigate the effect of pregnancy.

Methods: Following the approval of the Ethics Committee (02.07.2018-2018/6), the scope of the study was selected as the

pregnant and non-pregnant sheep, male sheep belonging to the races of Akkaraman Kangal and Morkaraman with VK 2, 3, 4 score. SPSS, repeated measures tests were used in statistical evaluation of the data.

Results: The average serum apelin levels belonging to the Morkaraman race were measured in VK2, VK3, VK4 respectively in pg/ml, 0422, 0231, 0349, and in the same race, 0342, 0471, 0336 and 0.432, 0.460, 0233 respectively. The average serum apelin levels in Kangal Akkaraman race are in pg/ml, VK2, VK3, VK4 respectively 0.192, 0.162, 0180; In the pregnant sheep, 0326, 0414, 0423 and male sheep, 0432, 0460, 0233 pg/mL has been identified as.

Conclusions: Serum Apelin level differs depending on race, VK, gestational conditions and this is statistically significant ($P\leq 0.05$), while the serum apelin level between Morkaraman male sheep is not observed when it is examined for gender. Statistically significant difference was found in the race of Akkaraman Kangal ($p<0.05$).

OC28

Can Rheumatoid Arthritis Generated in Rats Be Cured By Using Leptin Receptor Antibody (Obr-Ab)?

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Aim: Rheumatoid arthritis is a systemic, autoimmune disease. Leptin has similar effects with proinflammatory cytokines. Its increase is related with arthritis severity. However, impact of removing leptin effect to the disease is not known. In this study, we examined whether blocking the leptin receptors caused a therapeutic effect and if did not, how the progress of the disease would be affected.

Methods: Study was conducted on groups of mice. To generate arthritis, collagen antibody was used. Obr-Ab (4 µg/kg) was applied everyday until the end of study, from the day arthritis was stimulated to one group and from the day arthritis symptoms were observed to another group. Severity of arthritis was observed visually and histopathologically. Levels of plasma leptin and proinflammatory cytokines were measured. Findings: Blocking the leptin receptors by Obr-Ab didn't cause a significant change in visual and histopathological scoring and didn't make significant changes in plasma leptin and proinflammatory cytokines. However, a remarkable improvement in clinical scoring was observed.

Results & Conclusions: According to study, Obr-Ab didn't prevent progress of disease. However, data were acquired that it can decrease arthritis severity. This study was conducted with ethical board approval and was supported by TÜBİTAK (114S114).

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OC29

Investigation of the Effects of L-Carnitine on Age Related Learning Changes and the Regulation of Glutamate Levels by Behavioral and Molecular Methods

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Aim: The positive effects of L-carnitine (LCAR) on age-related learning and memory changes have been reported but the role of glutamate in this effect has not been totally clarified. The aim was to investigate the effect of L-carnitine on learning and memory changes in a physiologically aged rat model and the relationship between this effect and the regulation of glutamate level in the hippocampus.

Methods: 10-month-old 40 male Wistar rats were divided into two groups: Distilled water was administered to control group (K) and LCAR (50 mg/kg/day) was given to the other group for 7 months. Rats were subjected to active avoidance and object recognition tests. Levels of glutamate transporter proteins were evaluated by Western blotting. The data was analyzed with T-test.

Results: In both active avoidance and object recognition tests, "LCAR" group had higher learning and memory performance at a statistically significant level than "K" group ($p \leq 0.05$). Hippocampal levels of EAAT1, EAAT2, EAAT3 and VGLUT2 in "LCAR" group were significantly higher than "K" group ($p \leq 0.001$). There was no significant difference at the hippocampal level of VGLUT1 between the groups.

Conclusions: L-carnitine has positive effect on aging-associated cognitive disorders and this effect is related to hippocampal levels of glutamate (Project Number: TSA-2017-2884).

OC30

Investigation of Relation Between DNA Damage and Corneal and Retinal Parameters in Patients with Type 2 Diabetes Mellitus

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Aim: Data about DNA damage in Type 2 Diabetes Mellitus (DM) are inconsistent. While some studies demonstrated increased DNA damage, others reported no change. Present study aims to investigate relationship between DNA damage and corneal and retinal parameters in Type 2 DM.

Methods: 27 patients with Type 2 DM, 20 age-sex matched controls were included. DNA damage was analyzed by comet assay from venous blood. Corneal endothelium was assessed by

specular microscopy (SM). Optical coherence tomography (OCT) was used for retinal measurements. SM parameters as CD (cell count), CV (coefficient variation), HEX (hexagonality ratio), CT (corneal thickness); OCT parameters including macular volume (MV), central thickness (CeT), central volume (CeV), nasal (NT), temporal (TT), superior (ST), inferior (IT) foveal thicknesses were assessed. Mann-Whitney U and Spearman tests were performed. Ethics Committee approval was obtained (30/01/2018, 03).

Results: In diabetes group, DNA damage parameters as tail length (TL, 52.7 ± 14.2 vs. 42.7 ± 12.3 , $p=0.017$), tail intensity (TI, 18 ± 7.9 vs. 13.1 ± 10 , $p=0.034$), tail moment (TM, 5.8 ± 3.4 vs. 3.4 ± 3.7 , $p=0.007$) were higher than controls. Moderate-high negative correlations were found between TI vs. CeT and CeV, and TM vs. CeV.

Conclusions: Genotoxicity observed in Type 2 DM may yield retinal neurodegeneration. DNA damage did not affect corneal parameters.

OC31

Gastric Mucosal Damage Induced By Ethanol Can Be Improved By Caffeic Acid

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Aim: Antioxidant and anti-inflammatory properties of caffeic acid (CA) have been reported recently. In the study, anti-ulcerative effects of CA and the pathways involved in these effects were investigated.

Methods: Protocols were approved by local ethic committee. 60min before ulcer induction with intragastric ethanol, rats were treated with either vehicle or CA (100, 250, 500 mg/kg, per oral). To elucidate the action mechanism of CA 10 mg/kg L-NAME or 1 mg/kg atropine was administered 30min before most efficient dose (250 mg/kg) CA. Rats were decapitated 60min after ethanol administration. Stomach samples were scored macroscopically and analyzed for myeloperoxidase, malondialdehyde, and glutathione levels. ANOVA test was used.

Results: Macroscopic damage scores, malondialdehyde and myeloperoxidase levels were increased while glutathione levels decreased ($p < 0.01-0.001$) with ethanol administration. Treatment with 250 mg/kg-CA reduced macroscopic scores ($p < 0.05$) and malondialdehyde levels ($p < 0.05$). Both 250 and 500 mg/kg-CA decreased myeloperoxidase activity replenished the glutathione ($p < 0.05$, $p < 0.01$, respectively). Atropine ($p < 0.05$) and L-NAME ($p < 0.001$) injections increased macroscopic scores. Atropine elevated the reduced malondialdehyde levels ($p < 0.05$) with CA treatment and L-NAME increased myeloperoxidase ($p < 0.05$) and depleted glutathione ($p < 0.05$).

Conclusions: Results show that CA ameliorates the ethanol-induced gastric mucosal damage and CA may display these effects via NO and/or cholinergic pathway.

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OC32

Ferulic Acid Has Ameliorative Effects on Inflammation and Tissue Damage Induced by Acute Pancreatitis

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Aim: Acute pancreatitis is characterized by the hyperactivation of digestion enzymes and releasing of the proinflammatory cytokines. Ferulic acid (FA) is an antioxidant hydroxycinnamic acid derivative. The antiinflammatory effects of FA was investigated on pancreatico-biliary duct ligation (PBDL) induced pancreatitis.

Methods: Wistar albino rats were used. In a group sham operation is performed and in other group PBDL is administered. Some of the PBDL group was given intragastric saline or 250 mg/kg FA or 500 mg/kg FA 30 minutes before operation and along 3 consecutive days. Blood samples are obtained at 24th, 48th, 72nd hours. At 72nd hour all rats were decapitated. Collected pancreas, lung and liver samples were scored microscopically and analyzed for myeloperoxidase activity, malondialdehyde and glutathione levels, serum tumor necrosis factor (TNF)- α , liver and pancreatic enzymes. ANOVA with were used for statistical analysis.

Results: FA treatment reduced myeloperoxidase activity and prevented the depletion of glutathione in all tissues. Malondialdehyde levels were reduced in liver and serum TNF- α , amylase, lipase, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, and total bilirubin levels decreased with both FA treatments. Additionally, FA ameliorated microscopic damage in pancreas and liver significantly.

Conclusions: Our results showed that FA has anti-inflammatory effects in acute pancreatitis.

OC33

Protective and Ameliorative Effects of Gilaburu (*Viburnum opulus* L.) Fruit Extract on Acetic Acid-Induced Colitis in Rats

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Aim: This study aimed to investigate the effects of gilaburu (*Viburnum opulus* L.,GB) fruit extract in a rat model of acetic acid (AA)-induced ulcerative colitis.

Methods: Forty Sprague-Dawley rats of both sexes were used in this study. Starting immediately after or 1 week before the colitis induction, the rats were treated with GB (100 mg/kg/d;p.o.) for 3 days following the colitis induction. The control and AA groups received saline (1ml;p.o.), whereas another group received sulfasalazine (positive control, 100 mg/kg/d;p.o.) for 3 days.

Colonic samples were taken for the biochemical assessments on the 3rd day.

Results: High damage score, elevated tissue wet weight, tissue myeloperoxidase activity, malondialdehyde, 8-hydroxy-2'-deoxyguanosine (8-OHdG), caspase-3, cytokine (tumor necrosis factor-alpha, interleukin (IL)-1beta, IL-6,-8), transforming growth factor-beta1, smad-3, matrix metalloproteinase (MMP)-9 levels and chemiluminescence values, and a pronounced decrease in antioxidant glutathione levels of the AA group were all reversed by GB treatments ($p<0.05-0.001$). 8-OHdG, IL-8 and MMP-9 levels were not changed by sulfasalazine treatment.

Conclusions: Gilaburu exerts both the antioxidant and anti-inflammatory effects against AA-induced colonic inflammation by suppressing neutrophil accumulation, inhibiting reactive oxidant generation and apoptosis, preserving endogenous glutathione, improving oxidative DNA damage and regulating inflammatory mediators, suggesting a future potential role in the treatment and prevention of ulcerative colitis. This work was supported by Marmara University Research Fund (SAG-C-YLP-200318-0099).

OC34

The Role of Cholecystokinin in the Gastroprotective Effect of Apelin Against to Ischemia/Reperfusion-Induced Injury

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Aim: Apelin is a peptide that known to increase secretion of cholecystokinin (CCK) that shows gastroprotective effects by stimulating CCKA-receptor on sensory nerves. The aim of the study was to demonstrate role of CCK in gastroprotective effect of apelin on ischemia/reperfusion (I/R)-injury.

Methods: Experimental groups (n=12 in each one) formed with adult male Wistar rats (Ethics Committee of Akdeniz University for Animal Care and Use-Protocol No:2014.12.08): 1)Control; 2)I/R; 3)Apelin+I/R; 4)Capsaicin+Apelin+I/R and 5)Lorglumide+Apelin+I/R. The injury was induced by clamping celiac artery for ischemia (30min) and removing of clamp for reperfusion (3h). Apelin-13 (2 mg/kg) and CCKA-receptor antagonist lorglumide (5 mg/kg) were administered before I/R. Capsaicin (125 mg/kg) was administrated for ablation of sensory nerves. In statistical evaluations, Kruskal-Wallis and Mann-Whitney U tests were used.

Results: In the I/R group, mucosal blood flow ($p<0.01$), PGE2 ($p<0.05$) and CGRP ($p<0.05$) were decreased; lesion index ($p<0.001$), MPO ($p<0.05$), lipid peroxidation ($p<0.01$) and plasma CCK ($p<0.001$) were increased. Apelin prevented I/R-injury and it increased CCK ($p<0.05$) and cfos ($p<0.05$) in dorsal motor nucleus and nucleus tractus solitarius. Capsaicin or lorglumide abolished the apelin's effects.

Conclusions: Capsaicin-sensitive sensory fibers activation via CCK may play role in gastroprotective effect of apelin (Akdeniz University, Scientific Research Project No:TDK-2015-593).

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OC35

Comparison of Three Common Stress Models Used in Rodents: Distinct Effects on Sympatho-Vagal Balance and Gastric Motor Functions

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Aim: Using three common stress models, this study was designed to elucidate stress-induced changes in sympatho-vagal balance and their consequences on gastric motor function.

Methods: Apart from the non-stressed (NS, n=6) group, solid gastric emptying (GE) was measured in male Wistar rats loaded with restraint stress (RS, n=6), cold-restraint stress (CRS, n=6) or water avoidance stress (WAS, n=6). Gastric motility and heart rate variability (HRV) were analyzed before and after each stressor. The ratio between low and high frequency components (LF:HF) of HRV was used assessed for sympatho-vagal balance. Data were analyzed with Kruskal Wallis followed by Mann Whitney-U test. Protocols were approved by the Animal Ethical Committee of Akdeniz University (B.30.2.AKD.0.05.07.00/88).

Results: Compared to NS rats, GE and gastric motor pattern were disturbed in all stress groups, while it was observed more prominent ($p<0.01$) in RS-loaded rats. RS and CRS loading resulted 3- and 2-fold increases in LF:HF, respectively, whereas WAS was found to be effective to a lesser degree.

Conclusions: The present data reveal that all three stressors alter sympatho-vagal balance which in turn resulted in gastric dysmotility, however, RS appears to be more suitable for the rodent studies focused on gastrointestinal motor dysfunction.

OC36

Evaluation of JAM-A (rs790056) and LFA-1 (rs8058823) Variants in Colorectal Cancer

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Aim: The aim of the present study was to evaluate the effects of junctional adhesion molecule-A (JAM-A) and an integrin group protein leukocyte function associated antigen-1 (LFA-1) containing the JAM-A binding region variants on the formation of colorectal cancer and metastasis.

Methods: 82 colorectal cancer and 67 control cases were included in the study (Ethics Committee No: 2016/675). DNA was isolated from blood samples and quantitative analyzes were performed. JAM-A and LFA-1 genotypes were determined using the Polymerase chain reaction (PCR)-Restriction fragment length polymorphism (RFLP) method. Genotypes were evaluated by Chi-square test and $p < 0.05$ was considered statistically significant.

Results: No significant difference was found in control and patient groups in the LFA-1 rs8058823 A/G variation ($p>0.05$). JAM-A rs790056 mutant CC genotype and mutant C allele in

colorectal cancer group were found higher than the control group ($p<0.05$). The risk of colorectal cancer increased about 3-fold with CC genotype ($p = 0.029$, OR:3.125, 95% CI: 1.1-8.86). The JAM-A and LFA-1 genotypes of 31 metastatic colorectal cancer patients were compared with 51 non-metastatic colorectal cancer patients and the control group and no significant difference was found ($p>0.05$).

Conclusions: JAM-A rs790056 variation might be effective in the formation of colorectal cancer.

OC37

Effect of Angiotensin II Protein Kinase C in Diabetic Rat Vascular Smooth Muscle Cells

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Aim: Protein Kinase C (PKC) is an enzyme involved in signal transduction that regulates vascular function and is reported to cause proliferation, migration and angiogenesis in vascular smooth muscle cell (VSMC). The effects of angiotensinII (AngII) and angiotensinII type1 receptor (ATR1) antagonist (olmesartan) on proliferation and PKC in healthy and diabetic rat VSMC were investigated.

Methods: This study was conducted in accordance with the decision of Cukurova University Animal Experiments Local Ethics Committee and was supported by BAP Fund. Wistar albino male rats were used. Diabetes was induced with streptozotocin in rats. Primary VSMC was cultured from thoracic aorta of healthy and diabetic rats. AngII 0.1 μ M and olmesartan 1 μ M were administered to VSMC and proliferation was assessed by MTT. PKC level was measured by ELISA from cell lysate. Data were analyzed by one-way ANOVA.

Results: AngII 0.1 μ M increased proliferation significantly in normal and diabetic VSMC ($p=0.000$). There was a tendency to decrease proliferation by AngII+olmesartan treatment in diabetic VSMC ($p=0.000$), while it decreased AngII+olmesartan proliferation in normal VSMC by AngII ($p=0.081$), ($n=6-12$). Comparing normal and diabetic groups, PKC level in diabetic group was lower than control group ($n=4$).

Conclusions: According to our study, it can be argued that role of AngII in proliferating PKC pathway in diabetic VSMC. Olmesartan may also be thought to be protective against vascular injury due to its tendency to reduce proliferation in diabetic VSMC and PKC levels.

OC38

The Role of Serum Estradiol and Myocardial Estrogen Receptors and Antioxidant System on Ischemia Reperfusion Induced Arrhythmia Due to Ageing in Female Rats

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Aim: There is contradictory information in the literature about the factors responsible for increasing the risk of acute myocardial infarctions in women after menopause. Therefore, it was aimed to research the role of estrogen and antioxidant enzymes on the ischemia-reperfusion-induced arrhythmias.

Methods: Myocardial ischemia and reperfusion were produced in 37 female rats at different ages. The arrhythmias and blood pressure during ischemia and reperfusion were recorded. Blood and ventricular myocardium tissue samples were taken from 19 female rats and used in the biochemical analysis. In myocardial tissue extracts, estradiol alpha (E α) and estradiol beta (E β) receptors, catalase and superoxide dismutase and in serum samples, 17 β estradiol level was measured by ELISA. The results were compared by using one-way analysis of variances (ANOVA).

Results: The incidence and duration of ventricular arrhythmia increased in increasing age (P<0,05). The level of serum 17 β estradiol was not affected by aging. The levels of myocardial E α and E β receptors significantly decreased in the oldest group. The activities of antioxidant enzymes were also decreased in the oldest group.

Conclusions: The results of this study indicate that decreased E α and E β receptors and antioxidant enzyme activities might be responsible for increasing arrhythmias in old age.

OC39

Does Fluoxetine Reduce Positive Inotropic Effect of Heart?

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Aim: Fluoxetine is an SSRI(selective serotonin reuptake inhibitor) antidepressant agent, often used to treat major depression, postoperative depression, sometimes obsessive compulsive disorder, bulimia. Fluoxetine helps many people recover from depression, it is known to have fewer unwanted effects than older antidepressants. The aim of present study is to investigate effect of fluoxetine on human atrium contraction.

Methods: Human atrium tissues (n=17) were taken from patients who underwent coronary bypass surgery. The patients' ages were

between 45 to 72. All tissues were placed in organ baths containing Krebs solution, thermoregulated at 37°C, aerated (95%O₂ and 5%CO₂). Changes in isometric tensions were recorded using a four channel force displacement transducer. All tissues washed for 3 hours in order to diminish the effects of anaesthetic agents. Adrenaline(10-1M) was administered in tissue baths to induce isometric contractions. Contraction with measurements were used as contraction parameters. Cumulative fluoxetine (0.01 mM, 0.1mM, 1mM, 2mM) doses were added in organ baths. The contractions were recorded accordingly. Friedman Kruskal Wallis tests were used for statistical evaluation.

Results & Conclusions: Inhibition of contractions was statistically significant by last two doses of fluoxetine (1mM, 2mM) (p<0.05). Results of study showed fluoxetine may cause negative inotropic effects at certain high doses on atrium muscle. Further studies are needed to clarify mechanism of effect of fluoxetine. These results suggest that fluoxetine may have beneficial effects on treatment of cardiovascular diseases.

OC40

Evaluation of Clinical Data and Analysis of Metabolomics Change between ST Elevation Myocardial Infarction (STEMI) and Non-ST Elevation Myocardial Infarction (NSTEMI)

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Aim: Acute Coronary Syndrome (ACS) is clinical case due to disorder in myocardial blood flow. In ACS, full blockage based ST elevation myocardial infarction (STEMI) and partial blockage based non-ST elevation myocardial infarction (NSTEMI) is developed in coronary artery. In this study, it is aimed to determine the metabolic changes between STEMI and NSTEMI with untargeted metabolomics study.

Methods: Study has been approved by the ethics committee of the medical faculty of Atatürk University. Serum samples of 20 STEMI ve 20 NSTEMI patients who treated in cardiology clinic were collected. Aliquots were extracted by acetonitrile and then analyzed via LC/Q-TOF/MS/MS that have Dual AJSESI ion mode and acetonitrile-water mobile phase mixture. Data acquisition, classification and identification were achieved by METLIN database, MATLAB 2017a-PLS Toolbox7.2 and HMDB, respectively.

Results: 203 m/z ratio were analyzed and 163 m/z ratio were filtered whose fold analysis results were higher than 1.5 (p<0.01). In accordance with the identified metabolites, D,L-valine, glycine, leucine, D,L-isoleucine, L-cysteine, succinic acid, urea ve creatinine level were observed to be relatively lower in NSTEMI with respect to STEMI.

Conclusions: Identified metabolites could be potential biomarker for separating STEMI and NSTEMI diseases. These are good sign for differences of TCA cycle and amino acid metabolism.

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OC41

Protective Effect of Edaravone on Doxorubicin-Induced Cardiotoxicity in Rats

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Aim: Doxorubicin is an antineoplastic drug that is widely used in chemotherapy but its cardiotoxicity is the most important side effect that limits the clinical use of this drug. We investigated doxorubicin treatment and the effects of edaravone on heart.

Methods: Animal Ethics Committee of Gazi Osman Paşa University (2018-HADYEK-08) approved all procedures. 28 adult male Wistar-Albino rats were randomly separated into four groups; namely control; doxorubicin; edaravone, edaravone+doxorubicin groups. Cardiotoxicity in rats was induced by doxorubicin injection (cumulative dose:18 mg/kg, intraperitoneal-i.p.) at an interval of 24 hours (h) on the 5th, 6th and 7th days. Rats receiving edaravone treatment in the doxorubicin group received edaravone (30 mg/kg/day, i.p.) for 7 days and were injected with doxorubicin(18 mg/kg, i.p.) on 5th, 6th and 7th days. On the 8th day electrocardiography (ECG) and biochemical parameters were assessed.

Results:Multiple comparisons were performed using one-way ANOVA followed by Tukey post hoc test.Doxorubicin induction caused changes in the ECG pattern, increased ST-segment amplitude, R-R interval and and QT interval, decreased P wave, QRS Complex and R wave amplitude ($p<0,05$), increase in the serum levels of cardiac injury markers (creatin kinase, BUN, CardiacTroponin T), ($p<0,05$).Edaravone treatment prevented all the parameters of DOX-induced cardiotoxicity in rats, ($p<0,05$).

Conclusions: Our data demonstrate that edaravone has cardioprotective effects on DOX-induced cardiotoxicity.

OC42

The Effect of 20-HETE on Vascular Tone on Resistance and Conduit Type Arteries of Trained Rats

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Aim: Regular physical activities affect vascular tone through many vasoactive substances at rest condition. Depending on exercise, the effect of vasoconstrictor eicosanoid 20-HETE to changes in vasoreactivity is unknown. We aimed to investigate the effect of 20-HETE on vascular tone and its possible contribution to blood pressure in trained rats.

Methods: Wistar rats were subject to swimming-exercise for 8 weeks. Blood pressure was measured from carotid artery. The direct effect of 20-HETE on vascular tone in thoracic aorta and gastrocnemius resistance arteries and its contribution to the effects of various vasoconstrictors were evaluated in organ-bath and myograph. 20-HETE levels and expression of 20-HETE-producing-enzyme CYP4A were measured in vessels.

Results: As a result of exercise, the contribution of 20-HETE on regulation of blood pressure was reduced ($p<0.01$). 20-HETE's contribution to vascular tone was decreased both directly ($p<0.001$) and caused to decrease responses to various vasoconstrictive agents in gastrocnemius vessels, this effect was

not observed in aorta. CYP4A expression and 20-HETE production were decreased in gastrocnemius vessels ($p<0.05$). **Conclusions:** Depending on exercise, the effect of 20-HETE on regulation of blood pressure and its vasoconstrictive contribution to vascular tone in gastrocnemius vessels are decreased, and these effects are associated with decrease of CYP4A protein. This study was supported by BAP (TDK-2015-311) and TUBITAK (115S001).

OC43

Evaluation of Physical Fitness and Isokinetic Test Parameters of Athletic Individuals with Amputation

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Aim: The functional condition and activities of daily living are negatively affected in the amputation. In this study, we aimed to determine the physiological effects of sports on amputation.

Methods: Our study was approved by the Istanbul University Regional Ethics Committee. 36 amputee football players' (mean age = 29.25 ± 6.3 years) body fat measurement, one-leg balance assessment, isokinetic trunk muscle strength measurement, respiratory function test and metabolic measurements were evaluated.

Results: The body fat percentage was 10.54 ± 4.9 , flexor isokinetic trunk muscle strength at the velocity of $60^\circ/\text{sec}$ is 275.09 ± 58.4 , extensor isokinetic trunk muscle strength at the velocity of $60^\circ/\text{sec}$ is 234.6 ± 51.8 , flexor isokinetic trunk muscle strength at the velocity of $90^\circ/\text{sec}$ is 271.43 ± 54.14 , extensor isokinetic trunk muscle strength at the velocity of $90^\circ/\text{sec}$ is 206.29 ± 56.8 , one-leg balance values overall 0.87 ± 0.28 , anterior-posterior stability index 0.57 ± 0.25 , medial-lateral stability index 0.52 ± 0.21 , FEV1 % 98.2 ± 12.13 , FVC % 92.63 ± 12.13 , FEV1/FVC 108.4 ± 7.2 . Athletes' resting heart rate(HR) $79.37 \pm 15.26/\text{min}$, maximum HR $166.15 \pm 25.3/\text{min}$, recovery HR $107.3 \pm 19.13/\text{min}$, targeted % HR 86 ± 11.86 , VO2max $30.96 \pm 11.05 \text{ ml/kg/min}$.

Conclusions: In this study, amputee football players' body composition, aerobic and anaerobic capacities and muscle power parameters were investigated extensively. There is a need for studies that have a higher number of participants.

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OC44

Physical Activity, Waist / Hip Ratio and Blood Parameters in Patients with Type 2 Diabetes

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Aim: It was observed that blood sugar levels of physically active diabetics were better regulated. It was proposed that there might be a relationship between physical activity and diabetes. The study investigated the effect of physical activity on blood sugar regulation in diabetics.

Methods: The hundred Patients of Ömer Halisdemir Training Hospital, who have been diagnosed with diabetes for one to five years, and do not use insulin, were included in this study, following the ethical approval. Physical activity levels were recorded by face-to-face interviews; their total metabolic equivalents (MET-minutes/week) were determined and fasting blood glucose (FBG) and HbA1c levels were examined. Statistical analyses were performed using Kolmogorov Smirnov, one way variance analysis,

Results: Individuals with sufficient activity had lower FBG and HbA1c values than less active individuals ($p < 0.05$). Based on the waist - hip ratios, the values of FBG and HbA1c of the individuals in the risk group were higher than the values of the individuals in the risk free group ($p < 0.01$).

Conclusions: The patients with higher MET had significantly lower FBG and HbA1c than the others, suggesting that physical activity is important for individuals with type 2 diabetes. The study was supported by Erciyes University (TYL-2017-2441).

OC45

Effect of Moderate to Moderate Lower or Upper Extremity Resistance Exercises on Lung Function and Quality of Life in Asthmatic Patients

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Aim: Symptoms such as shortness of breath, cough, sputum, etc. in asthmatic patients are affecting their daily lives negatively. We aimed to investigate the effects of moderate to moderate lower or upper extremity resistance exercises on pulmonary function and quality life for an average of 15-20 min.

Methods: Total 10 subjects asthma 6 volunteers. Mean age, height, weight and body mass index individuals 50.20 ± 8.69 , 1.64 ± 0.08 , 78.10 ± 19.50 and 28.88 ± 7.04 , respectively. Home exercise program was given for 1-3 sets a day, at least 3 days a week for 3 months. Pre- and post-respiratory function tests and SGRQ was done.

Results: p values before and after exercise showed mean and standard deviation (FEV1: $p = 0.09$, 2.88 ± 0.45 , FVC: $p = 0.10$, 7.16 ± 1.00 MEF: $p = 0.10$, 6.29 ± 0.90 MEF75: $p = 1.00$, 4.14 ± 0.31 MEF50: $p = 0.71$, 1.70 ± 0.16 MEF25-75: $p = 0.06$, 3.49 ± 0.21). Pre-exercise breathing questionnaire score ($p = 0.05$, 36.10 ± 3.78).

Conclusions: Exercises lung functions did not make any significant difference they were found to contribute positively quality life.

OC46

Comparison of Fat Oxidations Determined in Fat Max Intensity in Athletes and Sedentary Individuals

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Aim: Metabolic responses of sedentary individuals and recreational athletes' at highest fat oxidation intensity (Fatmax) was compared

Methods: Eleven sedentary (22.7 ± 0.6 years, BMI 25.6 ± 0.9 kg/m²) and 13 recreational athletes (21.9 ± 0.6 years, BMI 23.7 ± 0.6 kg/m²) participated in this study. Local ethical committee approval was taken. Metabolic responses were measured using indirect calorimetry and incremental exercise tests were performed on the treadmill. Normality of data was checked and independent t-test or Mann-Whitney U tests were used according to data distribution. Data were given as mean $\pm$ SEM.

Results: There were no differences in fat oxidation, heart rate, respiratory coefficient (RQ), oxygen uptake and % fat, % carbohydrate contribution to energy production in the fatmax intensity between groups. Significant differences were found only at peak oxygen uptake ($p < 0.001$) and walking speeds ($p < 0.01$) at which fatmax was obtained.

Conclusions: Although the athletes have higher $\dot{V}O_{2\max}$ values, at higher speeds they have similar fat oxidation levels as the sedentary individuals. Even though it was expected from athletes to oxidize higher levels of fat due to their increased aerobic capacity, the result of athletes might point out insufficient adaptation of one or more steps in fat oxidation pathway.

OC47

A New Human-Machine Interface: Using Hall Effect Sensor to Control Prosthetic Fingers

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Aim: Almost all commercially available mechatronic prostheses are controlled by electromyography signals. However, more robust methods are needed to control the mechatronic hand prosthesis. We propose a new method that has not been tried before to control prosthetic fingers, Hall effect sensor.

Methods: Cylindrical neodymium magnets were placed on the model parts representing the tendon of the muscles controlling the fingers of the model hand made from the wooden according to the anatomical characteristics of the human hand. Hall effect sensors were placed on the layer representing the sensor part of the hand prosthesis we placed on the model hand, on top of the magnets placed on the model tendons on each fingertip. Voltage build up along a conductor in the magnetic field (Hall voltage) is called Hall effect. Hall voltage was used to control 5 separate servo motors that controlled the prosthetic hand fingers after being processed in the Atmega32u4 microcontroller.

Results: The method we proposed provided a perfect link between the model and the prosthesis hand and provided more precise control.

Conclusion: As much as we know, the study we propose is the first study in the literature.

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Predictive Value of CC16 For Respiratory Prognosis in Occupational Gas Exposure

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Aim: Even after the cessation of exposure to chemicals, occupational respiratory disease's symptoms may not improve. Therefore, researches for predictive biomarkers are necessary. CC16 is a respiratory epithelial permeability marker. We aimed to evaluate predictive value of CC16 level for occupational exposure related respiratory diseases.

Methods: Study was conducted in an armed vehicle manufacturing plant. 43 volunteer's (31-60 age, male) respiratory parameters were followed up for two years. CC16, TNF α , hippuric acid and phenol levels determined. By using STAT/Statistic program causative relations were examined by linear regression analysis. Difference between 2016 and 2018 parameters analysed by Wilcoxon signed rank test. Project was approved by Institutional Clinical Researches Ethics Committee of Ankara University.

Results: Volunteers divided into three groups; low, normal and high CC16 level. Within the follow up period while only FEV1 and MEF25-75 (p=0,0001) values were significantly decreased in low and normal CC16 level groups, in high CC16 level group PEF (p=0,019) values decreased too. Our results didn't reveal any causative relation between CC16 levels and chemical exposure.

Conclusions: Main outcome of this study indicates that significant respiratory function changes should be expected in chemical exposed workers. Also, high CC16 levels might predict worsening of respiratory functions.

OC49

Effects of Carvacrol on Erythrocyte Deformability in Lower Extremity Ischemia Reperfusion Induced Rats

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Aim: Carvacrol has anti-oxidant, anti-inflammatory, anti-apoptotic effects. For this reason we desired to research the effects of carvacrol on rats with lower extremity ischemia.

Methods: After approval of the Ethics Committee, 18 Wistar Albino rats were used which weighs 200-250 g. They were randomly divided into 3 groups. (Control, ischemia and reperfusion (IR)), ischemia and reperfusion with 100 mg/kg carvacrol (IR-Car). Aorta was clamped from infrarenal portion in IR groups. 60 minutes of ischemia and 60 minutes of reperfusion applied. Deformability measurements were performed using erythrocyte suspensions with 5 % hematocrit in phosphate buffered saline buffer. A constant flow filtrometer was used to measure erythrocyte deformability and relative resistance was calculated. Kruskal-Wallis test was used in independent groups. Mann-Whitney U test was used when differences occurred.

Results: It was found that IR raises the relative resistance compared to control group (p<0.001). Erythrocyte deformability

index was found dramatically high in IR and IR-Car groups (p<0.001, p=0.02, respectively) Erythrocyte deformability index was significantly low after using carvacrol (p=0.017)

Conclusions: We managed to find that using carvacrol partially repairs the disrupted erythrocyte deformability. We believe that if supported with new researches, carvacrol's protective effects on IR could be shown more detailly and it is usage indications will be expanded.

OC50

Effects of Rho/Rho kinase Inhibition on Erythrocyte eNOS Enzyme Activity

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Aim: Erythrocytes constitutently produce NO(nitric oxide) under basal conditions and contribute to NO pool in the vascular system which has important roles on physiological blood flow regulation. One of the regulator of endothelial NO production is Rho kinase (ROCK) enzyme. It is not known whether this pathway has an impact of NO production in erythrocytes. The aim of this study was to investigate the possible role of Rho/ROCK pathway on NO production in erythrocytes.

Methods: Erythrocyte packed were isolated from healthy volunteers and re-suspended in Hepes solution at a hematocrit of 0.01 l/l Sampling protocols were approved by local ethical committees (24.02.2016/150). Intracellular NO and Ca²⁺ levels and endothelial nitric oxide synthase(eNOS) activation measured by flow cytometry in response to ROCK inhibitor, fasudil, in the absence and presence of NOS and PI3K/AKT inhibitors. Student-t test was used for evaluating the results. Statistical significance was p<0.05.

Results: Fasudil increased intracellular NO and eNOS inhibition reduced this response (p<0.05;p<0.05). Fasudil also enhanced Ca²⁺ and phosphorylated eNOS (peNOS) levels (p<0.01; p<0.05). However PI3K inhibitor has no effect on intracellular NO and peNOS.

Conclusions: The result of the study clearly demonstrated that inhibition of Rho/ROCK pathway enhanced NO production in erythrocytes via both intracellular Ca²⁺ and eNOS phosphorylation increment. This study supported by TUBITAK (project no:116S271)

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Effects of Ascorbic Acid on The Kidney in an Experimental Endotoxemia Model

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Aim: Renin-angiotensin system (RAS) has an important role in physiologic and pathologic conditions. This study investigated the effects of ascorbic acid (AA) on RAS in the experimental endotoxemia model induced by lipopolysaccharide (LPS) administration.

Methods: Twenty-four male Wistar rats were divided into four groups: Control, LPS (2 mg/kg, intravenous (iv)), LPS+AA (100 mg/kg AA, iv, one hour after LPS administration), AA (100

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mg/kg, iv). Mean arterial pressure (MAP) was measured. Renin, angiotensin (Ang)II, connexin (Cx) 40 and Cx43 levels were determined in blood and kidney samples. Statistical significance was calculated by one-way and two-way ANOVA followed by either Tukey's or Bonferroni's tests. This study was approved by I.U. Local Committee on Animal Research Ethics.

Results: MAP decreased in LPS group, but AA administration did not change MAP. In LPS group, renin ($p<0.001$) and AngII ($p<0.001$) increased, but Cx40 and Cx43 were similar to the control. In LPS+AA group, renin ($p<0.001$; $p<0.01$) and AngII ($p<0.001$; $p<0.01$) decreased, but Cx40 and Cx43 did not change in plasma and tissues compared to LPS group.

Conclusions: These results indicated that AA did not affect on MAP decreased with LPS, but has a role on RAS. This work was supported by I.U. Scientific Research Projects Coordination Unit. Project number: 43412.

SS52

Effects of Nootpept on Eye and Kidney in Prepubertal Rats with Streptozotocin-induced Diabetes

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Aim: Chronic complications of diabetes mellitus (DM) include retinopathy and nephropathy. Puberty is risky in DM. Nootpept has been shown to have anti-diabetic properties. We investigated the effects of noopept on eye and kidney in prepubertal DM rats.

Method: With Inonu University DHEK permission; 28 days-old, 60 male Sprague Dawley rats were divided into 6 groups randomly. i) Control, ii) DM Control, iii) Nootpept Control, iv) DM+Nootpept, v) DM+Insulin, vi) DM+Insulin+Nootpept. On postnatal day 28, diabetes was induced by 50 mg/kg streptozotocin. Intraperitoneal 0.5 mg/kg noopept, 1 unit insulin was administered for 14 days in required groups. Eye and kidney tissues were histologically evaluated. Mann-Whitney U test was used in data evaluation, $p<0.0001$ was considered statistically significant.

Results: Retina and cornea of eye were evaluated. Deterioration, increased thickness and vascular congestion in retina, vacuolisation, vascular congestion, edema and deterioration in epithelium of cornea were determined in diabetic groups. Hemorrhage, vacuolysis, cell infiltration, spillage in tubular epithelium, glomerular disorder, tubular casts and necrosis were determined in kidneys of diabetics. Disorders of eye and kidney were reduced in treated groups, particularly in noopept&insulin co-administered group.

Conclusion: Nootpept has preventive effect on diabetic eye and kidney. This study was supported by TÜBİTAK (215S629).

SS53

Teratogenic Effects of Exposure to Radiofrequency-Electromagnetic Field on Histopathological and on Hippocampal Levels of MAPKs on Rats Brain

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Aim: The aim of study was to investigate the effects of 2450MHz radiofrequency-electromagnetic field exposure on histopathological changes of brain tissue in female rats and on hippocampal levels of MAPKs(Mitogen-activated protein kinase) proteins in male rats.

Methods: 12 Wistar Albino female and 4 male rats were used in this study. They were divided into a control and three exposure groups including a male and three female rats. Exposure groups were exposed by 2450MHz EMF. 1st were exposed male but not female rats. 2nd were exposed both male and female rats. 3th were exposed female but not male rat. Exposing time was 12 hours for 30 days. At the end of 30 days all groups were fertilized. The brain of female rats were took 10% formaldehyde for histopathological evaluation. The hippocampal protein levels of male rats were measured using Western Blotting. Non-parametric t-test was used to compare groups. P-value <0.05 was considered significant.

Results: There were significant difference between the control and exposure groups in pERK level ($p<0.05$). Females exposed to EMF had irregular cortex-cellular placement and vascular dilatation in the 1st and 2nd groups compared to the control.

Conclusion: These results demonstrate that increased expression of pERK after exposed EMF may leads to learning and memory deficit. EMF may cause damage to the adult brain. Acknowledgments: ERUBAP Project #: TCD-2017-7275.

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Neuroprotective Effects of Sirt2 Inhibition In Aging

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Aim: The aim of this study was to investigate the effect of sirt2 inhibitor salermide on oxidative stress & apoptosis in aging brain.

Methods: Twenty four male Wistar rats (young: 3 months old, aged: 22 months old) were divided into following groups: Young-Control (n=6), Young-Salermide (n=6), Aged-Control (n=6), Aged-Salermide (n=6). Intraperitoneal injections of control (4% DMSO-PBS) and salermide (1mM salermide; 25 µl/100g bw) groups were maintained for 21 days. Sirt2, FoxO3a, Bcl-2, Bax and Bim expressions in cerebral cortex and hippocampus were tested by Western blotting. Sirt2 and FoxO3a protein levels were measured by a sandwich ELISA method. The ratio of total oxidant status to total antioxidant status, i.e. the oxidative stress index, was also calculated. ANOVA, LSD, Pearson's r were used for statistical analysis ($p<0.05$).

Results: Aging increased sirt2, FoxO3a and oxidative stress index, and decreased Bcl-2, Bcl-2/Bax ratio and antioxidant capacity in cortex and hippocampus. Bim in cortex and Bax in hippocampus increased with aging. Salermide administration in aged rats suppressed FoxO3a, oxidative stress and apoptosis as well as sirt2 ($p<0.05$).

Conclusions: Sirt2 inhibition may protect the aging brain against oxidative damage and neural loss. GÜ-BAP (01/2016-05) and TÜBİTAK (216S258) provided the financial support for this study